RECONCILING SUSTAINABLE DEVELOPMENT AND INDUSTRIAL COMPETITIVENESS

PUBLIC AND PRIVATE SECTOR PERSPECTIVES

Zoe Laird

Thesis Submission for the Degree of Doctor of Philosophy

Centre for Planning, Faculty of Business, Strathclyde University

2004

DECLARATION OF AUTHOR'S RIGHTS

ABSTRACT

The thesis investigates potential to reconcile sustainable development and industrial competitiveness in the public and private sectors in Scotland, presenting recommendations that will facilitate any such reconciliation, making business activity more sustainable. The thesis introduces and explores the concept of sustainable competitiveness and determines whether it has the potential to encapsulate the reconciliation of sustainable development and industrial competitiveness.

A literature review of sustainable development, competitiveness and good practice examples of their reconciliation is used to present a definition of sustainable competitiveness and set the framework for data gathering. Interviews with practitioners working on sustainable development with business and industry in the public and private sectors in Scotland offer a practical insight into current good practice. Good practice is chosen as the basis for the interviews to demonstrate what is possible and explore approaches that can create more sustainable outcomes. The interviews were conducted between 1999 and 2001. Analysis of the interviews revealed certain themes in relation to understanding and practice. The interviews are analysed using these themes to structure the findings. Approaches by public and private sectors are compared to understand the relative roles that each sector is undertaking and whether or not those activities aim to deliver sustainable development, reconcile sustainable development and competitiveness or simply re-brand existing activity.

In analysing implementation of good practice, it is important to understand what drives and supports that process. Thesis findings concentrate on what these drivers and supports are and their implementation. A sustainable development/ competitiveness matrix draws this information together both in a theoretical matrix and in one based on practice in Scotland. Finally recommendations are presented that summarise how effective drivers and supports for sustainable competitiveness can be implemented in Scotland.

SUMMARY OF CONTENTS

CONTENTS

LIST OF FIGURES, TABLES AND EXAMPLE BOXES

FIGURES

TABLES

BOXED EXAMPLES

LIST OF ACRONYMS

5EAP	Fifth Environment Action Programme
6EAP	Sixth Environment Action Programme
AGSD	Advisory Group on Sustainable Development
BAT	Best Available Technology
BCSD	Business Council for Sustainable Development
BT	British Telecommunications
CDS	Conventional Development Scenario
CFCs	Chloro Flouro Carbons
CO_2	Carbon Dioxide
CSCSS	Cabinet Sub Committee for a Sustainable Scotland
DoE	Department of the Environment
DTI	Department of Trade and Industry
EC	European Commission
EDAS	Economic Development Association Scotland
ELLD	Enterprise and Lifelong Learning Department
EMAS	Eco-Management and Audit Scheme
ESDG	Education for Sustainable Development Group
EU	European Union
EV&P	Ethics, Values and Principles
GATT	General Agreement on Trade and Tarriffs
GNP	Gross National Product
ICT	Information and Communication Technologies
IIASA	International Institute for Applied Systems Analysis
IISD	International Institute on Sustainable Development
IPCC	Intergovernmental Panel on Climate Change
IPPC	Integrated Pollution Prevention Control
LA21	Local Agenda 21
LECs	Local Enterprise Companies
LESS	Low Carbon Dioxide Emitting Energy Supply System
LPG	Liquid Petroleum Gas

NEDC	National Economic Development Council
NGOs	Non Governmental Organisations
ODS	Ozone Depleting Substances
OECD	Organisation for Co-operative Economic Development
SDT	Sustainable Development Team
SEERAD	Scottish Executive Environment and Rural Affairs Department
SEPA	Scottish Environment Protection Agency
SMEs	Small to Medium Sized Enterprises
SNH	Scottish Natural Heritage
The Executive	The Scottish Executive
The Private Sector	Business and industry
The Public Sector	Government and its local delivery agencies
TNCs	Trans National Corporations
TQM	Total Quality Management
UDV	United Distillers and Vintners
UK	United Kingdom
UKOOA	UK Offshore Oil Association
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNCTC	United Nations Centre on Transnational Corporations
UNDP	United Nations Development Programme
US$	United States Dollars
USA	United States of America
WCED	World Commission on Environment and Development
WEC	World Energy Council
W-E-T	Waste, Energy and Travel
WTO	World Trade Organisation
WWF	World Wide Fund for Nature

INTRODUCTION

Increasing awareness of environmental issues over the past 30 years has raised the level of debate about how environmental problems can be resolved. Environmental problems have come to be understood in the context of social and economic issues and efforts to understand the links between all these issues led to the increased use of term sustainable development from 1984 onwards, following the publication of Our Common Future (WCED, 1984). One of the strongest arguments against sustainable development implementation comes from the business and industry sector. This sector has argued that efforts to mitigate the impact of their activity on the environment or pursue sustainable development are anti-competitive.

Recognising that there is potential to resolve the apparent conflict of interests between competitiveness and sustainable development and recognising that resolution of this conflict could mean significant improvements to the global situations outlined in Our Common Future (WCED, 1984) creates a demand to examine this area. The thesis, using from data collected from 1999 to 2001, investigates potential to reconcile sustainable development and industrial competitiveness in the public and private sectors in Scotland. It presents recommendations that could facilitate reconciliation and make business sustainable.

The Introduction explains the background to the global situation in terms of sustainable development and describes the thesis objective in more detail. This chapter also describes the methodology used in preparing the thesis and outlines the chapters to follow.

Background: The State of the World, Unsustainable Development?

There are two particular features of social structure, which contribute to the increasing pressures and challenges for socio-economic development and environmental quality. These are population growth and economic growth. High levels of population growth and economic growth create high levels of consumption. Economic growth, and the consequent levels of consumption, are inequitable and the inequities are characteristic of both absolute and relative poverty. Both consumption and poverty have a negative effect on environmental quality. In order to improve the state of the world and make it more sustainable, a process of change is needed. The role of business and industry in relation to economic growth, consumption, poverty and environmental conditions is significant and there are various strategies that business and industry can employ through a process of change that can improve the state of the world. Each of these issues is described in more detail in the following subsections.

Population Growth and Economic Growth

Global population growth continues despite a near steady population level having been reached in the western world. Current estimates predict that by 2050 the global population will have increased from the current 6.4 billion to 9.4 billion with potential to even out at around 11 billion (UN, 1997). There are other higher and lower estimates but all emphasise significant levels of growth. Most of this growth will take place in developing countries.

The world economy is also growing at an increasing rate. For example, its annual output has grown from $6.5 trillion in 1950 to $31 trillion dollars in 1990 and then to

$42 trillion in 2000 (UN, 1997). In 2000, the growth of the world economy was 4.7%, the highest annual rate of increase in the last decade. This growth in the economy has resulted in two trends. Firstly in many countries it has made people wealthier. In Figure 1 below it can be seen that although much of the growth is in North America and Western Europe, growth in the per capita income of the other regions in the world has also taken place. Projections suggest that this growth will continue throughout all regions of the world although the most significant growth is in the developed countries. For example by 2025 per capita income in the developed countries is predicted to double to US$40,000 while in the developing countries average per capita income is predicted to treble to around US$5,000 (UN, 1997).

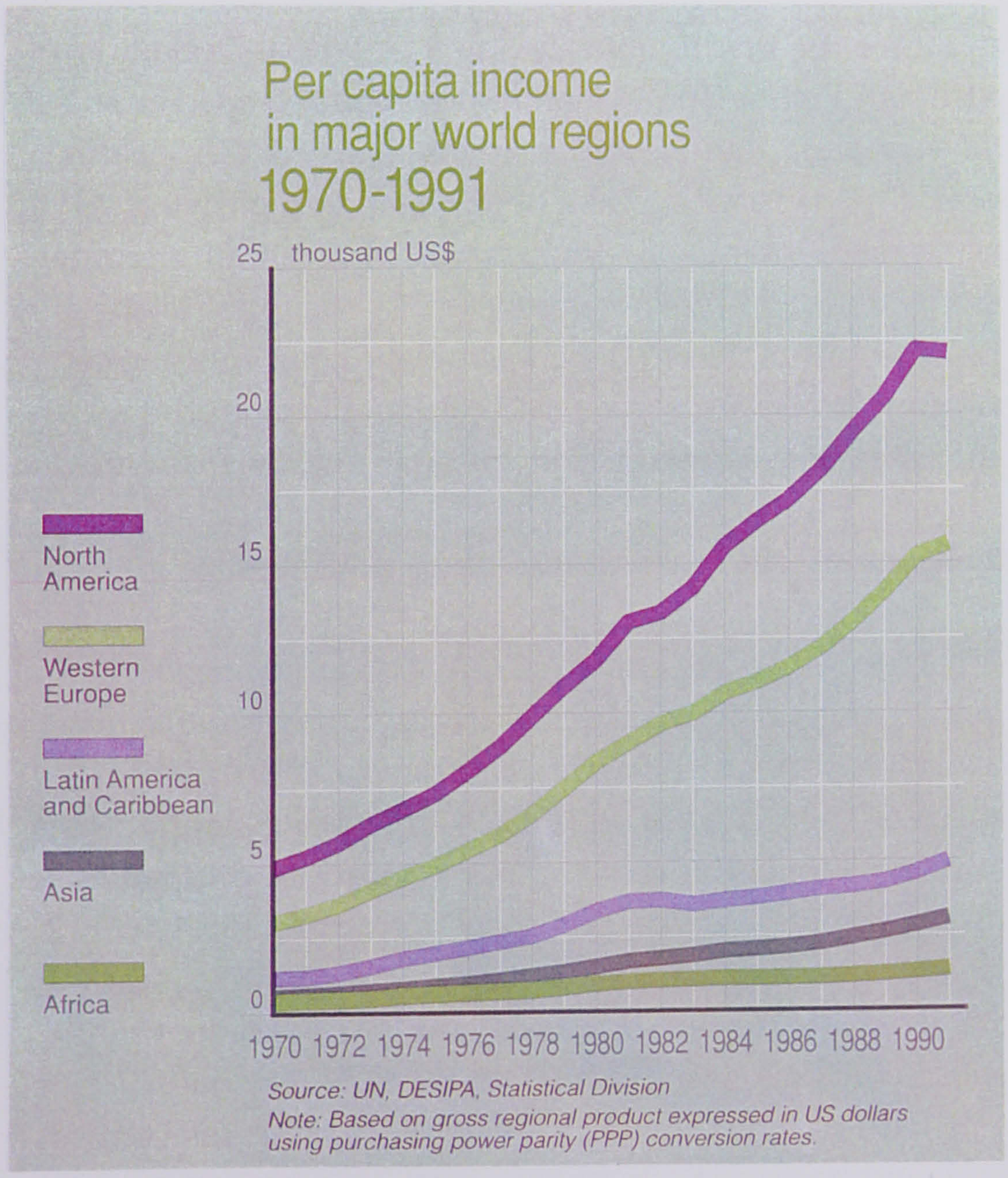


Figure 1: Per Capita Income in Major World Regions 1970 to 1991
Source: UN Critical Trends, 1997

The trends in economic growth are actually increasing the gap in wealth between the developed and the developing countries. This increasing inequity will serve to increase relative poverty of in developing countries. In addition to this the population growth rate in developing countries is high such that in absolute terms, despite the increase in economic growth, the benefits associated with the increase in economic growth will be outpaced by population growth. Current trends therefore serve to widen the gap in relative poverty between the developed and the developing countries despite apparent improvements to the situation.

Poverty

Increasing relative poverty is one aspect of poverty, however absolute poverty remains an issue of concern in developing countries. The numbers of people living in poverty are substantially higher than they were a decade ago despite the growth of the world economy. The total number of people living in absolute poverty (defined by the World Bank as people living on less than US$1 per day) increased to just over 1.3 billion in 1993 (Worldwatch Institute, 2001). Nearly 2.8 billion people live on less than US$2 per day; this is nearly half the world's population. The United Nations Development Programme (UNDP) offers a further measure of poverty entitled "low human development" and the share of the world's population suffering from this has fallen from 20% in 1975 to 10% in 1997[1].

---

[1] For a more comprehensive understanding of human development see UN's Human Development Report 2001 at www.undp.org.

While much of the absolute poverty in the world is centred on the developing countries there are signs that some of these countries have economies which are growing very quickly. For example, economic growth rates from 1990 to 1998 in India were 60% and in China they were 130% (Worldwatch Institute, 2001). This compares to an average rate of 2% per year from 1973 to 1992 in the European Union (Crafts, 1996) and less than 2% per year in the UK from 1973 to 1998 (HM Treasury, 1998).

Consumption

The increases in wealth have the effect of increasing consumption. A good indicator of changes to consumption patterns is energy use. As people travel more, eat more food, buy more goods and live in larger homes each aspect of their behaviour is marked by increased energy use. A number of different predictions for energy consumption exist. The Conventional Development Scenario (CDS) assumes that energy demand and supply will follow historical growth paths, which are mainly driven by demographic, economic and behavioural determinants. On assumptions made in this model, world energy consumption would almost triple by 2050. A "Middle Course" scenario developed by the World Energy Council (WEC) and the International Institute for Applied Systems Analysis (IIASA) assumes modest estimates of economic growth and technological development and greater improvements in energy intensity, which lead to lower future energy demand. On the assumptions made in this model, global energy consumption will more than double by 2050, but a gradual transition to renewable energy is seen as feasible thus reducing the projected levels of emissions resultant from energy consumption. In either scenario it can be seen that a significant growth in overall consumption is expected (UN, 1997).

Certain goods and materials can be the trademark of wealthy lifestyles. The table below (Table 1) compares levels of ownership of some of these in different countries. The numbers for Brazil can be taken as indicative of levels of ownership of many of the developing countries. It is accepted that a key goal for developing countries is to raise the standard of living to be comparable with the western world. Table 1 shows the scale of that desired increase in the standard of living.

	1996 Private Consumption Expenditure $/capita	1996 Motor Vehicles/ 1000 population	1996 Telephone Mainlines/ 1000 population	1996 Mobile Phones/ 1000 population	1996 TV sets/ 1000 populatior	1996 Personal Computer / 1000 populatio	1995 Commercial Energy Use (kg of oil equiv./ capita)
UK	11,891	399	528	122	612	193	3,786
Sweden	14,669	450	682	282	476	215	5,736
Brazil	3,058	79	96	16	289	18	772
USA	18,039	767	640	165	806	362	7,905

Table 1: Per Capita Ownership or Consumption of Key Goods and Materials for Selected Countries
Source: 1999-2000 Update to Accompany International Business: The Challenge of Global Competition, p18, 7th edition (Ball and McCulloch, 2000)

As can be seen from Table 1 above, if Brazil were to increase its commercial energy use to that of the USA there would be a ten-fold increase in the quantities of energy used per capita. This relates to increased production activities but does not take into account increased consumption relating to operating the greater number of goods owned and operated by a population raising its standard of living. Increases in consumption and the potential areas of new markets can be seen clearly in relation to computers where a twenty-fold increase in ownership of personal computers in Brazil would lift ownership levels to the equivalent of the USA.

Even in developed countries growth in markets is still possible when ownership rates in the UK are compared against higher ownership rates of the same products in the USA. For example to raise UK levels of ownership to that of the USA would require a near doubling of ownership of motor vehicles and personal computers. This demonstrates a significant potential for market growth and competitiveness in the developed world as well as the developing world.

Environmental Quality

Increases in economic growth in the developing countries will help to eradicate poverty but globally they will also lead to patterns of increasing consumption. For example meat-based diets and automobile-centred transportation systems are some of the practices resulting in high consumption first adopted by the billion or so people living in rich countries and proliferating in developing countries. As consumption grows, environmental pollution and waste management problems grow.

Late in 2000, the Intergovernmental Panel on Climate Change (IPCC), the scientific body that advises government negotiators, produced its latest report. It included the strongest consensus yet that society's release of carbon dioxide and greenhouse gases contributed substantially to the observed global warming over the last 50 years. Figure 2 below illustrates various scenarios regarding projected levels of carbon emissions. The variations in the scenarios are explained by the projected global primary energy mix over the same period. The CDS and WEC/IIASA models make assumptions as explained earlier (pg. 3). The "Low Carbon Dioxide Emitting Energy Supply System" (LESS) model assumes a significant improvement in energy efficiency, which cause primary energy consumption to rise much more slowly than GDP.

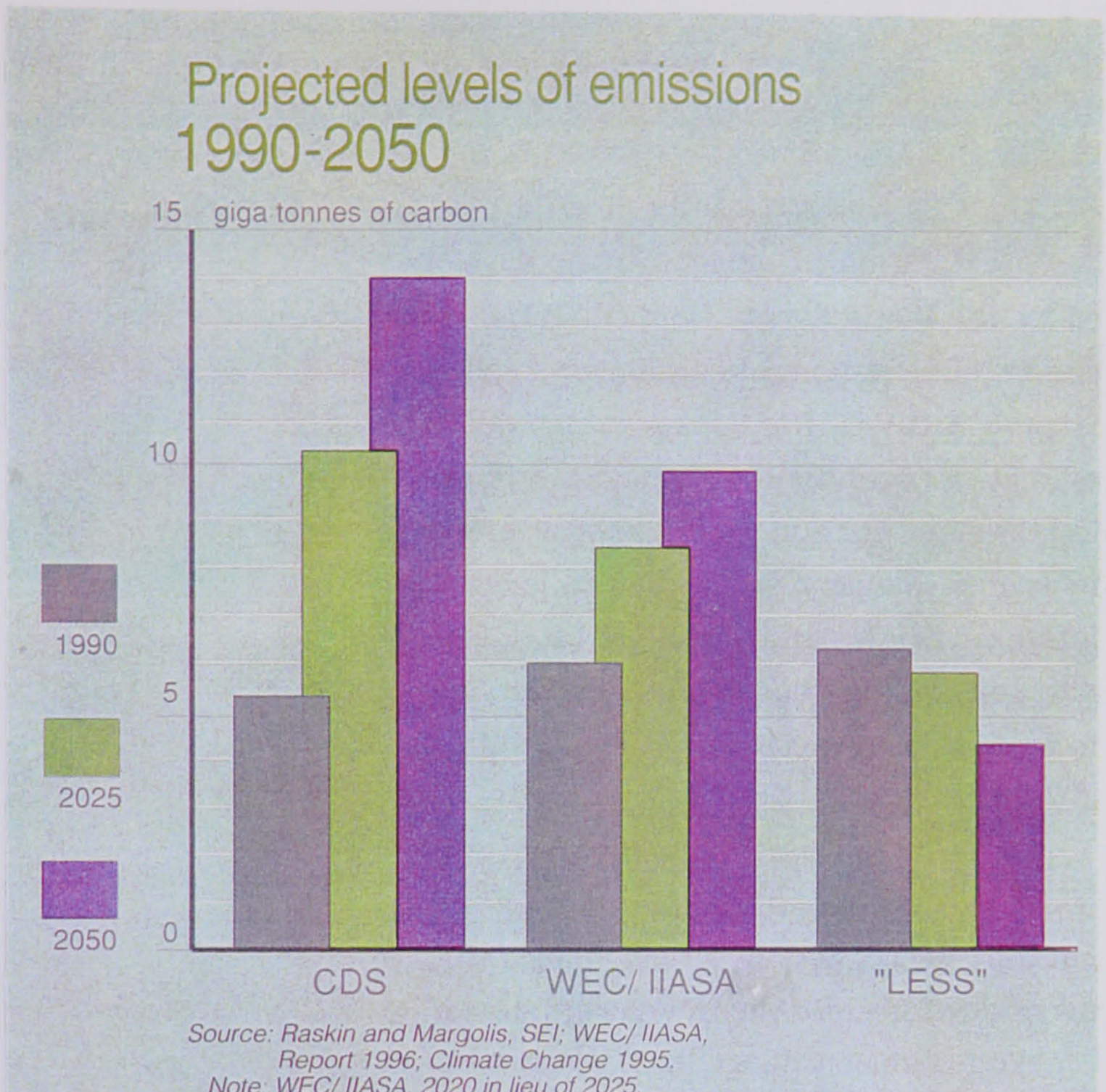


Figure 2: Projected Levels of Emissions 1990 to 2050
Source: UN, Critical Trends, 1997

Figure 3 illustrates the global primary energy mix expected for each scenario. This ranges from slight to significant increases in the quantities of renewable energy in each scenario.

However poverty is also known to cause environmental degradation too. In impoverished areas around the world the rural poor are pushed onto marginal lands, from which they must hunt bushmeat, harvest trees or clear land for pasture or crops in order to survive. This often results in soil erosion making the process unsustainable. A 2000 study on the root causes of biodiversity loss, sponsored by the World Wide

Fund for Nature (WWF) concluded that together with other forces, poverty often plays a major role in environmental degradation (Worldwatch Institute, 2001).

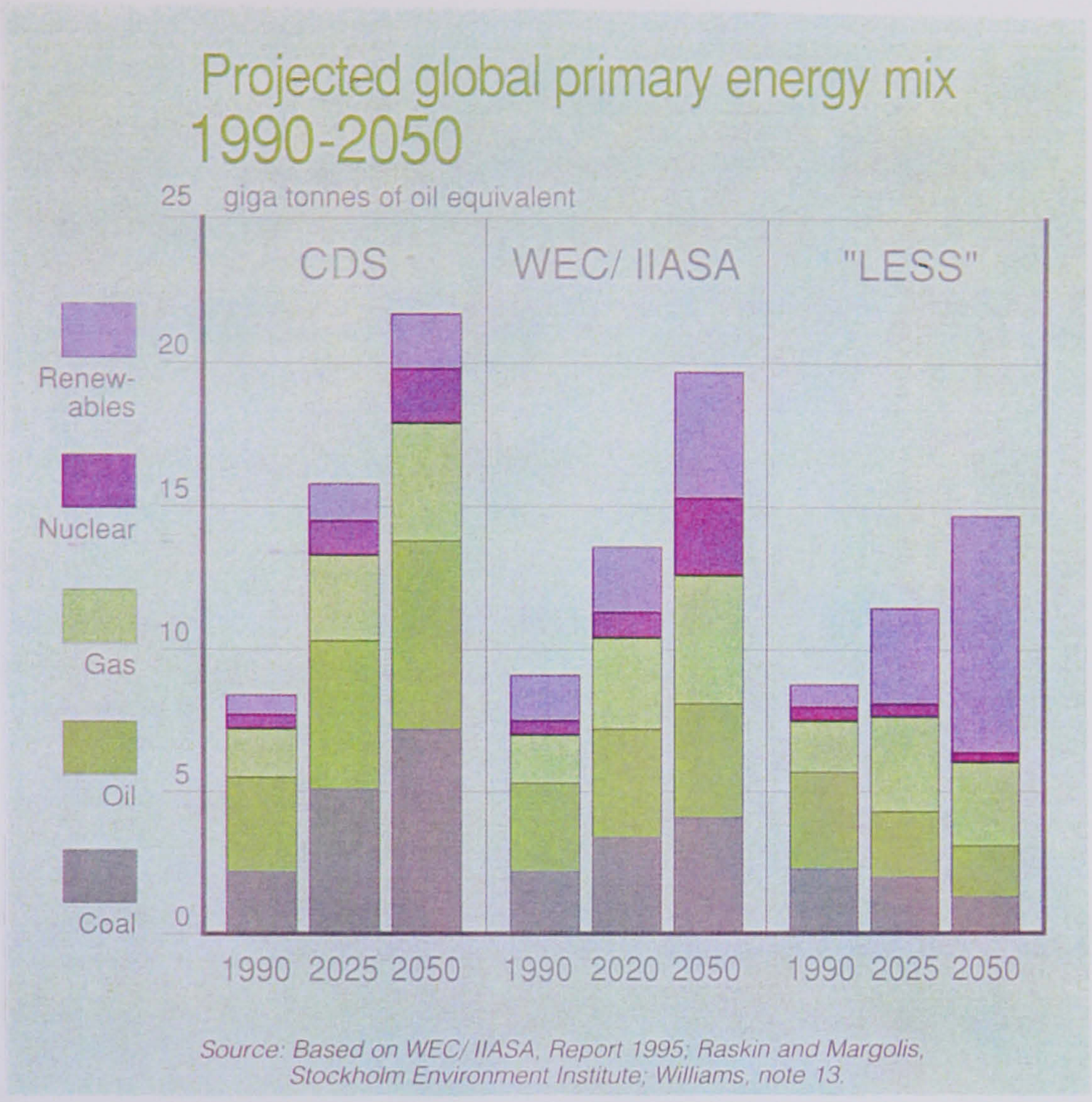


Figure 3: Projected Global Energy Mix 1990 to 2050
Source: UN, Critical Trends, 1997

Improving the State of the World

Reducing levels of absolute poverty, reducing the inequitable distribution of economic growth and reducing the environmental impact of increasing levels of consumption are key elements in improving the state of the world. However, increasingly it is being acknowledged that reduction of poverty is such a complex and challenging problem that economic growth alone cannot solve it. In the World Bank Development Report 2000, the World Bank acknowledges the failure of economic growth to reduce the numbers of people in poverty or to close the equity gap in many nations. The report urged a broader, more comprehensive strategy to fight poverty, noting

"*Facilitating the empowerment of poor people, by making state and social institutions more responsive to them, is also a key to reducing poverty.*" (World Bank, 2000)

The Worldwatch Institute Report 2001 notes that

"*Around the world, a strengthened consensus is emerging that reducing poverty is a complex undertaking that requires extensive but delicate government intervention including investments in education and health, strong legal and financial systems, land reform and strong anti corruption policies.*" (Worldwatch Institute, 2001)

Thus, the report concludes, a reliance on market mechanisms and private intervention in its current form is no longer enough. The report findings suggest that people will not choose options for long-term sustainability without strong guidance and opportunity to make those choices.

Change

Reduction or even eradication of poverty in isolation will not make sustainable improvements to the state of the world. With that progress will come a need to mitigate the environmental effects of increasing levels of consumption and address equity in the distribution of wealth. Neither of these, and consequently sustainable development, can be achieved without change. Particular personalities and demographic profiles are associated with various stages of adoption of change. At the leading edge of change are innovators, who tend to be well educated and socially connected. Change then spreads to early adapters, the early majority, and the late majority each accounting for a particular share of the population. The last to adapt are the laggards, traditionalists who are often socially isolated. If opinion leaders - the innovators and early adapters - can be identified for a particular issue, change efforts can be focussed on this group in the expectation that they will help the innovation or idea to spread (Rogers, 1995).

Extending this principle to the business sector suggests that in order to lead a culture change in business, efforts should be focussed on the early adapters and innovators, i.e. leading businesses with a proactive attitude. The tendency for such a group of businesses to be well educated (knowledgeable) and well connected gives increased importance to the role of education and partnership working in creating the right business environment for these companies in order to motivate them to lead change.

To improve the state of the world the changes that need to take place relate to increasing responsibility for the common good rather than personal gain. Over time societies have developed four strategies to persuade people to change by redefining their self-interest using an increasingly longer time perspective (Gardner and Stern, 1996). The most common approach is for societal authorities to use the force of law, or officially sponsored incentives, such as fiscal instruments, to determine how resources are to be used and by whom. Education is also used to convince people to act in the common interest. However critics see formal education as strongly biased towards status quo societal values and it is argued that since the European Enlightenment during the mid eighteenth century education has rarely challenged the modern world view (Porter R, 1990). Appealing to people's values, especially through religious beliefs, is another tool for persuading people to act in the common good. In many societies religion's role is not as great today as it was in the past, however, and so appeals to values may need to take many forms, only some of which are faith based. Finally, many cultures have used small group management to protect common resources, for example through the community-led management of resources.

Some of the above tools for change are addressed in this thesis and in particular the extent to which the UK and Scottish governments are leading change using these tools through education, officially sponsored incentives and legal or officially sponsored tools. Particular features of possible government activity to affect change are clearly the use of laws, regulations and fiscal incentives, education, creation of values about sustainable development and engagement with stakeholders and particularly communities to help them manage local and global resources more effectively.

The Role of Business in Society

Most nation states organise their economies around private business, giving this sector a potentially powerful role in shifting economies towards sustainable development. Combined with visionary leadership, the profit motive is often channelled to launch businesses towards sustainability. In practice, motivated businesses have used several common business strategies to progress implementation of sustainable development while boosting profits and increasing their competitiveness. Broadly these strategies are:

1. Product Differentiation: Consumers are increasingly interested in more eco-friendly products and in some areas are willing to pay more for them.
2. Waste Reduction: Companies increasingly view pollution and waste as proof of inefficiencies in production processes rather than as inevitable by-products of production.
3. "Zero Waste" Companies: By recalling the by-products of production, companies avoid sending waste to landfills or other expensive disposal options, and often generate new revenues in the process.

4. Lobbying Government: Companies can lobby government to influence the regulatory climate, or work with competitors to set environmental standards for the industry. By persuading governments to constrain competitors' unsustainable behaviour, a firm can position itself to be a green leader, and possibly gain market advantage.
5. Green Practice Industry Wide: A different version of lobbying government occurs when firms band together to "green" practices industry-wide, either to forestall expensive government mandates, improve public image, or both.
6. Rethink Reason for Existing: Companies can do this in a way that lightens their impact on the environment and society. Businesses that shift from supplying goods to providing services are a case in point (Worldwatch Institute, 2001).

Aims of the Thesis

The scale and widespread distribution of the global problems described earlier in this chapter, of poverty and environmental degradation, is testament to the lack of capacity of current methods of governance to resolve these problems. Efforts at improving governance of social and environmental problems have largely been targeted through economic solutions on the basis that by generating enough wealth these problems will be overcome (OECD, 2001). However the examples mentioned earlier in this chapter indicate that the economic based solutions are failing to address these problems sufficiently. There are also signs that economically based solutions are creating further social and environmental problems relating to high levels of consumption of goods and increasing inequity of distribution of wealth between developed and developing countries (Worldwatch Institute, 2001).

Sustainable development requires generation of wealth, the addressing of social concerns and protection of the environment at a global and a national level. The economic approach to global governance is advocated by governments and implemented by business and industry (the private sector). Specifically business and industry are the principle generators of wealth. However governments and their local delivery agents (the public sector) have roles in addressing social welfare, protecting the environment and international relations. Agenda 21, the globally agreed policy for sustainable development, recognises that governments must engage with and encourage activities from a number of sectors, one of which is business and industry.

Finding ways to create superior goods and services is the essence of economic behaviour and thus the essence of wealth creation (Porter, 1990). With current economic models one of the simplest ways to achieve this goal is to increase consumption of goods and services. A potential conflict between the role of wealth creation and the roles of social welfare and environmental protection arises once the necessity of competition to create wealth is recognised. A more equitable distribution of wealth is an aspiration for addressing relative poverty. Equitable distribution of wealth runs contrary to the theory and application of competition and thus economic approaches to governance. This is the essence of the conflict between competitiveness and sustainable development.

By not attaching a value to the environment, its degradation is treated as an externality and thus not a feature in decision-making when considering competition and wealth generation. This in turn means that decisions regarding wealth creation

are often made without considering the impact on the environment, except where regulatory regimes require such consideration.

Despite the apparent conflict between competitiveness and sustainable development there are examples of both the public and the private sector attempting to resolve this conflict through practical actions. The example of the preparation of Agenda 21 by the United Nations and their invitation to the private sector to participate in the preparation of Agenda 21 demonstrates public sector efforts at a global level. Widely reported examples of business and industry attempting to address social and environmental priorities while retaining their focus on competitive and profitable activities also exist[2].

Recognising that there is potential to resolve this apparent conflict of interests between competitiveness and sustainable development and recognising that resolution of this conflict could mean significant improvements to the global situations outlined above creates sufficient demand to examine this area further.

The aim of this thesis is to investigate the potential to reconcile sustainable development and competitiveness in the public and private sectors and to present recommendations that will facilitate any such reconciliation thus making practice more sustainable, more consistent and more widespread across both sectors. In particular the thesis will explore a new concept of sustainable competitiveness and whether or not it has the potential to encapsulate the reconciliation of sustainable

development and competitiveness. While the problems that sustainable development seeks to address are global, they also exist at a national scale. Each nation state operates within specific national conditions and historical developments and this means that different cultures exist in each nation state. Therefore this thesis will focus only on one nation state comparing efforts in each sector within that nation. Scotland has been selected as the basis of the study.

In order to realise the aim of the thesis a number of objectives must be achieved. Firstly, a clear conceptual understanding of both sustainable development and competitiveness needs to be reached in order to determine the potential for reconciliation through sustainable competitiveness and reach a conclusion about what sustainable competitiveness may actually entail. Secondly, it is important to understand the approach that each sector, public and private, is taking towards sustainable development and, in particular, whether that approach is an holistic one given the different relevant disciplines of economics, social welfare and environmental management. The third objective is to understand the relative roles and activities that each sector is undertaking in order to achieve its goals in relation to sustainable development and whether or not those activities:

(a) specifically aim to delivering sustainable development;

(b) reconcile sustainable development and competitiveness; and/or

(c) simply re-brand existing competitive activity.

The fourth objective is to understand whether or not the activities of each sector are synergistic, complementary, consistent or working against each other to achieve

---

[2] See for example the range of activities described later in Chapter Four from a number of companies.

reconciliation of sustainable development and competitiveness and whether or not these activities fit within the framework of sustainable development.

Methodology

The following methodology describes the way in which data has been gathered to draw the conclusions of the thesis as well as the limitations and scope of this data. The scope of the data is described in detail below, followed by a description of the literature review, the data gathering and the methods of analysis.

Scope

Firstly in terms of scope the thesis is based on data collected in Scotland over the period from 1999 to 2001. Scotland is a small country with an economic situation similar to that of many other developed countries. As part of the UK, and thus the European Union, a policy framework common to many developed countries governs the country. In addition, as part of the UK, the economic growth and competitiveness of Scotland are both comparable with many developed countries. As noted in Table One, the potential for growth and increased competitive behaviour remains high in the UK and also in Scotland. This means that like many other developed countries the way in which competitive advantage is attained in Scotland is still open to change. The country is small enough to facilitate data gathering across the whole country appropriate to the thesis.

The thesis aims to investigate the potential to reconcile sustainable development and competitiveness. Reconciling such activities challenges conventional thinking. Innovators that challenge convention by taking innovative approaches to sustainable

development and competitiveness are therefore likely to offer the most insight into what is possible. As such the methodology is focussed on seeking to understand good practice. This will give an indication of what it is possible to achieve and the conditions that have enabled good practice to occur. The focus of data gathering on good practice examples means that the conclusions drawn relate to what is possible, not to what is widespread practice. However the methodology applied to researching the good practice is intended to improve understanding of how this good practice can be encouraged more widely. This makes the recommendations applicable to early adapters and possibly also to setting conditions that encourage uptake of good practice from late adapters.

The encouragement of good practice in reconciling sustainable development and industrial competitiveness could result from either government led initiatives in the public sector or from private sector initiatives from business and industry itself. The thesis explores the approaches taken by both sectors based on examination of good practice in each sector.

Literature Review

The objectives of the literature review are to:

- understand the concepts of sustainable development and competitiveness;
- understand the full range of examples of good practice and what is being implemented throughout the world;
- understand how the public and private sectors in Scotland approach sustainable development and how holistic those approaches are;
- explain the policy framework within which each sector is deciding its approach;

- inform the interview questions for exploring good practice in Scotland; and
- add some objective supporting data to that gathered during interviews.

To aid clarification on the sectoral approaches for the public and private sectors, the thesis reviews literature on Agenda 21, the globally agreed sustainable development policy, and its objectives, priorities and recommended tools for implementation as well the private sector role in its development.

The opportunities and the pressures created by competitiveness in relation to sustainable development are reviewed providing a context for later analysis on the reconciliation of sustainable development and competitiveness. Some global examples of the public and private sectors implementing sustainable development offer practical insight into the features of innovative practice that are investigated in more depth in the data gathering chapters. These examples are identified through the International Institute for Sustainable Development[3].

The examples of good practice are used, together with earlier conclusions about reconciling sustainable development and competitiveness, to build a matrix that shows the different types of good practice that exist and the drivers and supports that motivate that activity.

---

[3] For more information on the International Institute for Sustainable Development (IISD) see http://www.iisd.org

Data Gathering

The first two objectives of the thesis are met by the literature review. The third objective of the thesis, to understand the relative roles and activities that each sector takes in Scotland, is met through data gathering based on actual practice. The data gathering is based on innovative practice to reflect the early stages of change that sustainable development implementation is in, as explained earlier in this methodology. Data gathering has been undertaken by conducting a series of interviews with relevant staff in organisations delivering innovative practice in both the public and private sectors and complemented where necessary by further literature review specific to the case studies. Further detail on the methodology for the selection of the case studies is given in the following sections.

Data Gathering in the Public Sector

The public sector has a role in translating global policies into nationally and locally applicable policies and implementing them. Since the United Kingdom (UK) is a member of the European Union (EU) the details of translating European objectives are the responsibility of the UK Government, the Scottish Parliament and associated civil services with respect to European objectives. The same governance organisations in the UK and Scotland are responsible for development and implementation of policies on competitiveness. An overview of the public policy framework and the main policy delivery agencies is derived from further literature review work as well as interviews with three national delivery agencies in Scotland. These delivery agencies are:

- the Scottish Executive, responsible for Scottish policy (devolved UK policy) and management of all policy (Scottish and UK) implementation in Scotland;

- Scottish Enterprise, the key agency responsible for setting and delivering economic development policy in the central belt and the south of Scotland, grant-aided by the Scottish Executive; and
- Forward Scotland, the charitable organisation grant-aided by the Scottish Executive with the remit to seek innovative solutions to sustainable development.

However it should be noted that no sole delivery agency for sustainable development exists in Scotland, more that responsibilities are devolved to existing agencies.

The overview of the public policy framework sets the context for implementation of policy and is a core part of the data gathering, recognising the difference between setting policy and implementing it.

Scottish Enterprise is one of two agencies setting and delivering national economic development strategy in Scotland. Scottish Enterprise covers the geographic area of Scotland's central belt and the south of Scotland. The second agency, Highlands and Islands Enterprise, has a similar but not identical remit for the Highlands and Islands area of Scotland. The reason for the slightly different remits between the two agencies is the highly rural nature of the Highlands and Islands area that creates a different regional economy. The Scottish Enterprise area has been selected for examination in this thesis both to retain a clear policy focus by only selecting one of the two agencies and to research the area which has the majority population in Scotland and is the focus for industrial operation in Scotland[4].

---

[4] For more information on the Enterprise Agencies see for example http://www.scottish-enterprise.com and http://www.hie.co.uk

A number of research themes were identified during the literature review and these themes were explored through a series of interviews with public sector agencies involved in taking a national perspective on delivering policy as well as those delivering more localised examples of innovative practice. As noted above the national agencies were selected as the main lead organisations involved in implementing sustainable development and competitiveness. The more localised examples of innovative practice were identified through discussions with the lead agencies interviewed and these were examples of specific projects with each of the agencies noting that no one public sector organisation had applied the reconciliation of sustainable development and competitiveness to its main activities. This finding confirmed that the research focus on innovative examples of work was appropriate. Specifically Forward Scotland identified good practice examples in the areas of Scottish Borders, South Ayrshire, Lanarkshire and Renfrewshire. Scottish Enterprise confirmed this selection by recommending interviews with representatives on specific projects in Scottish Borders and Lanarkshire. The Scottish Executive made the same recommendations. All of these examples were inside the geographic boundaries of Scottish Enterprise.

The examples of innovative practice were all specific projects. Therefore each agency involved in the projects' development and delivery had assigned specific staff to each project. It is these staff that were selected as the subject for interview on the basis that they were the people most familiar with the project, its ethos, establishment and the way it was regarded more widely by the lead organisation implementing it.

The lead organisations were a combination of local authorities (with limited responsibility for economic development and sustainable development). local enterprise companies (the local delivery agents for Scottish Enterprise) and in one case a consultancy company in collaboration with and funded by the local authority and the local enterprise company. Interviews were carried out with more than one representative of the project where possible. On some occasions this involved interviewing more than one person at once for a specific project and on other occasions separate interviews were carried out with the officers. The variety of roles of the officers involved in the projects and therefore the interviews reflect the innovative nature of the projects in that there is no Scotland-wide acceptance of any particular agency or department having the lead role in such projects. The full range of projects, organisations, organisation status, interviewees, interviewee roles and dates of interviews is listed in Appendix One.

The interviews undertaken in the public sector data gathering need to be considered in the context of innovative and limited practice. The relevant national delivery agencies have been interviewed and, of these, Scottish Enterprise has a geographically limited role that restricts the coverage of the thesis to the central belt and southern area of Scotland. In addition to this local delivery agencies in this area total 27 of 32 local authorities and 12 of 22 local enterprise companies. As such the projects described in the data chapter are the best examples of a number of activities undertaken by the agencies interviewed and these are a small proportion of the total number of delivery agencies working in these fields. All of the projects mentioned are delivered by local delivery agencies although all of them have been supported

financially at a national level and sometimes at a European level. This further confirms that the projects are innovative and not part of conventional organisational activity.

Data Gathering in the Private Sector

Given that the companies operating in Scotland do so under the same policy framework described for the public sector, the data gathering for private sector activity focuses only on company activity. There are two key sources of information about companies that demonstrate innovative practice in sustainable development. The first is through various award schemes where companies are awarded recognition on the basis of good practice often as a result of entering a competition in particular categories. The second source of information is from the public sector where companies have worked with voluntary, not for profit companies or public sector agencies to deliver some aspect of their corporate business in a more sustainable way. Appendix Two outlines the sources of information used to select companies either from awards received or from public sector reporting. It also lists the names of companies in Scotland identified by results from these sources.

In order to maximise benefit and understanding of good practice from a limited number of interviews, the companies identified for interview were those that demonstrated good practice in more than one area of activity relating to sustainable development. For example, some of the awards listed in Appendix Two related to environmental management where others related to social practice. A combination of types of practice was sought. Interviews were sought from companies that reflected a range of different activities. However certain companies were difficult to

make contact with and some refused interviews on the basis that they were asked for such information too often.

The final list of interviewees reflect the following sectors:

- energy and petrochemicals
- utilities
- food and drink
- transport
- telecommunications
- local manufacturing

Companies approached in the retail and financial sectors were unwilling to give interviews.

The companies selected for interview were predominantly large companies. However a range of all sizes of companies were sought. Full details of the interviewees and their respective roles are given in Appendix Three. Of the large companies some were multi-national, some global and others, such as Railtrack, large national companies. The list of interviewees includes a small company (Belhaven Brewery) and a medium sized company (Smith Anderson). The reason for including smaller companies in the list of interviewees was to understand if smaller companies were working under different pressures than larger companies and to find out if their approach to sustainable development was any different as a result. The smaller companies that were chosen were also actively involved in public sector initiatives and again it was of interest to explore whether or not this made a

difference to their approach to sustainable development. Interviewees were staff recommended by each company that was approached to discuss sustainable development. It should also be noted that data from the interviews is complemented by data collated from corporate publications where appropriate. The private sector, where it implements good practice in relation to sustainable development, has published much more extensive literature on its approach to sustainable development than the public sector and the difference in volume of information presented in the respective chapters on public and private sector approaches reflects this.

As can be seen above there are some sectors that are not included in the sources of good practice on sustainable development and some sectors that were unwilling or unable to commit time to the interviews proposed. Without researching this aspect of corporate activity more fully it is difficult to conclude why certain sectors were less accessible for interviews on this subject. In some cases such as the retail sector, it is clear that companies listed above are fairly proactive in their sustainable development based activities. However such activities are also unusual so that the requests for information in this sector are frequently directed towards retailing companies such as the Body Shop and Ikea making it impractical for them to co-operate at thesis research level. In other cases companies may be concerned that activities promoting a sustainable corporate approach do not stand up to the scrutiny of the interview questions proposed in this research or key officers are less involved in this aspect of corporate activity than suggested by the marketing materials. In the food manufacturing and retailing sectors it was more difficult than in other

companies to locate a specific member of staff with the responsibility for environment or sustainable development making interviews more difficult to arrange.

Analysis

Analysis of the data gathered both from the interviews and the literature review work is used to meet the fourth objective of the thesis. The fourth objective is to understand whether or not the activities of each sector are synergistic, complementary, consistent or contradictory to achieving reconciliation of sustainable development and competitiveness across the two sectors and whether or not these activities fit within the framework of sustainable competitiveness.

The interview questions for each sector were very similar allowing comparison of the approaches in each sector. The questions related to understanding the role of the interviewee, the organisations' interpretations of sustainable development and competitiveness and the activities undertaken to implement sustainable development. In addition motivations for activity and attitudes to government policy were explored. From the questions common research themes emerged and these themes are used as the bases of analysis of data in each sector in Chapters Five and Six. The research themes are:

- perspectives and responsiveness to government priorities and actions;
- understanding of sustainable development in practice;
- ability of the sector to deliver sustainable development;
- form and effectiveness of actions, both environmental and socio economic; and
- integration of sustainable development and competitiveness.

A theoretical matrix of types of good practice in reconciling sustainable development and competitiveness and the drivers and supports for that practice is developed as part of the literature review. This matrix is then used as a framework for the analysis of practice in Scotland comparing the actual practice understood from the interviews against that practised around the world. The matrix facilitates the comparison of activities in each sector and enables conclusions to be drawn about the comparative approaches of each sector and their relative success.

Thesis Outline

Chapter One examines the concept of sustainable development. The evolution of sustainable development is explored through the pressures that led to its international acceptance as a global objective. There are several perspectives on sustainable development but in order to understand them the chapter is split into three sections that discuss the economic, social and environmental perspectives of sustainable development. The chapter concludes by noting that dividing sustainable development into themes in this way may help to understand the concept but that these themes need to be reconciled and addressed holistically before progress can be made in implementing sustainable development.

Chapter Two outlines the concept of competitiveness, its relationship to sustainable development and describes the private sector role in Agenda 21, in particular its development and the approach that business and industry takes towards implementing sustainable development. It also describes the theories of industrial ecology and ecological modernisation both of which have developed from an interest in seeking sustainable business solutions within the existing economic structure of the business

sector. The main features of competitiveness are described and the relationship between these features and sustainable development is analysed in the context of the research presented in Chapter One. An assessment of the priorities that business and industry agreed for its role in sustainable development is undertaken. One specific aspect of business operation that dominated the approach taken by business and industry to Agenda 21 was the effect of sustainable development and Agenda 21 on industrial competitiveness. The chapter reaches conclusions about the specific features of competitiveness that will affect and be affected by sustainable development describing a concept derived during research on this thesis: sustainable competitiveness.

Chapter Three reviews the preparations for UNCED (the Earth Summit) in 1992 and analyses the role of Agenda 21 in delivering sustainable development and its status as a globally agreed policy document for that purpose. Drawing from the input made to Agenda 21 by major contributors such as the World Commission on Environment and Development (WCED) and The South Commission, the chapter assesses the priorities that Agenda 21 sets for the implementation of sustainable development with a focus on the issues that affect business and industry. The priorities set are compared against the concept of sustainable development presented in Chapter One and the concepts of competitiveness and sustainable competitiveness described in Chapter Two. Differences between the concept and the policy document are described. As well as prioritising issues, Agenda 21 sets out specific roles for the public sector. This role is described with particular emphasis on the tools that Agenda 21 recommends for implementation of sustainable development, specifically

market mechanisms, regulations and voluntary agreements. The feasibility of success of Agenda 21 is also covered by this chapter, reviewing the issues regarding political, financial and technological feasibility of implementing Agenda 21 and the implications of this for the role of business and industry.

Chapter Four puts the potential reconciliation of sustainable development and competitiveness into a practical context describing some of the most innovative practical examples of sustainable development globally for both public and private sectors. The chapter relates these examples to the conceptual findings of Chapters One and Two and the policy perspective of Agenda 21 described in Chapter Three. The chapter concludes with a summary description of types of business practice in sustainable development and with themes that will be explored through the data gathering chapters. The conclusions are presented in the form of a matrix that relates types of competitive and good practice in sustainable development to the drivers and supports that facilitate such practice.

Chapter Five describes the key public sector agencies that are responsible for developing policy and implementing it in regard to sustainable development in the business context in Scotland. Within the context of national public policy the chapter offers detailed information on policy regarding sustainable development and competitiveness and describes regulations, fiscal incentives and voluntary agreements currently in place or due to be implemented shortly in the area of sustainable development and their relationship to business and industry. The findings from the public sector interviews in Scotland are summarised here. Boxed examples describe

the projects that are the basis of the innovative practice, which were used to determine the selection of interviewees. The research findings are described through a series of themes. The themes are as follows:

- Government priorities and actions
- Understanding of sustainable development in practice
- Ability to deliver sustainable action
- Form and effectiveness of actions (environmental)
- Form and effectiveness of actions (socio-economic)
- Integration of sustainable development and competitiveness

Chapter Six offers insight into the implementation of sustainable development in the private sector drawing conclusions from interviews with a selection of companies either based in Scotland or with a significant role in Scotland. These businesses have been selected for their innovative practice in sustainable development terms. Insights from interviews illustrate the motivations of businesses becoming more sustainable and the factors and conditions which have made it possible for these companies to realise that vision. These insights are presented in relation to the following themes:

- Perspectives and responsiveness to government priorities
- Understanding of sustainable development in practice
- Ability to deliver sustainable action
- Form and effectiveness of actions (environmental)
- Form and effectiveness of actions (socio-economic)
- Integration of sustainable development and competitiveness

In addition particular aspects of practice in the organisations interviewed are highlighted through a series of boxed examples presented as separate from the main text.

Chapter Seven compares the findings from the data gathering undertaken and presented in Chapters Five and Six and sets this in the context of the earlier literature review work. The activities of the public and the private sector are assessed to determine whether or not each sector is taking a holistic approach and the extent to which reconciliation of sustainable development and competitiveness is being undertaken and is possible. The chapter revisits the matrix developed in Chapter Four and uses it to analyse the activities of the public and private sector for their compatibility and synergy in achieving the goals of Agenda 21 and sustainable development and identifies areas where such compatibility or synergy is not possible.

In Chapter Eight the conclusions of the thesis are presented. The conclusions model the policy process as three stages of concept, policy development and policy implementation to aid understanding of the efforts made to reconcile sustainable development and competitiveness and whether or not sustainable competitiveness is a viable, practical concept. The conclusions discuss whether or not it is possible for the concepts of sustainable development and competitiveness to be reconciled, and whether or not the policy framework in Scotland allows for or encourages reconciliation. A conclusion is reached on whether or not the implementation of policy in Scotland enables or encourages reconciliation of sustainable development and competitiveness and how this effort relates to sustainable competitiveness.

Aspects of sustainable development that are not dealt with at any of the stages of policy described above are noted. Conclusions regarding the complementarity of efforts in each sector, the longevity of application and the potential for widespread application of good practice are presented. Finally, recommendations are made that encourage good practice to be more widely applied.

CHAPTER ONE: SUSTAINABLE DEVELOPMENT

1.1 Introduction

There are various definitions of sustainable development. The difficulty in clarifying what is meant by sustainable development is the all-encompassing nature of the concept. The term "sustainable development" is relatively new, only coming into widespread use during the late 1980's following the publication of the Brundtland report (WCED, 1987). As a result of its relative newness, the term has been the subject of a great deal of debate, trying to clarify the definition in practical terms. This debate for the most part has been in academic and professional circles. It has only recently reached the public domain and still remains so much the tool of the policy maker that it is impractical in terms of public concerns. There is therefore little work available as to the practical meaning of sustainable development for the individual. For this reason this chapter focuses in the most part on the definition of sustainable development in the professional sense, i.e. the definitions used by those working to deliver sustainable development.

There are many ways of defining sustainable development so this chapter will start from first principles, using dictionary definitions. The Concise Oxford Dictionary states the following definitions of "sustainable" and "development":

"Sustainable": capable of being maintained or prolonged; something that can provide support by supplying necessities.
"Development": the act of growing or developing; to bring to a more advanced or expanded stage.

Using the dictionary definitions therefore sustainable development is growth which can be maintained and self-supporting. It would be standard to assume that the reference to growth is to economic growth. Looking at it from this perspective, sustainable development could entail projects which can be self-supporting in the long-term and which contribute to economic growth. It is possible that many projects organised by governments or development agencies could be termed sustainable development if they were to become self-sufficient. But in any efforts at self-sufficiency there are always external influences when current western standards of living are maintained. This is where looking at a simple localised strict dictionary definition of sustainable development hides the truth behind the concept so broadly defined by Brundtland (WCED, 1987).

It is not sufficient to examine sustainable development in terms of single projects or limited areas because by definition the system that is being examined must be self-sufficient. The way in which resource use and pollution cross geographic boundaries so readily contributes to the need to consider sustainable development as something which affects and is affected by the whole planet. The first section of this chapter (Section 1.2) describes how it came to be globally recognised that consideration of environmental issues would need to become an integral part of decision-making if resources were to continue to be available to support the growing population of the planet.

The most commonly quoted definition of sustainable development is that first published in the Brundtland report (WCED, 1987) and this is as follows:

> *"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:*
> - *the concept of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given; and*
> - *The idea of limitations imposed by the state of technology and social organisation on the environment's ability to meet present and future needs."* (WCED, 1987, p43)

This chapter seeks to explore the definition of sustainable development in the context of each of the three separate spheres of traditional divided world order: the natural environment, the social context and the economic sphere. Ideally sustainable development is the synergy of three building blocks. It encompasses economics, public policy and environmental management. Historically the three building blocks have been considered quite separately. It is only through the later part of this century that economics started to consider its impact on public policy and welfare economics started to consider how to take into account social problems such as poverty, unemployment and health care. Prior to the development of welfare economics it was largely left to campaigners to highlight the traditional social problems (McHarg, 1977). Environmental concern grew up entirely separately as an ethical consideration for other species. Similar to the development of awareness of social problems, environmental awareness was the result of targeted campaigns by certain pressure groups (Silvertown and Jarre, 1990). The diverse nature of the problems led to separate professions being involved in separate issues. It is only since the 1972 United Nations Conference on the

Human Environment that the integrated nature of the problems and therefore the need to integrate solutions has been identified (Quarrie, 1992).

Professions are traditionally separate and have different perceptions, values, tools and methods of problem solving. Each of the three professional spheres of economics, public policy and environmental concern has a different view on the definition of sustainable development and the meaning it has for their particular profession. This chapter therefore separately considers the definition and interpretation of sustainable development for each of these professional capacities in Sections 1.3, 1.4 and 1.5. There are shortfalls in each of the separate considerations. This is largely because there are traditionally shortfalls in the analytical work of each sector as regards their use as absolute policy tools. These are identified and related to the separate interpretations of sustainable development.

In addition values are discussed in each section as the pivotal mechanism on which each interpretation lies. The way things are valued, whether this is in a monetary sense or in an ethical sense, is a central theme running through most debates regarding sustainable development. This develops into the consideration of equity and this is a theme that runs common to each section. There are in addition subject specific issues that arise only in their relevant section. For example in the environmental field, resources and pollution are a dominant issue. Socially, it the distribution of wealth and resources which

dominates debate. Finally in economics a central debate questions the merit of economic growth as opposed to economic development.

The chapter concludes in Section 1.6 by discussing the common themes and problems of each of the professional views. It observes the overlap between debates and attempts to synthesise a common interpretation of sustainable development.

1.2 History of Sustainable Development

As has already been noted sustainable development embodies three traditionally different and separate spheres of global order. The concept of sustainable development came about through developments in both heightened concerns for the natural environment and the realisation amongst economic academics that economic growth was not solving common problems that have their roots in poverty.

1.2.1 The History of Environmental Concern

Environmental change has occurred throughout the history of the world. Before man existed as a species landforms were changed by ice ages, changing river flows, earthquakes, volcanoes and even the patterns of species development. Biodiversity changed as species evolved and some species became extinct leading to further changes in dominant species and food chains. It was the incredible rate of technological advance during the industrial revolution from AD1800 onwards which provoked the greatest impact on the natural environment however (Mannion, 1991). Technological advance is not the only factor involved in development of the situation in which the world now

finds itself. Population growth was very fast in the period from AD1800 to the present day and population growth continues to increase. In AD1800 the world population was approximately 957 million people, 2% of whom lived in cities. In 1985 this had grown to 4853 million people, nearly 50% of whom live in urban areas (Simmons, 1993). The changes in human lifestyle which have resulted from the changes towards an urban lifestyle and the changes in farming practice and resource use from technological advance are very potent factors in the environmental problems which the world faces today. However this does not explain why the stress on the natural environment has played an increasingly dominant role in, at least western, lifestyles since the 1970s.

Some people have always expressed views about the environment and differing attitudes have been expressed and recorded historically in literature. It was however Rachel Carson's "Silent Spring" of 1965 which first highlighted the dangers of modern pesticides and related these to environmental degradation. This book was widely read and is still quoted as a demonstration of growing environmental awareness from the 1960s onwards. The "Limits to Growth" book (Meadows et al, 1972) was also widely distributed and reached an audience of millions. This book was based on a scientific model measuring changing resource consumption against resource availability and increasing population. It concluded that there were physical limitations to continuing the pattern of increasing population and economic growth. The book further concluded that these limits were not far in the future. "Limits to Growth" is again still widely quoted by

environmental pressure groups trying to inspire people to protect the environment and minimise damage to it.

In the 1970s the awareness of environmental issues was aided and popularised by other problems of a more social nature. The following list is not extensive but demonstrates the number of factors at work in popularising environmental concern and extending it beyond the traditional groups sometimes referred to as "deep greens" that previously dominated environmental activism:

1. The energy crisis which occurred twice in the 1970s and which was solved by economic measures; i.e. an increase in the price of oil (Silvertown and Jarre, 1990)

2. A growing awareness of the dangers to health of nuclear power highlighted by campaign groups such as the Campaign for Nuclear Disarmament (CND), Friends of the Earth and Greenpeace (Silvertown, 1990)

3. The awareness of transboundary environmental problems such as acid rain in Scandinavia and water pollution carried down cross-border rivers such as the Danube (Quarrie, 1992)

4. The United Nations Conference on the Human Environment where the problems of development versus the environment in Third World countries were highlighted (Quarrie, 1992)

5. Increasing concern over the growing world population and worries that the "Green Revolution" of increased efficiency of food production through the discovery of pesticides was either not sufficiently powerful or too dangerous to human health to

produce the quantities of food required for the world's growing population (Tietenberg, 1992).

1.2.2 Economic Growth

In parallel with the above development in concern for the natural environment which was in part prompted by social change, were changes in the understandings and belief in the ability of economic growth to solve such problems as unemployment and a weak economy.

The "Limits to Growth" text (Meadows et al., 1972) referred to above was one instrumental factor in the realisation that economics was based on a model which itself had limits. The book referred to was written by economists but only four years after its first publication the sponsors of the book revoked the conclusions of the text because the model used to draw the conclusions of the book was itself limited. Data similar to that used in the original book was used to test the model. The only differences in the test data used were slight variations on estimates of resource availability, population growth and other fundamental estimates but these were realistic and the marked difference in the outcome of the model predictions were so significant that they led to different conclusions (North, 1995).

The book, in its original form, therefore gave the environmental activists' a key to political persuasion but in its very limited press release four years later stimulated a mass

of academic activity. Partly as a result of this but also of other factors a branch of economics known as welfare economics developed. This was an attempt by the economists not to get swamped in the wave of anti-growth activism sweeping the western world but it was also a valid attempt to tackle social and environmental problems with new economic models (Markandya and Richardson, 1992). The worth of welfare economics in sustainable development is discussed later in this chapter but at this point it is worth noting that through the 1970s economics was also developing to take account of the changing views discussed above.

With the development of this new branch of economics came the goal of sustained development which was an economic term expressing the desire for development but in a manner that did not destroy itself. The term was used as early as 1973 in a United Nations report which was a preliminary to the UN Conference on Population held in 1974 (UN PRED, 1984). It was most likely a combination of all these factors that led to the Brundtland report agreeing the phrase it did in 1987. Using a term that has economic roots made political leaders believe there was some substance to the conclusions of the Brundtland report. A recommendation and outcome of the report was the United Nations Conference on Environment and Development (UNCED) that was held in Rio de Janeiro in 1992[5].

---

[5] The development and outcomes of UNCED are described more fully in Chapter Three.

1.3 The Environmental View: Resource Capacity

The history of environmental concern and parallel development of welfare economics were gathering momentum in the 1970s and 1980s and were pivotal in putting pressure on the UN to hold a global conference on Environment and Development in 1992. It was only at the 1972 Stockholm Conference on the Human Environment that the full extent and nature of environmental problems throughout the world was first officially noted. The 1972 conference was an opportunity for governments to approach other neighbouring governments and discuss the new type of environmental problems: the transboundary problem. The definitive example is acid rain whereby sulphur dioxide emissions in the United Kingdom, for example resulting from electricity generation, affected forests and lakes in Scandinavia by falling there as acid rain. More recently emphasis has shifted from neighbouring transboundary problems to those with global impacts, such as ozone layer depletion. The Brundtland Commission was set up in 1983 to monitor progress of the 1972 Stockholm Conference and to identify the progress in tackling these transboundary problems, reporting its findings in 1987 and simultaneously proposing the 1992 UNCED (WCED, 1987).

When examining the environmental view of sustainable development, a number of features of environmental problems need to be taken into account. Firstly environmental problems are invariably a result of different stresses that build up over time. The impact of environmental stresses varies according to the capacity of the local and the global environment to absorb and adapt to these environmental stresses. How people perceive

the limitations of capacity depends on their values. Traditionally problem displacement has resolved local problems while actually only moving them away and creating problems in another locality. This problem displacement stresses the importance of looking at solutions more holistically. Each of these five aspects of environmental issues is discussed more fully in the following sections.

1.3.1 Environmental Stresses

Section 1.2.1 noted that there has always been environmental change and species have developed and evolved or become extinct as changes have taken place. The first scientist to note this was Charles Darwin in his 1859 publication "The Origin of the Species". From this early work many other scientists followed suit and the idea of dynamism in environmental change was introduced. Agents of environmental change were historically and still are natural elements such as ice, wind, water, plants and animals. The evolution of humans has created one of the most powerful agents of environmental change which we know about today.

It is accepted that environmental change occurs and that globally species adapt to suit their environment. Environmental stress occurs where species struggle to adapt sufficiently or at a rate suitable to continue living in that environment. Tansley first introduced the concept of the ecosystem in 1935. He stated

"The more fundamental conception is... the whole system including not only the organism complex, but also the whole complex of physical factors forming what we call the environment... we cannot separate [the organisms] from their special environment which provides the basic units of nature on the face of the earth...

these ecosystems as we may call them are of the most various kinds and sizes" (Tansley, 1935).

It is the interdependence of living things and their interconnected reliance on each other that has lent weight to the argument that biodiversity must be protected if the human species is to survive. The environment provides the basic needs for humans by offering food, shelter and warmth. In addition it contributes to their well being by providing scope for relaxation and leisure.

Stress on the environment can build up and lead to recognised environmental problems. Environmental problems are very diverse and vary considerably from country to country. Globally there are two types of environmental problems. There are those that have their roots in the wealth of the developed countries and those that have their roots in the poverty and social inequity of under developed countries. From the wealthier countries the problems are of pollution from heavy industry and disposal of the high quantities of waste typical of a consumer society. From the less wealthy countries problems result from misuse or overexploitation of land and a lack of concern for the environment generated through the belief that the problems only arise in the developed countries as a result of their wealth (Hurrell and Kingsbury, 1992).

Where poverty and wealth divide types of environmental problem, their multi-media effects link them. Global warming has been a source of debate for many years but appears to have recently been confirmed as a real threat to our weather systems and thus

to ecological disasters, flooding and further desertification. The hole in the ozone layer has been confirmed and its cause attributed to release of CFCs to the atmosphere. The health implications arising from skin cancers are just one of the reasons why this is a serious concern to all governments. The scarce availability of fresh water is becoming a life-threatening problem in arid countries and is unlikely to be resolved without a region wide overview of the problem. Silting of rivers and pollution of groundwater are each the result of intensive farming practices either by damming for irrigation or by excessive use of pesticides to maximise crops. Silting results in water shortages for countries who rely on river water, downstream of damming projects, or deep underground wells which are being used faster than they can be replenished. Air pollution is causing both local and international environmental problems. Locally air pollution can damage health, corrode buildings and reduce the quality of life for residents. Internationally the effects of air pollution in the form of acid rain can pollute reservoirs and damage forests that could be critical to local economies. Deforestation and habitat loss is a problem for areas where intensive farming practices could eventually lead to the destruction of the land which is being farmed either by overuse of pesticides or by removal of nutrient rich topsoils which are irreplaceable (Harrison, 1990).

1.3.2 Capacity

There is no doubt that environmental problems exist and that some of these problems have the potential to develop and become life threatening. What is doubtful and difficult to quantify is the extent to which the stresses on the environment are reaching capacity

limitations. Thomas Malthus predicted, in the early nineteenth century, that the world's existing resources could not support the rate of increase of its population and that shortages of food and other resources would lead to declining populations by starvation and death. Throughout the 1970's and 80's food shortages and the problems of the Green Revolution are likely to have led to renewed interest in the Malthusian postulate. There is insufficient empirical evidence to conclude firmly whether or not Malthus's predictions are correct. On the other side of the argument is a cornucopian view that environmental conditions are improving and will continue to improve. To substantiate their argument cornucopians cite the examples of increased life expectancy, declining prices in real terms of natural resources such as copper, tin, coal and oil and an increasing food supply in terms of global population. Again there is insufficient empirical evidence to conclude that this view is correct (Tietenberg, 1992).

An increasing amount of work is being done to identify the links between environmental stresses and this has led many to the conclusion that certain environmental problems can currently be resolved but not without creating another. When the environmental movement started in the 1970s many people who were not involved believed it would be a short-lived campaign, which asked that consideration be given to protecting biodiversity. Now, early into the C21st, it appears that the issue of environmental concern is not a short-lived campaign and may in fact be a complete change in people's perception of the world and the way it is used to survive. Much of the promotional campaign literature from environmental pressure groups consists of scaremongering in

order to make the point that the world's resources are limited and this certainly appears to be true to some extent. How much of the campaign data has been manipulated to stress a point is not clear but more independent studies show that there are limitations to the resources that can be taken from the planet without a contingency plan. How more sustainable solutions to mitigating environmental problems can be found and delivered is something that was not really considered by the environmental pressure groups until very recently. Many environmental activists believed that if it was just made obvious that we need to consider in more detail our use of the planet's resources for our own self-survival then the decision makers would take action and the problem would be resolved[6].

1.3.3 Values

Examining the capacity of the planet to support human life is a common approach to take when investigating environmental problems. There is however a different view of the natural environment and the protection which should be awarded to it. Some people believe that every species has an intrinsic value and that as a species which can think, humans have a moral obligation to protect the environment despite the fact that human survival is dependent on a resourceful and healthy environment (Silvertown, 1990; O'Riordan, 1976). Within this view is contained one that species should be protected not because they contribute to our survival as a species but because they reward us with a sense of pleasure derived from their existence. The people who believe that everything

---

[6] Unpublished comment by Sara Parkin at Friends of the Earth Scotland Annual Conference, November, 1995, Dunfermline

has an intrinsic value also believe that humans should minimise their requirements in order to fit in with the world as it was inherited. Other views have a more imperialistic nature and in this case it is believed that man has the right to command nature. However it is debatable whether or not man is able to command nature. In many ways nature commands man by its in-built limitations and ability to exist without man (Silvertown, 1990).

1.3.4 Problem Displacement

Whatever the value stance a person adopts in relation to the environment, the solution of environmental problems is a primary issue behind the pursuit of sustainable development. As has been mentioned above ecology and ecosystems interact to the extent that environmental problems all influence one another and the solution of one problem may not help in any other way other than to transfer the problem to another area, time or resource. Environmental stresses and pollution can be displaced in a number of ways[7]. Firstly there is spatial displacement where emissions can be transported by air to a different area. An example of this was the emission of sulphur dioxide which caused smog in cities, for example the historical situation which occurred in London in the early 1900s (Harrison, 1990). The problem was solved by raising the height of smokestacks so that the problems of smog pollution were no longer evident in cities but transported out to the countryside. A second type of displacement is to another

---

[7] Dryzek (1987) discusses the difficulties of problem displacement at length.

medium. In this case the example again can be demonstrated with sulphur dioxide. Electrostatic precipitation creates acid rain, which then falls out over another country. An example of this is the transfer of sulphur dioxide pollution from the UK to acid rain falling in Scandinavia. A third type of displacement is over time. The example here is the production of nuclear power, for example as an energy source. The resulting long-lived nuclear wastes and their storage is a problem in itself but there are an increasing number of accidents and leaks with serious health risks for future generations (Harrison, 1990). An infamous example of this was the leakage of radiation from a nuclear power plant in Chernobyl in 1984.

The capacity of environmental problems to be transferable has implications for information with regard to environmental threats. It is not sufficient to measure amounts of limited types of pollution or certain areas of environmental degradation worldwide. This is because simple policy changes by governments can result in significant changes to the volume of pollution or environmental degradation measured locally without necessarily changing the overall environmental impact. Alternatively it is possible the changes could either decrease or increase the overall impact. It is not feasible to measure every single aspect of the environment in the hope that when one type of pollution is eliminated we can deduce and measure where a displacement effect might occur.

In recent years the science has concentrated on identifying problems and their direct cause and not in identifying the links between environmental stresses themselves and in identifying the links between environmental stresses and a variety of causes which can themselves be linked. It is not only direct environmental impacts that affect the environment. Socio-economic conditions force both local inhabitants and decision-makers to choose lifestyles, businesses or industries that can have a negative impact on the environment. Slight changes in socio-economic conditions could feasibly impact on the environment in immeasurable ways. The complex linkages between cause and effect make total reliance on hard data for decision-making very difficult. No organisation has enough resources to be able to do this and even if an organisation did, such measurements would be unwieldy. This all contributes to problems regarding a lack of scientific rigour when examining environmental issues and the consequent lack of prioritisation by government of environmental problems.

1.3.5 Solving Environmental Problems

Tackling environmental problems becomes difficult because of the scale on which they exist, the ways in which they affect all people and the diversity of reasons for their existing. It is also difficult to persuade decision-makers that environmental problems are a real threat because of the lack of empirical data available. Many of the problems may be serious but are also long term and their effects may not constitute an immediate and pressing problem until they become irreversible. While scientists have been able to identify the causes of some environmental problems, such as the hole in the ozone layer,

there are many more potential environmental problems that may not become evident until much later. For example, the full impact of toxic waste leakage from landfill sites may not become known for some years. The health problems related to growth in traffic volumes may go unrecorded until they become very common: these problems could include heart problems from lack of exercise, air pollution causing lung problems or other types of problems such as destruction of natural habitats to accommodate the volumes of increased traffic flow. While it is true that the earth does have a limited carrying capacity there is no way of gauging how close we are in certain instances to this capacity. Decision-makers often have priorities of a more immediate nature such as economic difficulties or social tensions. Thus it is difficult to allocate time or resources to something which cannot be quantified and has so little impact in comparison to other pressures that public opinion is often not in favour of environment as a priority either. There is a limited amount of research that links social tensions with environmental problems and as discussed later in Section 1.5 the usefulness of economics in relation to either social problems or environmental stresses is currently under scrutiny.

Sustainable development in the environmental sense is about being aware of the impacts that all the people of the world have on the environment. This is something which decision-makers have yet to choose to exercise power over and bring to account in their policy making and implementation. From one value-perspective, humans have a moral obligation to respect the world in which they live and care for the species present within it. From another value-perspective there are increasing amounts of evidence that certain

social problems can be resolved if a wider view of causes and effects was taken. A holistic vision that accounted for all aspects of problems would be more able to identify measures to resolve those problems rather than the current trend of problem displacement, which most policy makers adopt. If sustainability can be taken as the condition at which a pattern of sustainable development has been achieved, then environmental sustainability would involve identifying links between the state of the environment and social and economic conditions and devising tools which allow policy making to account for the delicate balance of cause and effect. The difficulty of measuring the scale and diversity of environmental problems has already been established. It should also be noted that the policy-makers would need to identify priority issues given constrained resources. This opens the question of valuing the environment, as priorities will be made according to these values.

1.4 Societal Views: Needs

Environmental problems, at first glance, appeared to dominate the set agenda for the United Nations Conference on the Human Environment in Stockholm in 1972. However, non-western governments arrived at the conference with a different agenda. A major issue to emerge from the Stockholm Conference was the problem of poverty in Third World or developing countries (Sandbrook, 1992). When the Brundtland Commission was established, in 1983, it was also intended that it investigated the work being done not only on environmental problems but also on the social problems highlighted at that conference. The Brundtland Commission, in a good position to do

this because of its independent and international nature, could see the political problems that were in some cases either contributing to the social and environmental problems or preventing the solutions from being enacted. As more detail was sought the Brundtland Commission discovered that despite individual people's concerns about environmental problems they felt powerless to do anything about the problems that they witnessed (WCED, 1987). One of the main conclusions from the Brundtland report was that society had a major role in environmental stresses, whether it was as a cause of them or as a victim of them. It is most likely a combination of the two.

Needs can be categorised in many ways but the simplest categorisation is by making the distinction between absolute needs for human survival and relative needs where differences in lifestyles and improvements for opportunities and growth amongst different parts of the population create a relative need amongst the poorest groups. Poverty can be characterised similarly as either absolute or relative. Both categories of poverty are still present in today's world. Each of these categories and their relationship to sustainable development is described more fully in the three sections that follow on absolute needs, relative needs and poverty.

1.4.1 Absolute Needs

Society acts as a support for its communities. Society's role is to provide the cornerstones of existence for its inhabitants that can be translated as meeting people's basic needs. Societies build up in response to communities providing basic needs as a

collective action for themselves. Basic needs include food, shelter, health care, education, transportation, clothing and social security. However every society has different values and the needs which each society, or more locally each community, aspires to satisfy can vary according to the core values of that society. Assessment of basic needs is fundamental to preparation of the public policies of any society. Communities, or individuals, which are lacking in basic needs are poor. Poverty can cover a variety of situations which can range from those people living destitute and in constant threat of hunger and disease to people who may have relatively adequate food, clothing, shelter and the basic minimal level of education but who lack access to the opportunities and amenities enjoyed by the majority in their societies (McHarg, 1977). Poverty can therefore be absolute or relative.

Absolute poverty can be more clearly defined in terms of people living below some quantified standard in terms of what is needed for basic survival and this amounts to a deficiency in people's access to basic needs. Defining the minimum requirements of humans for physiological functioning is a means of identifying basic needs. This would assess the amounts of food, water, clothing and shelter that would enable a person to stay alive regardless of their social and cultural needs. However, while humans may be able to survive having such needs satisfied, there is also a need for this standard of living to be sustained or developed. Having access to services or facilities which allow people to develop to the extent where they can progress beyond basic sufficiency and satisfy non-

material requirements is involved in the satisfaction of a higher level of needs (McHarg, 1977).

The Brundtland report (WCED, 1987) in its definition of sustainable development prioritises the concept of meeting needs but does not clarify that these are basic needs and hence implies that there is a further level of needs which require to be satisfied if sustainable development is to be sought. This could be loosely defined as seeking an increased quality of life. Examples of such needs and the consequent quality of life which is notoriously difficult to measure are a sense of welfare; a sense of equity; a sense of achievement; and a sense of participation (McHarg, 1977). There are more tangible needs at this level, which can include an education standard above its most basic level; employment; recreation and entertainment.

During the early stages of the development of social policy, in the early nineteenth century, the relief of poverty was viewed more as charity than entitlement. Public pressure over a long period of time eventually forced policy makers to recognise that freedom from poverty was a right. Child labour laws, minimum wages and maximum hours of work, compulsory education and public health, social security, pensions and disability allowances in the industrialised nations enforced the right to social welfare. By 1948 the meeting of basic needs was declared a global entitlement in the United Nations "Universal Declaration of Human Rights". Contained within this declaration is the provision that everyone has the right to free development of his or her personality

and to education. These requirements alone imply the provision of more than the basic level of human needs is a fundamental right of any person. In addition to the two examples above the UN Declaration makes provision for the satisfaction of many more needs (McHarg, 1977).

1.4.2 Relative Needs

Absolute poverty and the requirement for satisfaction of basic needs is a problem faced by a significant proportion of the world's population who are largely, but not uniquely, inhabitants of developing countries. In addition to these problems however are the problems of income disparity. In order to gain access to many basic needs, people require an income. The level of this income can be a problem for people whose priorities are the satisfaction of the most basic needs and the higher tier of needs in the cultural and personal developmental sense are neglected as a result of insufficient income. This assumes that people have an income. Some of the groups of people most in need of basic provisions can be those groups that have no income such as children, elderly people or women. In these cases economic statistics may reflect that a given society or community is not suffering problems of poverty but this will conceal the fact that certain groups of the population may be.

Income disparity is also an issue when discussing relative poverty. Relative poverty occurs when people do not have access to the same experiences or opportunities as others in their community. This can be manifested in many ways. For example in some

countries a high level of education can lead to more satisfying employment, but it is only wealthier groups of the community that have access to this level of education. Social conditioning can also impose relative poverty by making certain food types culturally acceptable and therefore imposing a psychological need to consume those food types rather than less acceptable but more affordable food types.

1.4.3 Poverty

Societies that are not meeting human needs have problems with poverty. Poverty is a problem that is not unique to the developing countries. In the USA, for example, about 38 million people (13% of the total population) are poor and a further 11 million are "near poverty" (UNDP, 1991). In cities there are many characteristics common to the lives of poor habitants. These are sub-standard shelter, lack of, or inadequate, water and sanitary disposal services, inadequate health care, failing schools, overcrowding, premature adulthood and a high rate of crime (Tolba and El-Kholy, 1992). Not only does the quality of life of the poor suffer from this situation but the direct and indirect costs to society of supporting such poor communities are very high. In addition there are also the long-term consequences of depriving the underprivileged of their economic potential; the chance to become better educated, better skilled and more self-reliant and society of their potential skills.

The effect on health of poverty is increasingly documented and recognised. Epidemiological studies show that the odds against child survival and longevity are

greater for those city dwellers who are severely exposed to malnutrition, inadequate shelter, poor sanitation, pollution, poor transportation and the psychological and social stresses resulting from socio-economic deprivation. (WHO, 1991). In rural areas the relationship between poverty and health largely depends on agriculture and associated environmental issues. Health depends particularly on the availability and productivity of farmland, forest resources (especially fuelwood) and water resources as well as on health risks from toxic chemicals, especially pesticides. This affects people in both developed and developing countries but the effect is greater in developing countries where rural communities are more dependent on their natural resources for economic and social growth (Myers, 1989).

The problems and the limitations of the social sciences came to the fore once the issue of global warming started to dominate environmental research. As climate specialists, chemists, biologists and physicists all started to analyse the causes of global warming and tried to measure the extent of damage, impose limitations on use of contributing factors and so on. The difficulty arose as to how to stop people using greenhouse gases; how to stop production of carbon dioxide and methane; and how to stop societies logging for timber (useful as a carbon sink) if this was their only livelihood. There were so many uncertainties surrounding the science of global warming that for years the debate was tangled up with how to prove quantitatively that it actually existed. The reasons why the problems of global warming existed in a behavioural sense were not studied and policy makers were left to make their judgement with insufficient

information as to the mechanics of lifestyles and their mutual effect on global warming. The most up to date information suggests that this is a real phenomenon but policy makers are still left with the difficult issue of how to change accepted and long-term behaviour patterns not just of individuals but of industry and business. This then leads professionally to the social scientists whose work is the most suited to reason how best to achieve the desired change in behaviour (Redclift and Benton, 1994).

Traditionally social science has concentrated on limited areas specific to a certain society or culture (Redclift and Benton, 1994). It is now being called on to tackle global issues and devise methodologies for changing global trends and behaviour patterns. In addition to the challenge of changing behavioural patterns is the issue of social deprivation and poverty. Health is negatively affected by poverty, as is the natural environment. While poverty exists, whether it is relative or absolute, people's needs in the present generation are not being satisfied. Without present needs being satisfied, the capacity of future generations to meet their own needs is in jeopardy. In practical terms, if members of the present generation live in poverty as a result of a lack of adequate shelter, for example, this will affect their health. An unhealthy population could feasibly lead to poor concentration and therefore lack of education and unemployment. This will then affect the next generation by perpetuating the cycle of poverty. In order to progress towards sustainable development, poverty requires to be minimised and basic needs satisfied.

1.5 The Economic View

The economists' definitions of growth and development are as follows (Daly and Cobb, 1989):

> Growth: *A quantitative increase in the scale of physical dimensions of the economy, i.e. the rate of flow of matter and energy through the economy from the environment as raw materials and back as waste and the stock of human bodies and artefacts.*
> Development: *A qualitative improvement in the structure, design and composition of physical flows and stocks that result from greater knowledge both of technique and of purpose.*

Approximately twenty years ago futurologists and economic prophets were announcing that the major problems facing tomorrow's citizens would be the use of leisure time (Ramade, 1984). This economic miracle is still awaited but there is significantly less faith in it these days. The definition of sustainable development refers to the process of development that some economists believe is not possible without economic growth (North, 1995; Tietenberg, 1992). There is another school of thought however which believes that it is not necessary to have economic growth in order to have development. The two schools of thought disagree on the issue of whether or not economic growth is unsustainable and environmentally damaging by its very nature. Most discussion in economic circles with regard to the environment debates this very issue and consequently much of this section will also deal with this issue.

Economics at its most basic level is concerned with man's organisation of activities to satisfy basic material needs and non-material wants such as education, knowledge, leisure and spiritual fulfilment. Therefore how humans value their basic needs and non-

material wants is central to the economic debate. This applies particularly when decisions are required regarding development. Economics is a social science that attempts to model individual's and society's needs and wants so that it can generalise conditions and act as policy tool for government. Therefore economics uses a standard unit that relates to every aspect of our lives for ease of interpretation and to aid policy makers who are often faced with difficult choices and need to prioritise. The basic unit that economists use is money. By attaching a monetary value to everything, everything can be compared, contrasted and prioritised.

The following two sections describe a sustainable development perspective on the values applied during economic analysis for decision-making and the limits that some people believe will ultimately stunt economic growth and demonstrate its unsustainability.

1.5.1 Values

One possible difficulty with the use of economics as the only tool for policy makers is the fact that human nature and man's natural tendency to have a spiritual and moral dimension can be viewed as contradictory to the idea of attaching a monetary value to everything. There are however many testaments to the usefulness of this social science. Economic growth has vastly increased the productivity of workers through industrialisation over the last two centuries and the standard of living in the western world has increased dramatically for many people from bare subsistence to relative affluence. Societies have adapted to economic growth by aspiring to higher and higher

standards of living and a marked increase in material wants (North, 1995). In contrast to our marked improvement in material wealth however are the problems that our increased expectations bring. The extent of economic growth has brought with it an increase in individualism and a decrease in social concern (Daly and Cobb, 1989). Some philosophers suggest that this has led to moral decline of humans and some ecologists suggest that our lack of respect for the natural environment on which we depend will eventually lead to the destruction of the human species (O'Riordan, 1976; McConnell, 1965; Silvertown and Jarre, 1990).

The Brundtland definition of sustainable development (WCED, 1987) suggests that humans need development and this implies continual improvement in the quality of life while continuing to meet basic needs but does not specify whether or not this should be achieved through the pursuit of economic growth. To put economic growth in context it is traditionally measured by Gross National Product (GNP). It is frequently and correctly argued that GNP is not a good indicator of total wealth of any given country because it neglects to include wealth in terms of long-term supply of resources, or the ability to continue to produce goods at the same rate (Redclift, 1987). However this argument alone does not mean that economic growth is not compatible with protection of the environment or pursuit of social welfare.

1.5.2 Limits

Economic growth occurs through increases in inputs such as capital, labour, energy and other resources. It can also occur through technological progress, for example by increasing food production through selective breeding of farm animals. There are many debates about limits to growth and the main point made by these debates is that resources are limited and so economic growth cannot continue indefinitely because eventually the limited resources will run out. In the limits to growth study the overuse of resources such as food and energy were combined with increasing populations and a demand for more resources per capita (Meadows et al, 1972). This, it was concluded, could result from the increased individualism, of increasing capital wealth and a want for more. Daly (1980) has suggested that there were limits to economic growth, but of a very different nature to those predicted by Meadows. Daly suggested that an economy could develop without growing and presented two limits to growth that he believed contradicted the principles of sustainable development. These are biophysical limits and ethicosocial limits.

The biophysical limits that Daly refers to are those imposed by the limitations of the natural environment. The finiteness of natural resources would not be limiting if everything could be recycled. For example if when a city produced waste it could be used to release nutrients for growing crops or used as a building material, then the resource which was first used as a raw material could go on to be reused indefinitely. Because of the complexities of ecosystems and the interdependencies of nature it is not

sufficient for just certain separate items to be recycled for those items to be infinite. This is all related to entropy, inherent in the second law of thermodynamics which states that everything moves away from order and towards increasing disorder (Daly, 1980). Therefore entropy prevents complete recycling. The implications of the law of entropy modify the ideal where all resources operate in a closed loop. This ideal suggests that we can always have the same amounts of the fundamental building blocks that make up our resources. However this implies that as our resources are built up and we modify them to suit our uses we are equally able to reduce the resources used to the same building blocks once we have finished with them. It is the second law of thermodynamics regarding entropy that makes this impossible. One example of the law of entropy at work is the chemical changes that occur when hydrocarbons are heated. This can lead to the production of poly-nuclear aromatic hydrocarbons or poly-chlorinated bi-phenyls where the bonds are indestructible, such as those that were released at Seveso causing chloro- acne, a severe skin condition. Thus a new chemical structure has been formed, which so far as the chemist is aware, no process can break down. This is a case in point where environmental degradation occurs because a modified organic is released to the environment and nature is unable to cope with the new, foreign, compounds. This has dramatic health consequences for humans as well as related problems in the natural environment (Harrison, 1990). Such chemicals typically travel into water where they accumulate in the tissues of creatures and plants that are at the bottom of the food chain. These accumulate in body fat tissues and so work their

way up through the food chain accumulating in large concentrations at the top of the food chain.

Ethicosocial limits relate to the ways in which we regard inter- and intra- generational equity. There are two ways in which future generations can be considered: individually or collectively as a society. Economically this attaches a value to our actions and activities as they will affect future generations. Additionally the types and quantities of resources we use can affect the quantities left for future generations to use. How this value is determined has evolved into a whole new branch of economics based on discounting (Pearce and Turner, 1990).

A further limit to growth, which Daly identifies, is that of space as a limitation. Economic growth requires space: to expand, to accommodate increasing stocks of artefacts, people, resources and sinks for waste materials. He goes on to argue that the self-interest and pursuit of infinite wants leads to a weakening of moral distinction between luxury and necessity.

The valuation methods which economics has developed to deal with problems of intergenerational equity are varied and dependent on the ethical values that are attached to other species and future generations. A species can have an existence value attached to it, which reflects the desire of members of the present generation to allow the species to survive, but which does not reflect any desire to use the species either now or in the

future. People who strongly value the natural environment argue that the existence value of a species relates to the intrinsic worth of something regardless of the view that humans take of it, i.e. a value can be attached but its determination cannot be made using the human value of that species. There is another type of value which can be attached to a species which reflects its usefulness to the current generation but which can be extended to reflect the usefulness of the species to future generations. The difficulty in assessing these values can be estimated by explaining how economists have chosen to measure them. The methods that are used can be described as "willingness to pay" and "willingness to receive compensation". Therefore the values are assessed as anthropogenic (based on human values) and individualistic (based on personal preferences). Economic theory suggests that the difference between these two measures should not be great with any discrepancy being attributable to the real income effect associated with the change. However empirical studies suggest that the value attached to a programme or project that leads to a loss of amenity might be greater than that attached to an equivalent gain.

In contrast to the various discussions on limits to growth, some economists believe that these limits are just exaggerated predictions of doom and gloom. There is a growing trend towards free market economies and free trade and nearly all world leaders advocate this. There is a suggestion that it is not just capitalist economies that are dependent on market forces and some socialist economies also have this dependency. However the extent to which a total free market economy is allowed to run modern societies is also

debatable. Certain European capitalist societies still have some form of market intervention such as France's support of the nuclear industry. There are some schools of economic thought, which suggest that economic growth is not just compatible with sustainable development but a requirement for it to be realised (North, 1995).

In these cases the argument is twofold. On the one hand is the argument that economic growth encourages technological innovation and consequently humans can continue to innovate and identify new resources as and when they are required (Tietenberg, 1992). On the other hand is the argument that population growth will be slowed and perhaps even reversed by encouraging economic growth. The logic in this latter case is that women are less likely to have large families if they feel a sense of security and this is achievable by having economic growth. Thus when security is provided, population growth will slow down and the variety of problems which beset developing countries could in part be solved as they frequently result from over population (North, 1995).

Sustainable development is based on the principles of equity around the world in the current generation, the elimination of poverty and consideration for future generations. Economics is currently unable to satisfy these basic principles of sustainable development because it is based on an individualistic approach that does not attach value to all the features of sustainable development. It offers no sense of the community and social welfare that is inherent in sustainable development and consequently cannot function alone as the means to attainment of sustainable development. The face of

economics is changing at a rapid rate and it may evolve to become the very powerful policy tool able to deal with all the factors inherent in sustainable development. However this is likely to require a step back to the Adam Smith school of economics where welfare was an integral part of the social system and an overhaul of the current economic systems.

1.6 Conclusions

Sustainable development attempts to provide a framework for governance decisions that give consideration to environmental issues such as:

- potential resource depletion,
- pollution, both local and transboundary,
- waste management,
- land use,
- water quality,
- habitat loss and biodiversity and
- food supply.

However sustainable development is not just about addressing environmental issues, it offers a way of considering these issues in the context of social problems such as absolute and relative needs. For example, conceptually sustainable development makes links between environmental problems and social issues such as:

- water supply,
- food supply.

- shelter,
- health care,
- clothing,
- transport,
- education,
- sense of welfare and wellbeing,
- equity,
- opportunity for achievement,
- participation in decisions affecting lifestyles and opportunities,
- employment,
- recreation,
- entertainment.

In addition the benefits of economic growth, and in particular significantly higher standards of living and reduction in population growth, should be balanced against the effects that those benefits can have. Such effects include increased individualism and less social concern, increased demand on resources as standards of living increase and the limitations of the natural environment to absorb the waste and pollution arising from increasing production levels. However potential for increased innovation and the effect of increased wealth on slowing population growth are considered to mitigate these effects to some degree. One of the central questions of sustainable development is whether or not the mitigating effects of innovation and increased wealth are sufficient to

create an appropriate balance between economic growth and its effects on social and environmental conditions.

Sustainable development is a highly conceptual idea that attempts to integrate environmental issues into social and economic considerations. The challenge that it poses to decision-makers, such as those in government, to integrate previously unconsidered and potentially conflicting values and issues is a difficult one. Unresolved debate about the role of economic growth in addressing the problems identified by sustainable development considerations is an indication of the complexity of sustainable development. The potentially conflicting options that will integrate these issues suggest that sustainable development cannot be achieved without clear statements on values of those affected by the decisions and strong leadership to balance priorities. Sustainable development provides a framework and an aspiration but it is not a clearly understood concept, as it does not offer a clear, indisputable definition or practical guidance on its implementation.

The concept of sustainable development grew out of a variety of environmental concerns from transboundary pollution to resource issues raised during the oil crises to a growth in personal and community based values relating to the natural environment. Despite this sustainable development is not an environmental concept but as noted above, an attempt to provide a framework for balanced consideration of environmental concerns together with issues related to economic growth and addressing poverty and related social

problems. Sustainable development recognises the interconnected nature of social and environmental problems and of environmental and social problems that are likely to arise as a result of high levels of economic growth.

In recognising the environmental impacts of current activities sustainable development also raises the issue of the timeframe in which decisions that attempt to address social and economic concerns are made. Many environmental effects resulting from such decisions are not evident until much later. For example, the source of acid rain took many years to identify and resource depletion is always perceived to be many years in the future. Impacts of land use on biodiversity often do not become clear until species populations are affected by changes in land use several years later. This form of problem displacement is a significant part of the decision-making process that the concept of sustainable development attempts to address in its reference to taking account of the needs of future generations.

The requirement to take account of needs of future generations raises issues about equity. Inter-generational equity is as challenging a concept as equity between people in the current generation. In both cases the perceptions about equity are dependent on values of people making decisions that affect equity and people affected by those decisions. Equity can be about equitable access to opportunities, to services that fulfil needs, to fulfilment of those needs, equal wealth or equal standards of living. The

definition of sustainable development hints at the desirability of equity to be considered but is not explicit as to how this should be interpreted.

Equity between generations can never be achieved if it is about standards of living since any growth or development that increases standards of living will result in inequity between generations but in a positive way. If the reference to equity is about access to opportunities then again development and growth will create more opportunities making future generations as a whole better off and therefore this is not equitable but desirable. If equity is about reducing relative poverty and reducing the differences in standards of living between different populations across the world, then there is a need to address equity issues at a more localised level. If equity is about access to resources that contribute to increased standards of living then there needs to be more equitable distribution of food and natural resources and such resources need to be priced in such a way as to be more affordable to all. This last option is contrary to current economic systems and would require radical restructuring of trade and pricing of goods systems.

The lack of clarity over the issue of equity as it relates to sustainable development raises the issue of the inherent contradictions that characterise sustainable development. There is possible conflict between equity and economic growth as it is currently managed. There are further potential contradictions already referred to earlier in the chapter. These include a significant contradiction between long and short-term goals and how they can affect the priorities set during decision-making. Both of these potential contradictions

highlight the essence of the conflict between economic growth and environmental considerations, that are characterised by issues about resource consumption and distribution and the values attached to long-term possible problems against immediate and definite problems. A further potential contradiction of sustainable development relates to decision-makers themselves and whether they represent and make decisions on behalf local communities, nations or multi-national groups of countries or other organisations. The level of representation will affect the priorities set and agreed to but it is possible that priorities at one level will not be the priorities set at another level of governance.

The time span of decision-making and its affect on the priorities for sustainable development is characteristic of the uncertainty of sustainable development. Many of the environmental concerns about sustainable development are difficult to measure accurately and consequently the effect of not addressing these problems cannot be quantitatively assessed. There is little certainty on the outcomes of many actions that could be described as sustainable development as a consequence of this. In addition some of the economic based solutions to the problems that sustainable development tries to address rely heavily on the potential of innovation to find technological solutions to many of the problems. There is very little certainty about the solutions that may be found through innovation. As mentioned above, there is also a great emphasis on setting priorities for sustainable development and priorities rely on a clear understanding of values. However the values and priorities at the local level may be inherently different

from those at a national or global level and all are dependent on the range of stakeholders that have a say in the decision-making. Other differences in values occur amongst people considering issues at the same level. The potential differences in values create uncertainty about what priorities can and should be addressed by sustainable development.

Sustainable development is characterised not only by the range of issues that it seeks to address (economic, social and environmental). It is also characterised by:

- the complex features of the interconnected nature of problems across traditional disciplines,
- the longevity of the issues that require consideration,
- the significant role of values,
- the challenge of considering global pressures while addressing local and national ones,
- the challenge of being equitable while seeking economic growth,
- the potential contradictions that arise in trying to address these issues and
- the uncertainty of the outcomes of any efforts to implement sustainable development.

Interests in competitiveness and nations striving to become wealthier fuel the current highly economic basis for decision-making. Business and industry has a major role in increasing wealth and an equally strong interest in becoming more competitive as this

results in greater profits for each business. The next chapter explores the nature of competitiveness and its implications for sustainable development.

The complexity of implementing sustainable development needs first to be addressed at a global level with some basic priorities agreed at that level. There is also a need to develop new tools to support administration of the priorities since the existing tools of economics are not sufficiently holistic to facilitate sustainable development. Agenda 21, a global policy document agreed at the 1992 UNCED (the Earth Summit) was the first effort to agree priorities and engage all governments in implementing sustainable development. The third chapter describes Agenda 21 and to what extent it has achieved its status as a global policy document for sustainable development.

CHAPTER TWO: COMPETITIVENESS AND SUSTAINABLE DEVELOPMENT

2.1 Introduction

This chapter explores the interest that business and industry has in sustainable development with a particular focus on the relationship between sustainable development and competitiveness, the prime motivator of business and industry. One of the core elements of the approach taken by business and industry to sustainable development was founded on principles of competitiveness and key features of competitiveness are described in the second section of this chapter. The third section of the chapter draws from conclusions reached in Chapter One of the thesis to explore the relationship between sustainable development and competitiveness.

The Business Council for Sustainable Development (BCSD) is the recognised world-leading group that represents business and industry views on sustainable development. Formed shortly before the Earth Summit in 1992 with the express purpose of agreeing a common position for this sector of the economy on sustainable development, the BCSD perspective on sustainable development is particularly relevant to this thesis and is presented in the fourth section of this chapter. The BCSD represents large multinational companies and recognising that such companies may operate with different motivations and under different conditions from smaller companies, a fifth section of the chapter compares the perspectives of different sizes of company. In the sixth and final section the key issues about the approach of

business and industry to sustainable development are discussed and the chapter is concluded.

2.2 Competitiveness

All countries wish to increase their wealth as a means of improving their standard of living, and to afford investment in the future. In addition having a wealthy economy enables governments to hold a strong negotiating position in international negotiations[8]. It enables those nations to be world leaders and avoids having to follow targets and objectives set by other nations. Being competitive is seen as the best way to increase wealth (OECD, 1996a). Therefore competitiveness issues filtrate through all decision-making and especially decision-making regarding sustainable development since that is often perceived to be anti-competitive.

Equally competitiveness is very much a driver in business and as such understanding it is important in determining how businesses can be persuaded to act more sustainably. To understand how to make nations and business more sustainable, it is important to understand the framework within which they are operating. Consequently this section presents research into the key issues regarding competitiveness, specifically what makes a nation and an industry competitive and the key factors to consider in pursuing that goal. Identifying the link between national and industrial competitiveness, the key features of each are productivity, trade and innovation and these are described in more detail below.

---

[8] Chapter Three indicates the power of the North in influencing the content of Agenda 21.

2.2.1 National and Industrial Competitiveness

The notion of a competitive nation is difficult to define. There are some countries that dominate globally in terms of standard of living and economic success, such as the United States, Japan and Germany. However there is no single formula explaining their success and no particular group of factors which they all share. Countries find it difficult to assess whether or not they are competitive as well as how competitive.

Reflecting the importance of national competitiveness, there have been many attempts to define the concept more precisely. In general, much like sustainable development, these attempts fall into a number of discipline-led categories. These are 1) the macroeconomic, 2) trade, 3) the industrial policy and 4) the industry led theories. From a macroeconomic perspective stagnant productivity is a major contributor to poor competitiveness. Macroeconomists presume that the markets are sufficiently competitive so that there is little room for discretionary firm behaviour. (Nelson, 1991) This approach is also characterised by a focus on public policies and especially education and infrastructure. The trade economist's perspective is based on the notion of comparative advantage. In this theory nations make factor based comparative advantage in industries that make use of the factors they possess in abundance. The factors themselves are the basic inputs necessary for production: land, labour, natural resources and capital (Porter, 1990). An industrial policy theory suggests that competitiveness can be gained from government intervention and targeting of particular industries through protection, export promotion and subsidies. This is based on the concept of trading in industries for which there is a demand

elsewhere. Finally the industry led theory relating to competitiveness is based on the assumption that if firms changed their working practice they would become much more competitive and in turn makes the home nation more competitive. This theory is based on firm management styles and the productivity of industry (Porter, 1990).

A common theme through each theory is productivity of industry and this is where the inextricable link between the competitiveness of industry and the nation state is most obvious. The above discussion of competitive advantage theories suggests that it is naïve to assume that the nation dominates the ability of companies to be competitive. If it is agreed that national competitiveness is about seeking high and growing productivity to improve the standard of living, then the productivity of individual firms must have some influence on national competitiveness (Sachwald, 1994, Porter, 1990).

Productivity is the value of output produced by a unit of labour or capital. It depends on both the quality and features of a product (which determines its price) and the efficiency with which it is produced. The value of the product is determined by its capacity to be traded and the demand for that product both in the home nation and abroad. Higher national productivity is achieved by exporting goods in which a country has high productivity and importing goods in which that country has low productivity. Sustained productivity growth requires that an economy continually upgrades itself and so that economy requires the ability to compete successfully in entirely new and increasingly sophisticated industries. The quality and features of products are determined by the design and the improvements to quality and features

that will increase the value of the product are often themselves a product of innovation. In summary, the key features of a competitive nation and competitive business, as illustrated in Figure 4 below, are productivity, trade and innovation.

2.2.2 Productivity

Figure 4 below illustrates that there are two features that have a significant impact on national and business productivity. These are the location and what it offers a particular business and the factors that a nation state offers.

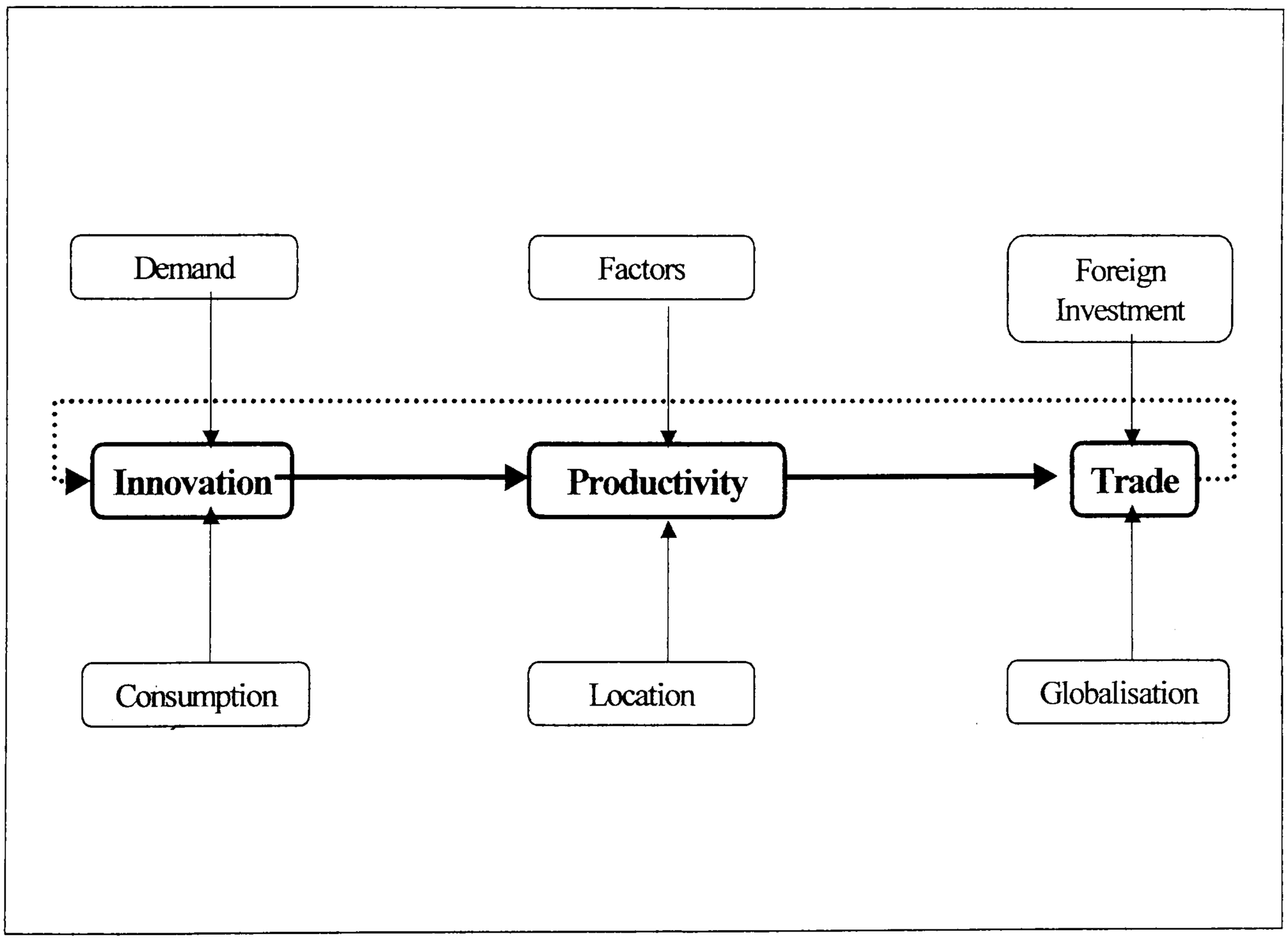


Figure 4: The Key Features of a Competitive Nation

Much economic development activity is based on the assumption that location is an important factor in competitive advantage for industries. Budd (1998) argues that whether gaining competitive advantage is viewed as an industry or a national activity, the attributes and characteristics of an urban area are important. The importance of

location for economic activity and the source of external economies of scale can be described as (Budd, 1998, Porter, 1990):

1. The development of a pooled labour market for workers with specialist skills;
2. The production of a variety of non-traded inputs at lower cost in a location which is specific to industry;
3. The generation of technological spillovers because of proximity of information;
4. Taking advantage of cheap labour. However, Strange (1998) asserts that there are a number of studies that show that foreign firms are apt to pay higher wages and provide better conditions of work than their local counterparts. Strange also asserts that this theory may only be legitimate in resources based extractive operations.
5. The size of the market;
6. The potential to develop relationships with pivotal customers, for example in assembly or manufacturing of high service goods.

A location that can offer customers, markets, an appropriate skill base at a low cost, opportunity for technological innovation and input to the production process at a low cost will all have a positive impact on businesses. The most appropriate balance of these various factors will depend on the type of business in that location.

The issues that make a location competitive are based on the factors that companies require. The factors are loosely categorised as land, labour, natural resources and capital. Land and particularly infrastructure, whether that be physical or electronic, is a major factor in any producing industry. In terms of labour, skills are a key issue. Skills required for highly productive industries are high quality and are created

through higher education and workplace development. Natural resources are specific to each nation state or areas within that and whether or not a nation chooses to take advantage of those resources by encouraging production that utilises them is one of many choices made in creating competitive advantage. Capital resources are products of the governments' choices regarding investment and the investment climate that dominates the private sector in each nation state. Each of these factors are useful to different types of business in different ways and the emphasis put on developing them will reflect national priorities relating to specific sectors of business.

2.2.3 Trade

Free trade is an essential part of competitiveness as it encourages technological advance, exchange of good practice and innovation that benefits competitive advantage. It encourages economic development, through emphasis on inward investment that sites foreign companies in a particular nation. It also offers countries access to goods and services that they may not otherwise be able to produce.

If trade based on international competition did not exist, then the level of productivity attainable in a nation's economy would be largely independent of what was taking place in other nations. However, this is not the case, international trade and foreign investment can both boost the level of national productivity and act as a threat to it. The use of international trade prevents the need for a nation to produce all its goods and services itself, allowing the nation to specialise in production of those goods and services in which its firms are relatively more productive. The nation will then import those goods and services where its firms are less productive

than foreign rivals. This process of trade raises the average level of productivity of an economy.

As indicated in Figure 4 the two main factors that affect trade are globalisation and foreign investment. The increasing globalisation of world economies, through increased trading activity, has made it more difficult for national governments to retain control over economic planning and management of national economies. The impact of globalisation has led to companies having more influence over changes in the world market economy than nations. In addition in Europe the national governments are more concerned with their own national balance of payments and export earnings than those of the European Union as a whole and so national policies are often highly competitive with each other (Strange, 1998). Where nation states now have power is in competing for investments of transnational corporations in terms of providing a large and growing market for goods and services. They also compete in ensuring that their nations, and regions within their nations, have all the facilities, services and qualities required by the investor both for business and quality of life (Strange, 1998).

2.2.4 Innovation

Innovation not only improves technological processes, but also by improving efficiency it assists in enhancing productivity. By seeking ways to improve resource productivity and product development, competitiveness is enhanced in terms of product differentiation, and development of buyer needs (Faucheux and Nicolai, 1998). The pressure to continue achieving more sophisticated competitive advantage

will increase as international trade and the process of globalisation continues. These activities mean that competitive advantage is no longer factor based and the pressure to continually improve through innovation is more intense (Porter, 1998, Scott-Kemmis, 1988).

Some authors see innovation as an invention that is commercially viable where others see that the choice and diffusion of technologies is strongly influenced by political choices, social conditions and economic institutions. One of the major stimuli to economic and technological change is altered social perceptions (including accumulating scientific evidence and hypotheses) about ecological and health impacts of economic activity (Faucheux and Nicolai, 1998). An alternative perspective is the accepted economically focussed definition of innovation, specifically for increased profitability of industry, that has led to its being hailed as a dominant factor in gaining competitive advantage. Several key economists and business theorists have promoted this view since the 1970s including Porter, the OECD, and the MIT Commission on Industrial Productivity (Roberts, 1998). The heavy promotion of innovation as a source of competitive advantage led to governments explicitly promoting innovation policies. In fact, it has been stated that:

> *"The prime aim of innovation policy is positively to enhance the innovative potential of companies..." (Rothwell and Zegfeld, 1988, p19)*

This reflects the pressure that consumer demand has on pressure to innovate and has developed government policy-making regarding innovation from a knowledge driven activity to a market driven activity (Roberts, 1998).

Along with demand the other factor that creates a pressure to innovate is increasing levels of consumption as illustrated in Figure 4. Increasing consumption levels are the direct effect of the increasing sophistication of buyers, which is viewed as an essential component that gives producers their competitive advantage. Increasing consumption of individual consumers is also a key way to stimulate consumers to buy new diversified products, a further requirement to maintain the competitive edge. Stimulation of new buyer needs also stimulates innovation that is again essential to retain or make competitive advantage. Consumption can be increased through incessant technological innovation. The continual release of new and improved products characterises a positive feedback loop driven by the demand for products (Faucheux and Nicolai, 1998).

2.3 Sustainable Development and Competitiveness

There are two fields of work in sustainable development that make efforts to identify ways in which competitive businesses can be more sustainable. Both suggest that it is possible to retain competitive businesses while behaving in a sustainable way. The first of these is the practice of industrial ecology and the second is the theory of ecological modernisation. Each is described briefly below.

2.3.1 Industrial Ecology

Industrial ecology is an industrial practice that attempts to internalise ecological issues within industrial production. Its proponents argue that business is capable of integrating environmental concerns into the production process (Gille, 2000).

Classical industrial ecology is focussed on a product based approach and closely linked to assessments of the life cycle of production of a single product. However many argue that this approach, while helpful in identifying the impacts of producing a single product, does not account for the displacement of pollution or wastes that could occur in a wider system. It is argued that the focus in environmental management must be on the integration of many different products and their life cycles to reduce problem displacement from the system as a whole (Korhonen, 2001).

Contemporary industrial ecology is viewed to have five effects (Desrocher, 2002):

- Reducing the use of virgin materials as resource inputs
- Reducing pollution
- Increasing systemic energy efficiency leading to reduced systemic energy use
- Reducing the volume of waste products requiring disposal, with the added benefit of preventing disposal related pollution
- Increasing the amount and types of process outputs that have market value.

The benefits of industrial ecology in terms of the environment are the reduction of use and reuse of natural resources with subsequent benefits in terms of reduced pollution and waste accumulation. The benefits of this for industrial competitiveness are now being identified. As Desrochers notes:

"A new generation of leading edge managers is starting to recognise that superior environmental performance can confer competitive advantage, rather than undercut it."(Desrochers, 2002, pp 1046)

While the environmental benefits of industrial ecology can be seen in both approaches, the social benefits are less apparent. The product based systems approach recognises the separation of production and end consumption as a driver of societal material flows that results in heavy energy consumption. It also recognises the difficulty in controlling consumption wastes. The aim of the product-based approach is to trace the use of virgin inputs, material and energy throughout the product's life. Therefore, consumption and possibly related recovery and recycling are taken into account, although these activities may take place far away from the place of production and consequently harder to influence. However the geographical approach recognises that in order to more closely mimic natural systems, the optimal path would be to physically connect production, consumption and recycling activities in close proximity with short distances between the actors involved (Korhonen, 2001). Despite highlighting the significant social implications of consumption that industrial ecology could possibly quantify, this is a highly aspirational approach to reducing consumption that seeks to adapt the behaviour of producers and consumers, whilst not recognising industries and consumers many and varied reasons for developing and consuming products.

The capability of either approach to industrial ecology however is associated with the freedom of business to make these decisions and innovations to their processes moving industrial ecology towards a voluntary activity. Typical activities include voluntarily assumed environmental management systems, green accounting and eco design (Gille, 2000). The geographical approach is typically developed by building

eco industrial parks (Korhonen, 2002). Practical examples of these activities are given in Chapter Four.

2.3.2 Ecological Modernisation

Taking a more strategic approach to the relationship between industry and the environment, the emerging theory of ecological modernisation seeks to find a positive and workable solution to the challenges that industry poses for sustainable development. Contrary to the radical theoretical approaches, ecological modernisation seeks to work within the current system of industrial development predominant in industrial countries rather than prioritising ecology in decision making or reducing consumption to an extent that changes the face of modern production (Murphy, 2001).

Ecological modernisation has developed in three commonly recognised distinct phases leading to some confusion over what it encompasses. In short the first phase of its development, responding to the environmental pressures identified during the 1970s, was characterised by a heavy emphasis on the role of technological innovation, a critical attitude to the role of the state and a bias towards market solutions. The second phase from the late 1980s to mid 1990s took a more moderate view of these features and emphasised institutional and cultural dynamics. During this phase, the Brundtland report and the production of Agenda 21 codified processes by which the suggested socio economic and cultural changes might be achieved (Fudge and Rowe, 2001). In the third and current stage the features of consumption, application to non-western European countries, and global dynamics are being

considered to further enhance the applicability of the theory. However, as Mol and Roberts both note the theory remains in development and has not yet crystallised into a stable set of uniform characteristics (Mol, 1999 and Roberts, 2003).

The theory has been developed in the context of western European highly developed countries. The theory is thus built upon the prerequisites for green industrial restructuring such as the existence of a welfare state, advanced technological development, a state regulated market economy and a widespread environmental consciousness (Sonnenfeld, 2000). It is perhaps this evolution and its motives for its first stage of development that has given ecological modernisation a strong relationship to efforts to improve industrial efficiency and resource use. In fact Sonnenfeld suggests that:

> *"ecological modernisation has three immediate and two ultimate technological/ material objectives: in the short term, waste reduction and elimination, resource recovery and reuse and dematerialisation; in the long term, resource conservation and clean production" (Sonnenfeld, 2000, pp237).*

The processes that are typical of this approach to ecological modernisation include those typical of industrial ecology as well as boosting superindustrialisation (Sonnenfeld, 2000). However the strategic approach of ecological modernisation also examines institutional and social dimensions of environmental change. Ecological modernisation seeks to harness the forces of entrepreneurship for environmental gain, thus advocating a shift in policy processes that promote economic efficiency and technological innovation (Gouldson and Murphy, 1996). This shift in policy approach increases the responsibility of the business sector and alters the style of policy making:

> *"from curative and reactive to more preventive, from closed policy making to participatory, from centralised to decentralised, from hierarchical to more consensual, based on negotiations and intensive consultations. The emergence of market based and communicative approaches (voluntary agreement, mediation, negotiated rule making, eco-labelling) illustrates the changing role of state and state policy" (Frijns, Thuy Phuong and Mol, 2000, pp 269)*

However there are difficult decisions that will be required in taking an ecological modernisation approach to sustainable development and there is as yet insufficient evidence about how these are practically dealt with at a national and local level. The zero sum moments approach of ecological modernisation that contrasts with the theoretically popular win-win orientation acknowledges the real and inherent conflicts among stakeholders in this process (Pellow, 2000).

The following sections analyse these theories in more detail exploring them as they relate to features of competitiveness identified earlier in this chapter.

2.3.3 Relationship to Features of Competitiveness

Productivity, trade and innovation, each impact on sustainable development although it is not clear exactly what the impact is and the long-term implications. The sustainability of competitiveness can be understood through five related issues: labour, natural resources, trade, wealth and innovation. The following sections describe each of the features of competitiveness noted above as they relate to sustainable development and the practice of industrial ecology and theory of ecological modernisation. The findings from Chapter One on sustainable development are the point of reference for all conclusions reached on the relationship between sustainable development and competitiveness in this section.

2.3.4 Labour

Labour is a key feature of productivity and as such it is a significant feature of competitive activity. The role of labour and the aspect of it that most increases competitiveness is a highly skilled workforce. These skills can be developed through both a high quality higher education system and workplace training. The more competitive countries will supply a highly skilled workforce, because these workers are likely to be part of more high value and more innovative industry as noted in the previous section.

The relationship between this aspect of competitiveness and sustainable development is simple. A highly skilled workforce has a good education, is attractive to employers and consequently is likely to gain rewarding employment and have a relatively high standard of living. In this area of competitiveness, where it relates to the most competitive aspects of activity by industry and nations, competitive labour markets are compatible with sustainable development. Labour, in this sense, only meets the economic element of sustainable development. It addresses social issues in so far as it encourages education and where, through workplace training, makes provision for it.

Less competitive perspectives of the labour market, for example where producers employ low skilled workers to undercut operating costs only, are not sustainable. This is because such practices do not value skills or encourage education. Equally this method of operation undermines long-term competitiveness of the industry by not enabling it to innovate to remain competitive. It creates a factor-based advantage that

will be surpassed by other industries operating on a principle of demand and innovation based competitive advantage (Porter, 1990).

While both industrial ecology and ecological modernisation are aimed at increasing the efficiency and dematerialisation of production processes, neither has evolved so far as to examine the impact of their application on labour. It may be that such changes in the production processes and increases in reuse and recycling of materials as well as increased dialogue about proposed policy would create employment but no analysis is available to qualify that theory. The strong connection of the European approach to competitiveness and employment has provided a policy platform for ecological modernisation but it is possibly too early to assess the impact of these policies at a national level on employment in relation to sustainable development. The impact of efforts to pursue a knowledge based economy in western European developed countries and the consequent implications for a contracting employment market should also be considered in any analysis of the relationship between labour and ecological modernisation.

2.3.5 Natural Resources

The types and the management of natural resources have a major role in industrial productivity. Although every industry will have a different dependence on natural resources whether that is as a raw material for products or as a fuel for processes, some broad conclusions about the role of natural resources in a competitive organisation and the impact on sustainable development can be reached.

Increasing productivity will also result in increasing use of natural resources to maintain supply. In exploring the complementarity of natural capital and man made capital; Woodwell finds that both renewable and non-renewable resource consumption rise as production grows. Increasing productivity will increase depletion of non-renewable resources unless the effect of increased productivity generates wealth that is applied to the use of more renewable resources to replace non-renewable resources and the implementation of processes that result in increased efficiency (Woodwell, 1998).

Efficiency of natural resource use is a sustainable way to become more competitive. Some reasons for more efficient use of natural resources from a business perspective are that efficient systems pollute less and deplete fewer resources. Efficient systems cost less to operate than inefficient ones. For example, in an efficient system there is no payment for additional resources that will ultimately be wasted and equally no need to pay for pollution clean up when pollution has not occurred. Efficiency savings mean that companies can use money, which has not been wasted on inefficient operation, on other aspects of their business and its development. However as efficiency savings are made and businesses develop there is a risk that further resources are put into innovations such as development of new products and increasing consumer demand. Consumption and demand for products is not an aspect of sustainable development that efficiency savings can benefit (Von Weizacker et al, 1997).

Technology growth is driven by production and so as production rises, investment in growth and technology rise proportionally (Byrne, 1997). There are various models predicting the outcomes of many scenarios relating technological innovation to sustainable development. One of these demonstrates the possibilities for increasingly replacing resources with improvements in technology. Production grows indefinitely, falls gradually or may drop suddenly depending on the specification of the technology term (Woodwell, 1998). New innovation or information may enable easier methods of transforming low entropy resources into products serving human needs, but a note of caution is required since that new information may also reveal new limits (Daly, 1995). To generalise, technological innovation may create more sustainable products or ways of using those products but the details need to be reviewed on a case by case basis.

Resource use can be inequitable for current and future generations. A dependence on the use of natural resources, which is anti competitive in the home nation according to Porter (1990), can be considered inequitable for the current generation if those resources are being used by other nations to the disadvantage of the home nation as a result of competitive pressures. Resource use can also be considered inequitable for future generations if those resources are used in a non-sustainable way without consideration for future supply. Developing countries are the most likely to suffer the consequences of this problem. Typically developed nations use the natural resources of another country to meet the demands of its population. The country from which the resources are extracted may not be in a position to provide its population with the same standard of living.

Such inequities can only be resolved at the global negotiation level and yet at this level the dominant negotiators are those countries that retain the wealth through competitive advantage. Thus the countries whose economic progress is threatened by such countries use of their own natural resources are in a weak position, because of their lack of competitive advantage, to negotiate their way out of this position.

To summarise, increasing productivity, which is competitive, will likely result in a mix of sustainable and non-sustainable outcomes. Non-sustainable outcomes are an increased depletion of non-renewable resources and inter- and intra-generational inequity. However sustainable outcomes are increased efficiency in resource use and consequently better management of waste and pollution and potentially a positive feedback into the competitiveness process through increased wealth generation and innovation. However innovation may lead to increasing consumption levels or replacing non-renewable resources by improvements in technology. The way in which resource use is addressed will determine whether or not it is sustainable.

The practice of industrial ecology is focussed on dematerialisation and efficiency in resource use thus indicating a compatible approach with reconciling sustainable development and competitiveness. However Ehrenfeld warns against a complacent attitude to perceiving industrial ecology as a sustainable solution to natural resource use. He argues that even if sufficient recycling of material were taking place, there will be an eventual dissipation of materials, like energy, through use (Ehrenfeld, 2000). It is also possible that having the capacity for high levels of materials

reprocessing may lead to the understanding that source reduction of materials is not required, which would ultimately, if dissipation occurs, lead to an extinction of non-renewable resources (Gille, 2000). Ehrenfeld and Gille both argue that even with continual increases in efficiency of production there are insufficient efficiency improvements to achieve necessary levels of dematerialisation given the rate of growth in global development and the consequent growth in consumption (Ehrenfeld, 2000 and Gille, 2000).

Ecological modernisation shows significant parallels to industrial ecology in relation to resource use. The theory has a strong foundation in reducing resource use, encouraging clean technologies, efficiency in production and innovation for dematerialisation as well efficiency (see for example Sonnenfeld, 2000, Murphy, 2001, Fudge and Rowe, 2001 and Roberts, 2003). Pellow however notes that a focus on recycling can detract from other more sustainable options for waste management indicating the limitations of a dependence on this aspect of ecological modernisation (Pellow, 2000).

The link between industrial ecology and ecological modernisation is strongest in a discussion about resource use, perhaps a reflection of the priorities of the two theories. In discussing potential non-sustainable implications of industrial ecology, several authors conclude that the technical challenge of planning resource recovery in firms is not actually the most important task facing such professionals. In fact the development of an institutional framework that forces firms to internalise their externalities while leaving them the necessary freedom to develop new and profitable

uses for their by-products, thus requiring co-operation between state and industry, is viewed as a more important priority (see for example Desrochers, 2002, Gille, 2000, Sonnenfeld, 2000 and Ehrenfeld, 2000). This argument is also elaborated on in the context of a discussion about the displacement of environmental problems using the specific example of the paper industry in Finland, suggesting that the lack of a strategic and holistic perspective in recycling wastes may create additional environmental problems (Korhonen, 2001).

In addition to requiring a holistic policy approach the nature of sustainable development issues in resource use also need to take consumption into account. Spargaaren and Van Vliet make the link to the influence that policy implementation can have on personal choices affecting levels of consumption (Spargaaren and van Vliet, 2000). However the theory of ecological modernisation is only beginning to take this aspect of resource use into account (Murphy, 2001 and Spaargaren and van Vliet, 2000). Ecological modernisation however will require a much more complex approach to dealing with consumption than either the requirement to consume less (as it advocates superindustrialisation) or the technological approach (which is recognised as insufficient above).

Ecological modernisation goes further than industrial ecology by its focus on institutional frameworks and policy. However it encompasses the efficiency and innovation features of industrial ecology. Despite the broad aspirations of ecological modernisation, it has so far failed to address the most challenging issues of reconciling sustainable resource use and competitiveness, i.e. displacement of

resource use, production and disposal causing inequity across countries and for future generations, the impact of innovation in increasing production and consequently consumption and how sustainable behaviour can be encouraged.

2.3.6 Trade

It can be argued that in the course of trade, pollution and environmental damage will transfer across from more advanced to less advanced nations. Present North-South trade boosts the risks of land deterioration and accelerates degradation of ecosystems in the Third World (Giempetro and Mayumi, 1998). The process of development that is encouraged by free trade amplifies initial advantages that then result in ever-increasing gaps between developed and developing countries if corrective polices are not applied. These initial advantages are related to cheap labour supplies, low pollution abatement costs and low skill production.

> *"International trade can exert an important influence on the environment via its effects on the composition of domestic production activities. Countries with less stringent environmental regulations may have comparative advantage in dirty industries." (Lee and Roland Holst, 1997, p65)*

This situation is neither competitive in the long-term nor sustainable. There is evidence to support the move of pollution intensive industries away from developed countries to developing countries. Standard trade theory in fact suggests that under free trade, developing countries would specialise towards the production of goods which are intensive in the use of labour and natural resources: factors they are endowed with in relative abundance (Porter, 1990). When those poorer countries come to apply environmental regulations they will be forced to develop pollution abatement, there being nowhere else for the dirty industries to migrate (Stern, Common and Barbier, 1996).

Companies will move abroad not just for cheap labour and low pollution abatement costs but also for technological change. The accelerating pace of technological change in products, processes in production and marketing and systems of management have forced firms to seek new markets, whether for goods or services abroad. Their ability to raise capital and their access to advanced technologies make foreign firms attractive to developing countries. The lack of exclusionary barriers in developing countries, such as exchange controls present in developed countries, made the developing countries attractive to firms. Strange uses this argument to explain the shift of manufacturing production to developing countries. When this shift is combined with the substitution of technologies for manpower, the effect on developed countries' levels of employment has been dramatic (Strange, 1998). Shifts in production from developed to developing countries has left developed countries trying to compete in new ways, e.g. in service based industries. It has also created pressures on welfare and has led to high unemployment levels.

Globalisation is a result of increasing trade and nations will increase productivity to retain competitive advantage in this growing market. The pressure for competitiveness is such that nation-states will continue the pressure for productivity growth whether this takes place in the home nation or abroad. Increases in productivity growth will have a positive effect on the economic sustainability of nation states but not necessarily environmental sustainability. Globalisation has the effect of increasing production, encouraging migration of dirty industries and increasing innovation. Trade barriers to prevent the relocation of dirty industries

have a negative effect on welfare even where they are designed to reduce environmental impact (Markusen, 1997). With the exception of increasing innovation that has the potential to produce sustainable goods and reduce dependency on natural resources, the main effect of globalisation is to move and enhance problems relating to sustainable development, not resolve them.

Ecological modernisation encourages dematerialisation in western countries. There is the possibility that this approach may result in increasing materialisation in developing countries as consumption increases. The south-east Asian pulp industry is a demonstration of how industrial modernisation, making significant efficiency improvements in developed countries, is having the effect of significantly increasing both absolute and relative use of raw materials in a developed country (Sonnenfeld, 2000). Eastern Europe too is suffering the negative impacts of saturated markets in Western Europe for incinerator technologies with the outcome of decimating incentives for reducing and reusing wastes (Gille, 2000). This concern is echoed by Fudge and Rowe, who state that the advantages to be gained by ecological modernisation are increasingly vested in the knowledge classes, emphasising societal divides and leading to a new technocracy (Fudge and Rowe, 2001). This implies that ecological modernisation as it is currently envisaged will have negative impacts on equity as a consequence of its non-global approach and focus on western European countries to date.

It is also possible that ecological modernisation could have a positive impact on trade by encouraging the exploitation of first-mover advantage in the growing global

market for environmental technologies (Gouldson and Murphy, 1996). Newly industrialising countries too have the advantage of being able to "leapfrog" technological developments while benefiting from inexpensive labour and raw materials. Resource extractive, export-oriented industries would be in the best position to take advantage of this situation (Sonnenfeld, 2000). However, in the context of the impact on welfare in developed countries and increasing resource use, the true cost of this approach requires more assessment.

2.3.7 Wealth

Increases in wealth, generated by increases in productivity at a national level, can contribute towards greater environmental protection, conservation of resources (including biodiversity and natural environment protection) and improved management of resources. Similarly it is possibly that increased wealth will reduce the need for social welfare while increasing the provision of services that meet social needs such as health, shelter, food and fuel supplies. Also increased wealth at a national level may increase opportunities for advanced educational opportunities and increased employment opportunities. The only aspect of wealth creation that can be described as non-sustainable is the impact of the process of wealth creation on social and environmental concerns relating to distribution (including potential inequities of distribution) once wealth has been generated.

The first stage of ecological modernisation, with a heavy emphasis on technological change and a strong bias towards market mechanisms, is attractive to public sector economists because the approach has proved socio-economically fruitful and because

the heavy burden of the costs of the welfare state seem soluble only through market solutions (Fudge and Rowe, 2001). Consequently, ecological modernisation has the capacity to generate wealth that could be applied in a sustainable manner by applying the first stage. Unfortunately this stage of ecological modernisation appears to be inadequate in finding holistic solutions to sustainable development as discussed earlier. In a study on the application of ecological modernisation in Sweden, Fudge and Rowe note that the benefits of efficiency, resource conservation and recycling are being outstripped by the pace of social and cultural change finding further fault with only applying this early stage of ecological modernisation (Fudge and Rowe, 2001). Others find that social considerations fail to be recognised when they try to apply ecological modernisation to practical examples (see for example Gouldson and Murphy, 1996, Gille, 2000, Sonnenfeld, 2000 and Pellow, 2000).

In a study of regional development programmes, Roberts notes that there is some possibility that social concerns are considered in ecological modernisation applications refuting criticisms made by many other authors (Roberts, 2003). However this may be a consideration unique to and a consequence of the social motivations behind the design of such development programmes.

2.3.8 Innovation: Consumption, Demand and Efficiency

One of the main effects of innovation, as stated in Section 2.2.4, is to increase the demand for new products and the consumption of new and diversified products. There is both a benefit in increasing total consumption and a cost (total consumption equals per capita consumption times population). The benefit is economic services

gained and the cost is ecosystem service sacrificed (Daly, 1995). As more natural resources are used in producing more goods to service increasing consumption levels, more waste and pollution are also generated which impacts on ecosystems and alters their ability to produce the same raw materials at the same rate. Extraction of non-renewable resources is a specific example of how this is unsustainable.

Increasing levels of consumption are viewed by many as one of the fundamental problems preventing successful implementation of sustainable development and a key factor responsible for inequity, especially between North and South. In particular, consumption of increasingly sophisticated goods relies on increasing use of natural resources, if not to produce the goods then to operate them. The reports that refer to limited resources suggest that the human population in developed countries is living beyond its means, living on the capital and not the interest. Studies such as the Limits to Growth (Meadows et al, 1972) and more recently Our Ecological Footprint (Wackernagel and Rees, 1996) conclude that if all of the world's population were able to consume services and goods at the same capacity as those living in developed countries then there would not be enough for everybody. When it is considered that sustainable development is partly about bringing living standards in developing countries in line with those in developed countries, which includes achieving the same levels of consumption, then the issue of sustainability becomes crucial to the debate. The scale of the problem becomes evident when it is considered that in addition to increases in levels of consumption in developing countries there will also be significant increases in population (Meadows et al, 1972, Wackernagel and Rees, 1996).

The role that innovation has in creating increased consumption and demand is non-sustainable in relation to its environmental impact but can be sustainable in its effect on economic factors such as employment creation through increased productivity. The role of innovation in improving efficiency will have a sustainable effect on the environment, as described in an earlier section. The role of innovation in creating new and more sustainable products is potentially sustainable but heavily reliant on demand for such products either being created or existing already. Innovation can be classified into two types: one that increases consumption and demand for products and another that increases efficiency, reduces dependency on non-renewable natural resources and potentially produces products for more sustainable lifestyles.

Ecological modernisation is about both innovation in technologic advancement and the modernisation of policy and management processes. Technological innovations should not remain limited to the technological dimensions of one product, but include higher aggregation levels, production-consumption chains and economic networks and organisational adaptations of socio-technological complexes (Mol, 1999). Policy makers should be wary of the less sustainable outcomes of innovations in process that can sometimes result from single product approaches, such as Chicago's Blue Bag system analysed by Pellow et al., which had significant negative social implications (Pellow et al, 2000). Production is only one aspect of innovations and new products will need to fit the time-space routines of modern life (Spaargaren and Van Vliet, 2000).

Institutional change can reduce the risk of technological innovations by providing a framework for such developments. It will however be inherently conservative and therefore a slow incremental process. It is arguable that this change process may not be radical enough to enact the necessary changes (Gouldson and Murphy, 1996 and Murphy, 2001). Such innovations should move policy making away from hierarchical approaches, increasing flexibility and the involvement of non-state actors via negotiations, market mechanisms and self regulation or voluntary agreements (Mol, 1999). There is the possibility that an ecological modernisation approach could achieve significant progress towards sustainability under this model. However Fudge and Rowe's study of the application of ecological modernisation policy in Sweden has not demonstrated success in this context (Fudge and Rowe, 2001). The policy approach taken in Scotland is analysed in later chapters.

2.3.9 Overview of Relationship between Sustainable Development and Competitiveness

The discussion throughout section 2.3 comparing features of industrial ecology, ecological modernisation and sustainable development with features of competitiveness has been summed up in Table 2.1 below. In effect all features of the practice of industrial ecology can be described as part of ecological modernisation and as such industrial ecology is not mentioned in the table in order to retain clarity. Ecological modernisation too can be incorporated into the theory of sustainable development but does not cover all aspects of sustainable development. Thus in all cases where ecological modernisation has an impact on competitiveness, sustainable development also does. The converse however is not true, aspects of sustainable

development theory can have a bearing on competitiveness where ecological modernisation does not.

The table distinguishes between the two theories using tonality. Ecological modernisation, as a developing theory, at a more advanced but less robust stage of development tackles some aspects of competitiveness more thoroughly than others and this advanced and first stage distinction is also drawn out using tonality in the table. In fact the first stage of ecological modernisation is broadly equivalent to industrial ecology. Consequently the table has the lightest tone where only sustainable development theory applies, darker tone where advanced ecological modernisation applies and the darkest tone where only first stage ecological modernisation has a bearing on competitiveness, remembering that in the latter cases, sustainable development also has an impact on competitiveness, encompassing the advanced and first stage of ecological modernisation.

For both sustainable development and ecological modernisation, the impact that each theory has on competitiveness varies from an incompatible one, through one that requires management to be compatible and to one that is naturally compatible. This variation is the same for each theory given the close association between ecological modernisation and sustainable development. The variation is reflected in the table using colours. Purple indicates incompatibility; blue the requirement to manage for compatibility; and gold indicates a natural compatibility. Blank cells within the table exist where insufficient data exists to draw conclusions about the compatibility or

otherwise of the theories of ecological modernisation and sustainable development with competitiveness.

Features of Sustainable Development	Features of Competitiveness: Labour	Natural Resources	Trade	Wealth	Innovation Consumption and Demand	Innovation Efficiency and Sustainable Products
Conservation of Resources[9]						
Management of Resources[10]						
Social Needs[11]						
Economic Needs[12]						

Table 2.1: Reconciliation of Sustainable Development and Competitiveness

Code:

Natural Compatibility
- Sustainable development only
- Advanced ecological modernisation
- First stage ecological modernisation

Manage for compatibility
- Sustainable development only
- Advanced ecological modernisation
- First stage ecological modernisation

Incompatible
- Sustainable development only
- Advanced ecological modernisation
- First stage ecological modernisation

Broadly the results displayed in Table 2.1 indicate unsurprisingly that the main area of compatibility is in regard to economic goals of competitiveness. The weakest area of compatibility is in relation to social issues with only the wealth and related increased consumption generated from competitive activity really tackling this aspect

---

[9] Conservation of resources in this context relates to biodiversity, habitat preservation, the capacity of the natural environment to absorb pollutants and land use as it relates to the natural environment.
[10] Management of natural resources relates to extraction of natural resources at a rate above their natural replacement rate, pollution and emissions arising from use of resources to any media (air, water and land), waste arising from use of resources and management of global commons.
[11] Social needs include basic needs such as food, health, shelter, clothing and more relative needs such as sense of welfare, achievement, equity and recreation and entertainment.
[12] Economic needs are education, transport including infrastructure, employment and wealth creation.

of sustainable development. A sustainable approach to labour could also be competitive. The area with the most complex relationship between sustainable development and competitiveness is in relation to natural resources. In this case the sustainability of the use and management of natural resources is dependent on the situation and circumstances of the application. It is the non sustainable and the conditionally sustainable aspects of sustainable development that will become the subject for investigation in seeking policy solutions to the reconciliation between sustainable and competitiveness in later chapters.

The first stage application of ecological modernisation refers to applying only its first phase of development, i.e. with a strong focus on technological innovation. An advanced application of ecological modernisation relates to applying the theory in its later stages of development where more consideration is given to holistic approaches and to increasing the consensus building approach between government and industry. This more advanced theoretical approach to ecological modernisation is less well developed and has certain weaknesses when set against the framework of sustainable development. Earlier analysis also indicates that it's practical application has not yet been possible, unlike the first stage approach to ecological modernisation.

In the conservation and management of natural resources the theory of ecological modernisation has the same impact on competitiveness as sustainable development. The extent of this impact does however vary through the advanced and first stage applications of ecological modernisation. The first stage aspects of ecological modernisation are the competitive use of natural resources, generation of wealth and

innovation as it relates to efficiency and development of new more sustainable products. This aspect of innovation will naturally reconcile sustainable development and competitiveness, whereas for wealth and the conservation of natural resources the correct policies will be required to manage reconciliation between a sustainable outcome and a competitive approach.

Natural resources, both in terms of management and conservation, need to be managed, through well-considered policy application, for a sustainable outcome in relation to trade. Such measures require more thought than they have currently been given in ecological modernisation literature since ecological modernisation only partly addresses trade through the local development of industrial eco-parks. Ecological modernisation has so far failed to address the international effects of trade and globalisation in a sustainable manner and is consequently weaker than sustainable development theory in this respect. The effects of innovation in relation to increasing consumption and demand do not reconcile with sustainable approaches to the management and conservation of natural resources. Here too ecological modernisation theory is weaker than the sustainable development framework.

The relationship between labour and sustainable management and conservation of natural resources has not been conclusively researched and little data was available.

The advanced application of ecological modernisation has potential to address a sustainable approach to wealth generation and innovation as it applies to consumption and demand. However this aspect of the theory needs more

development as the practicality of applying the theory has not really been explored. It would likely be applied by setting policies that redistribute wealth to address social inequities and by encouraging more sustainable consumption and demand patterns, for example those innovations that meet the space-time lifestyle issues of changing culture in a sustainable manner. Ecological modernisation has not developed its application to the social aspects of sustainable development and Table 2.1 demonstrates this in particular in relation to creation of labour, development of an increasing skill base and the equity in natural resource extraction and use. Natural resource use could be unsustainable through the potential materialisation impact of trade in developing countries to meet increasing consumption and demand in developed countries.

Unsurprisingly the economic aspects of ecological modernisation and sustainable development are naturally reconciled with a competitive industrial approach. The only aspect of this relationship that will need further development is in relation to the impact of innovation on consumption and demand where a sustainable outcome may need managed through policy approaches. Ecological modernisation theory is not well developed in this regard. Sustainable development theory too is starting to explore this in more depth.

2.4 Business Council for Sustainable Development (BCSD)

Fundamental to economic growth is the activity and success of business and industry. Global environmental agreements that penalise business and industry may have an

adverse effect on economic growth. The Brundtland report recommended that a global conference take place to seek solutions to sustainable development. The United Nations (UN) implemented the recommendation in 1992 by running the United Nations Conference on Environment and Development (UNCED). The Brundtland report also noted that economic growth was a significant part of sustainable development. As such the UN appointed a special advisor to engage business and industry in the preparatory dialogue for UNCED. In doing this, the UN asked for a report that reflected business and industry's view on environment and development. The UN's second objective in appointing a special advisor was to encourage the private sector to become more knowledgeable about and enthusiastic over the Earth Summit's main theme of sustainable development (Timberlake, 1992). The WCED had a vision of a new era of economic growth based on policies that sustain and expand the environmental resource base and thus the business and industry sector's understanding of sustainable development was essential. The special advisor was Stephan Schmidheiny, a leading industrialist.

Schmidheiny reacted by accepting the invitation and establishing the Business Council for Sustainable Development (BCSD) to deal with both of these objectives. BCSD membership was at chief executive level and almost all of those who were asked joined. Membership included leaders of companies such as Dow, DuPont, Ciba-Geigy, Shell, Chevron, Norsk-Hydro, TransAlta Utilities, Nippon Steel, ALCOA, Volkswagen and Nissan. To contribute to the Rio negotiations the BCSD prepared a document entitled "Changing Course: a Global Business Perspective on

Development and the Environment", which was published in 1992 shortly before the Earth Summit (Schmidheiny with BCSD, 1992).

The formation of the BCSD gave certain sectors of business and industry the forum to mitigate potentially anti-competitive environmental and developmental agreements. The reasons for the high level of interest in UNCED by business and industry echo the approach that business and industry has taken towards environmental agreements. Concern over potential restrictions on resource use, consumption patterns, free trade and potential for increased regulation fed on business and industry's perception that such restrictions to business activity are not competitive (Chatterjee and Finger, 1994). Consequently the BCSD's approach to sustainable development and the discussions at UNCED were based on principles of competitiveness. The BCSD chose factors that they perceived promoted industrial competitiveness rather than regulation and promoted these in an environmental context at UNCED. Such practices include innovation, pollution prevention, total quality management, efficiency, free trade and flexibility as discussed in the BCSD report (Schmidheiny, 1992). The BCSD made no efforts to address social issues in its report with the single reference to social issues being in one of 38 case studies intended to demonstrate their perspective.

The only one of thirty-eight case studies documented in the part two of the BCSD report (Schmidheiny, 1992) to mention social responsibility was the one presented by the Shell Petroleum Development company of Nigeria. Shell presented a case study of human resources development where through sponsorship and training, the

company has significantly increased the proportion of Nigerian nationals working at Shell in Nigeria. The company learnt that:

> *"Investment in technical training pays dividends for the company, for individuals involved and for developing countries in general; the localisation or regionalisation of corporate staff can occur without compromising corporate quality or safety objectives; investments by multinational corporations can make significant contributions to local development objectives"* (Schmidheiny, 1992, pp204).

However, Shell's Nigerian operation still has problems with human rights abuse as has been highlighted in the press[15]. The corporate defence for not being proactive in being socially responsible is the need for a level playing field so that all competitors will be forced to comply with the same standards of behaviour (Smith, 1992). This is exactly what the BCSD is arguing against in the context of setting environmental standards.

The theory of ecological modernisation does not really address a responsible role for business, rather exploring options that build consensus between industry and government on certain issues and by encouraging the increased use of voluntary agreements and market mechanisms. This approach is compatible with the approach suggested by the BCSD and may in fact have been influenced by it. A comparison of the applicability of voluntary agreements, market mechanisms and regulations in regard to sustainable development is undertaken in Chapter Three with practical example of each approach detailed in Chapter Four. Each of the BCSD promoted practices is assessed in the following sections.

---

[15] See for example PIRC, 1996

2.4.1 *Innovation and Pollution Prevention*

While recognising that food shortages exist and could become more pronounced as populations continue to increase, the BCSD takes the view that this is simply a distribution problem. More than sufficient quantities of food are produced but they are not efficiently distributed. As populations increase the BCSD argues that improvements in technology will result in sufficient food production. In order to allow the necessary improvements in technology to be made the underlying implication in "Changing Course" (Schmidheiny, 1992) is that given the freedom to innovate, business and industry will be able to find these solutions. However the BCSD report seeks to confirm that public policy will create an environment that stimulates innovation.

In its chapter on innovation, the BCSD focuses on cleaner processes through pollution prevention stating that:

> *"The precautionary response to burgeoning pollution problems is to seek to prevent pollution before it happens"* (Schmidheiny, 1992, pp99).

Many companies view such pollution prevention as having great potential for improving environmental and economic efficiency. Pollution prevention can take the form of good housekeeping, materials substitution, manufacturing modifications and resource recovery. Of these methods, good housekeeping requires attention to detail and constant monitoring of raw materials flows and impacts. Materials substitution, especially for hazardous materials can be relatively straightforward and profitable in some processes but does often imply restructuring for both producers and consumers. Manufacturing modifications and resource recovery both require changes to the

process of production and work in identifying those changes. However the financial gains can be significant.

2.4.2 Quality Management and Efficiency

The quality revolution demonstrated the ability of business and industry to manage fundamental changes in planning and action. The uptake of the use of quality management moving towards increased quality while lowering costs demonstrates that business and industry are prepared to make changes to the way their business is run without regulatory pressures. The continuous improvement cycle typical of quality management systems can be translated into improvements in efficiency and competitiveness. Application of such a process to resource use and energy use effectively becomes an environmental management system. The BCSD reported widely the expertise of business and industry in managing corporate change through TQM and states that these experiences are directly applicable to the kinds of changes required to attain sustainable development. As the BCSD states:

> *"Our ability to forge effective relationships with all stakeholders, including governments, will allow the market to be engaged and our creative talents to be used in husbanding environmental resources."* (Schmidheiny, 1992, pp96)

This reinforces the BCSD view that efficiency is all that is required to meet sustainable development goals.

2.4.3 Free Trade

Trade, say the BCSD, is a requirement for development without which governments cannot afford to protect their environments. The attention to the linkage between trade and environmental policies reflects a number of factors. There is concern by the BCSD over the possible misuse of trade measures for protectionist purposes.

There is concern that environmental policies may give rise, even unwittingly, to distortions of trade or may use trade instruments that do not conform to international rules and disciplines on non-discrimination. Further concern exists over competitiveness when environmental standards differ between countries, with pressure groups often calling for trade policy measures in order to protect cleaner domestic producers. On the other side of the argument there is interest in potential for the use of trade policy instruments as a restriction or incentive with which to encourage participation in international environmental agreements and the avoidance of free riders. There is also a possibility that trade policy can have positive as well as adverse effects on the environment (OECD, 1992). However the BCSD is very much in favour of free trade and states that trade cannot and should not be made an integral part of the foundation of sustainable development by internalising environmental costs. National governments are expected to place an adequate value on their environment and resources through regulations, legislation, use of standards and use of economic instruments. Despite noting that national governments, in the view of the BCSD, should be responsible for internalising environmental costs, the report notes that nations should not punish other nations for selling exports at less than their environmental costs.

> *"Internalising costs is a domestic responsibility and also a goal to be moved towards internationally through methods other than trade"* (Schmidheiny, 1992, pp80).

The BCSD drive for completely free trade is enhanced by a further discussion on protectionist policies. Protectionist policies have been used extensively amongst developing nations.

"While some of this may have been necessary, such strategies isolated the new industries in many countries from competition and thus from innovation" (Schmidheiny, 1992, pp78).

Presenting the argument in this way suggests that increased innovation that creates the necessary technology to tackle current environmental pressures may be hampered without full and free trade. In addition it is suggested that only by building national competitive advantage, through export led approaches to industry, can countries ensure development.

Throughout the discussion regarding trade it is made clear that trade should not be affected by any constraints even in the case of environmental danger. This is reinforced by expression of the view that trade is more important than environmental protection and that:

"Consideration should be given to whether trade measures are strictly essential for achieving a given environmental goal. If so, measures that distort trade and competition the least should be implemented" (Schmidheiny, 1992, pp76).

In addition to emphasising that trade distortion should be avoided if at all possible, the BCSD recommends that for cases where GATT (now the WTO) is required to address environmental issues, certain fundamental principles should be applied. These should include international transparency, scientific legitimacy, and proportionality or use of minimum possible trade measures.

2.4.4 Flexibility

For a competitive business, government controls by use of market mechanisms form a more efficient and flexible method of influence than legislation or regulations in the view of the BCSD. While market mechanisms may internalise the hidden costs of

environmental policies, there is also an argument that regulation is cheaper in terms of monitoring and enforcement for diverse emission sources, and is more certain in terms of the effects of regulation on environmental quality (OECD, 1992). Again as with the strong emphasis on free trade the BCSD is suggesting that national use of economic instruments will provide sufficient control over business and industry for the necessary levels of environmental protection. The common criteria which links all types of market mechanisms is government intervention in the market place. The BCSD is therefore putting responsibility back to governments at a national level for protection of environmentally damaging activities.

2.5 Differences Between TNCs, SMEs, and Other Companies

The solutions that the BCSD presented at Rio for progress towards sustainable development were endorsed as making good business sense. The BCSD asked for a free trade environment, with national governments responsible for attaching values to its environmental resources (e.g. through setting regulations, standards or market mechanisms). In this environment any business is free to make choices towards improving its efficiency, location, use of resources and continuous improvement to methods of achieving its goals through innovation. In a flexible climate, changes that improve the efficiency and thus the competitiveness of any business will be straightforward. However it is reasonable to assume that even in such a favourable economic climate other factors will exist which either aid or hinder an individual company's ability to improve its competitiveness in this manner.

Transnational Corporations (TNCs) are perhaps in the best position to utilise the benefits of the solutions presented by the BCSD, although some hindrances can exist for those companies. TNCs, by their nature, are very competitive companies that put time and resources into TQM, and research and development for innovation; can take full advantage of free trade globally; and see improvements in efficiency as fundamental to maintaining their competitive edge.

In 1985 the United Nations Centre on Transnational Corporations published a survey on the environmental aspects of TNCs (UNCTC, 1985). The report discusses the likelihood of TNCs having less of an impact on the environment than their local counterparts. In theory at least national regulators may be more likely to time environmental performance standards with more attention to the conditions of local companies putting TNCs at a disadvantage. TNCs have a negative influence on their environmental impact in terms of their scale. By their nature, TNCs are very large companies and the UNCTC report states that roughly 50% of all emissions of greenhouse gases are influenced by TNCs (UNCTC, 1985). TNCs have the following advantages. The TNC may represent a channel for more environmentally sound technology and may be more in touch with technological innovations abroad making it more competitive than national companies. TNCs are typically larger companies than their local rivals with a tendency to be more profitable and therefore better able to absorb the costs of environmental management activities. The technology and equipment of TNCs may be more modern and consequently more efficient compared to local enterprise. TNCs affiliates, unlike their domestic rivals, tend to be more vulnerable to demands and pressures emanating from home and host

countries with respect to social responsibilities such as shareholder resolutions and adverse press coverage.

From the findings of that report, it could be concluded that TNCs should have the best environmental performance of any type of company. However the requirements imposed on TNCs by home and host countries can also influence their environmental performance. Home country governments tend to be passive about regulating their TNCs abroad because they do not want to violate other nations' sovereignty. A more aggressive role may create intergovernmental conflicts, may lead to the home nation being charged with environmental imperialism, or put their own TNCs at a disadvantage vis-à-vis corporations home based in other nations whose governments do not enact or enforce similar legislation. National environmental control systems however are limited in terms of their power over TNCs. These corporations have a great deal of flexibility, mobility, and leverage and therefore a wide "options space". TNCs actions are not always appropriately dealt with nationally as a result of their peculiarities. However the likelihood of significant unilateral actions on the part of home countries to extend extraterritorially their environmental regulation is low given concerns of competitive dislocation and diplomatic sensitivity. Host countries are thus likely to remain the primary focus of real power over the environmental behaviour of transnational corporations into the indefinite future. The level of interest that the BCSD placed on national governmental control promotes a suggested solution ill-suited to dealing with the transboundary and global environmental problems which the UNCED conference was established to resolve.

The earlier argument on the environmental management advantages of TNCs can then be reversed and applied to small to medium sized enterprises (SMEs). Lower levels of public scrutiny, less opportunity for technological innovation, less ability to absorb costs of environmental management activities and operating with older equipment are all factors likely to lead to lower standards of environmental management. On a more positive note, the smaller scale operations are likely to contribute less to global pollution levels. However, on this last point, there is an argument to suggest despite being small scale operations, SMEs form a significant part of the economy and when viewed as a group of the business and industry sector may also make a significant contribution to global pollution. SMEs are disadvantaged by certain barriers to growth which prevent them from taking advantage of the economic climate which the BCSD sought to establish (Storey, 1994). In a survey of literature on barriers to growth, for SMEs, Storey made several points. A significant issue that emerged was the extent to which the fundamental barriers were internal to the firm, e.g. a lack of motivation, as opposed to being external to the firm, e.g. shortages of finance, government controls, lack of skilled labour. Using the BCSD argument that TQM can be extended to environmental management does not bode well for companies insufficiently motivated to develop. A further study quoted by Storey, which was based on SME management perspectives, indicates that the two most important constraints perceived by business were related to finance. The level of aggregate demand in the economy and the nature of competition in the marketplace then follow this in importance. Next in significance were matters relating to managerial skills and skilled labour availability.

This suggests an overemphasis on management to solve environmental issues in SMEs may not address the real constraints to action.

2.6 Conclusions

Business and industry is motivated and driven by competitiveness. Although competitiveness is not clearly defined and many interpretations and models of competitiveness exist, there are three key features that are consistently used to describe competitiveness. Competitiveness is about trade, productivity and innovation. These three features are inextricably linked: increasing trade, such as occurs through globalisation, will increase both productivity and innovation. Similarly increasing productivity will increase trade and innovation and finally increasing innovation will increase trade and productivity.

Globalisation has made the need to gain competitive advantage through increasing the sophistication of goods more intense. Competitive advantage is no longer factor based and therefore no longer achievable solely through skilled labour, land with desirable infrastructure, plentiful and accessible natural resources and capital to finance investments. To produce increasingly sophisticated goods requires innovation. Innovation is consequently becoming more market driven than knowledge driven. Maintaining a competitive edge, in this increasingly sophisticated market place, is about increasing consumption of new and more diversified products. This creates a continual release of new and improved products and is characterised by a positive feedback loop driven by demand.

The chapter explored industrial ecology and ecological modernisation; two fields of sustainable development that seek to reconcile its aspirations with industrial strategy and activity. Comparing the two has led to the conclusion that ecological modernisation is a theory that fully encompasses industrial ecology, but that takes a more strategic approach to sustainable development, incorporating ideas about policy influence and decision-making.

Comparing the more strategic theory of ecological modernisation with the aspirational framework of sustainable development in the context of industrial competitiveness leads to further conclusions that ecological modernisation does not address social issues of skills and labour for a more sustainable future, equity of natural resource distribution and the impact of dematerialisation on developing countries. Ecological modernisation is significantly limited by its geographic application and, although still under development, has so far failed to into consideration the effects of global trade patterns in regard to pollution, labour and natural resource use. There are other features of ecological modernisation that are still being developed and advocates of the theory describe these gaps as part of the process of the theory's development. Such areas largely relate to the various possible impacts of innovation on consumption and demand for new goods in relation to natural resource conservation and management, wealth distribution and capacity to increase consumerism. The theory also needs further development to take into account the impact of trade on resource conservation and management.

In many ways sustainable development has the same potential for reconciliation with competitiveness as ecological modernisation does, and with similar shortcomings. The main area of difference is in relation to social needs that sustainable development has addressed more holistically than ecological modernisation. Particularly this relates to issues of equity in relation to global trade, resource use and labour patterns.

There are elements of sustainable development and competitiveness that can be reconciled but a complete reconciliation of the concepts is not possible. For example reconciliation occurs through efforts in education and resource efficiency as well as the wealth created by competitive companies and nations and the positive effect on the economic aspects of sustainable development that that creates. However there are elements of each concept that will be difficult to reconcile. In particular, the conservation of natural resources, the inequity of resource depletion and of distribution of wealth, the role of innovation in creating increasing consumer demand are all areas where natural reconciliation of the two concepts will not occur.

Business-led innovation can be sustainable but the focus of effort will determine whether or not this is so. The role of innovation in increasing consumption levels has already been mentioned. Innovation can have a role in increasing efficiency of resource use, supporting implementation of new systems and procedures that encourage more sustainable working practices and create new products that make more sustainable lifestyles possible. However as innovation becomes increasingly demand led, the creation of demand for more sustainable lifestyles and products will

be required to motivate innovation to take this role in practice. This then becomes an issue about personal values, cost, accessibility and image of more sustainable lifestyles. Whether or not innovation is inherently sustainable or unsustainable is therefore dependent on consumer demand and the relative impacts of efficiency measures over increased consumption in the context of sustainable development.

Even the apparently simple reconciliation of efficiency and education has difficulties when the global view incorporating a role for free trade is considered. The theory of comparative advantage suggests that countries will specialise in the production of goods and services in which they are most efficient by maximising their output from a given level of resource input and therefore move towards conserving resources (LeQuesne and Clarke, 1997). This aspect of open, competitive international trade which the Business Council for Sustainable Development (BCSD) states is essential for the efficient distribution of environmentally sound technologies and which is driven by efficiency should according to advocates of free trade increase economic growth sufficiently to generate funds needed to invest in environmental protection. The theory of comparative advantage assumes that the factors of production are not internationally mobile so that each country's capital and labour remains exclusively within its own borders. However in today's global economy the increasing mobility of capital makes it possible to follow the logic of absolute advantage and for companies to seek out the location with the lowest production costs. This leads to pressure on those countries without such advantages to reduce labour and environmental standards as well as investment regulations to increase their own

competitiveness. Thus it is possible that the pursuit of certain types of efficiency might not result in the end goal of sustainable development.

The features of competitiveness and sustainable development that can be reconciled could be described as sustainable competitiveness. At a conceptual level therefore sustainable competitiveness is a term describing any facet of business competitiveness that positively contributes to sustainable development. Sustainable competitiveness has a number of features such as an eco-efficient product lifecycle, new product and market creation for more sustainable lifestyles, social responsibility including development of skills for an advanced competitive employment market, allocation of financial resources to address social welfare and consideration of the global balance of resource use as well as responsible business leadership. With a business preference for voluntary agreements sustainable competitiveness would also require increased accountability of business and focussed engagement with stakeholders to identify consumer demand. It is important to be very clear that sustainable competitiveness does not cover all aspects of sustainable development and competitiveness and there are still issues that need to be resolved outwith sustainable competitiveness before sustainable development and competitiveness can be reconciled, even conceptually. In particular this relates to issues about:

- the role of innovation in increasing consumption,
- the distribution of wealth generated by companies and nations in pursuit of competitive advantage,
- the allocation and agreement of responsibility for social and environmental protection and

- the development or identification of the best tools and management structures to ensure that this happens.

In essence the concept of sustainable competitiveness identifies responsibilities of business and of government and rationalises how the responsibilities should be dealt with according the issues concerned. Thus issues that require to be managed for a sustainable outcome should have policy measures that are developed in consensus with business and industry and where some voluntary aspect of responsible business behaviour can be encouraged by the right policy tools. Other issues that are externalities to sustainable competitiveness require to be given different consideration by government and perhaps are less the realm of voluntary agreements ad more the realm of regulation. Such policy approaches are discussed in the context of Agenda 21 in Chapter Three and explored more fully in relation to this emerging concept of sustainable competitiveness in later chapters.

Sustainable competitiveness demonstrates where management or intervention by government is required to reconcile sustainable development and competitiveness. This is difference from ecological modernisation, which is open ended and has not set such limitations to its scope. Therefore the concept of sustainable competitiveness seeks to point to areas of policy where particular approaches need to be taken and this being more prescriptive that ecological modernisation theory.

The range of social issues facing industry varies according to the sector of their work but there are certain common threads that can be associated with any business. Three

of these are health and safety, human rights and education and training. As stated above the BCSD made little mention about the social responsibilities of business and industry in its report for UNCED.

BCSD perceived the debate and global interest in sustainable development as a threat to competitiveness and promoted business led views on sustainable development in an effort to mitigate this perceived threat. BCSD anticipated that any global agreements on ways to implement sustainable development would result in increased regulation and hinder free trade and so set out to argue against this course of action. The BCSD promoted innovation, pollution prevention, Total Quality Management (TQM), efficiency, free trade and flexible agreements for sustainable development. Innovation was promoted as a means to encourage pollution prevention. This was interpreted very much as increased efficiency, good housekeeping, materials substitution and resource recovery.

The BCSD promoted business activities that facilitated more efficient business operations at minimum disruption to business as usual. The heavy promotion of voluntary and flexible agreements by the BCSD argued against regulations. The strongly environmental perspective taken by BCSD meant that some of the sustainable social and economic benefits of competitive activity were overlooked, in particular education and employment opportunities. This suggested that the BCSD was taking a confrontational stance against the threat of environmental regulation, that they failed to promote the features of business activity that support sustainable

development and indicates that there was a lack of understanding of sustainable development.

The approach that the BCSD took towards trade put the responsibility for internalising environmental costs firmly with nation states whilst simultaneously arguing that only by gaining national competitive advantage (by export led trade) will countries ensure development. The two suggestions appear to be contradictory with the emphasis on trade placing a need for production costs to be competitive and therefore not hampered by the additional cost of internalising environmental protection through regulations or market mechanisms. Thus the BCSD report relies on national governments to set values on environmental resources while promoting an increasingly global economy in which governments' interest in setting regulations and assigning high value to environmental resources appears to be decreasing because this is viewed as anti competitive. In also promoting innovation, the BCSD were subtly promoting increases in consumption while arguing that innovation would create greater efficiency. Basically the BCSD argued for nothing other than the status quo.

The BCSD represents the interest of Trans National Companies (TNCs), which are typically large multinational and highly competitive companies. However the voluntary agreements with an emphasis on TQM, the role of innovation, the drive for efficiency and trade are not necessarily attractive to smaller businesses, which have a substantial environmental impact. Therefore the smaller businesses are less likely to enter into such voluntary agreements and will not have the environmental benefits as

identified by the BCSD. The BCSD has presented solutions to sustainable development that only the large and most competitive companies will be able to develop.

While business and industry is a powerful influence on policy and lifestyles, it is not responsible for preparation of global or national policy and as such the views of business and industry must be considered in the context of other pressures on government in setting policy. Having gained a conceptual understanding of the potential reconciliation of sustainable development and competitiveness and the views of the business and industry sector, it is now important to give consideration to the role of policy in leading implementation on sustainable development. Policy on sustainable development was first set at a global level at UNCED with consideration of both the conceptual nature of sustainable development and the pressures of remaining competitive having a major impact on the final policy document, Agenda 21. The next chapter describes how Agenda 21 was prepared and its content.

CHAPTER THREE: AGENDA 21

3.1 Introduction

The problems that sustainable development tries to address are characterised by being global, interconnecting social, environmental and economic problems and are problems which are not being resolved by the existing management of global systems. Sustainable development grew out of concern over environmental stresses and conceptually reflects the fact that such stresses are often only fully recognised as problems a long time after they are created. As discussed in Chapter One, the nature of sustainable development requires a long-term and global perspective. Its complexity and relationship with economics and social considerations means that it can only be achieved by setting priorities rather than by a dedicated and widescale implementation. This requires a local and national view to be considered in addition to global and long-term pressures.

The strong global economic emphasis on competitiveness as the major goal for countries and companies will meet some of the needs of sustainable development but it fails to give proper consideration to some of the most challenging aspects of sustainable development as noted in Chapter Two. In particular, competitiveness fails to address key issues of over consumption, equity and the potential depletion of natural resources. These, together with the areas of competitiveness identified in Chapter Two (trade, productivity and innovation) that may or may not be competitive and sustainable

depending on the circumstances, are features of international and national decision-making that require to be addressed.

The potential to develop agreements, targets or management systems that address the areas where reconciliation between sustainable development and competitiveness needs to be established. There was an opportunity for this in the development of Agenda 21. Setting priorities for action and seeking solutions to implement sustainable development is what Agenda 21 sought to do. This chapter is about the development and the contents of Agenda 21, the extent to which it sets priorities for sustainable development and establishes leadership on means to implement that goal.

Agenda 21 is analysed in the context of sustainable development and competitiveness and ultimately its feasibility in addressing the issues is assessed. The second section describes Agenda 21 and its development. As a global policy tool Agenda 21 has the potential to identify new tools and mechanisms to facilitate the implementation of sustainable development. The priorities of Agenda 21 and the proposed means of implementation are analysed in the third and fourth sections of this chapter. A fifth section analyses the political, financial and technical feasibility of the policies agreed by Agenda 21 in meeting the objectives of Agenda 21 and sustainable development. Finally the chapter is concluded.

3.2 Agenda 21: Description and Development

3.2.1 Description

Agenda 21 was one of five global agreements made at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro during June 1992. The other agreements made were the Rio Declaration, a list of principles for sustainable development; the Climate Change Convention, agreeing action regarding global warming; the Statement on Forest Principles; and the Biodiversity Convention[16]. The conference was host to over 100 world leaders, 500 non-governmental groups, 8,000 accredited journalists and 30,000 citizens (Jordan, 1994). Agenda 21 was the longest and most wide ranging of any of the agreements.

Agenda 21 is a non-binding policy document that sets out policy goals for each of its signatories (110 governments) in regard to the achievement of global sustainable development and was prepared in response to the increasing awareness of environmental degradation on a global scale. The report was prepared in a climate where a widespread feeling of inadequacy and frustration existed amongst the international community about the ability to address global issues. This occurred at a time when understanding of the intricate links between seemingly local environmental problems and their global effects whether on climate or commodity markets was becoming gradually accepted as fact (Sitarz, 1994). In addition the increasing gaps between standards of living in developed

and developing countries were also becoming a significant cause for concern amongst the international community. The document itself is a five hundred page text in language that is subtle and often obscure. Such language is probably necessary in a policy document that sets out to achieve so much and be agreed by so many. The agreement states actions that are guiding principles and recommends a means of achieving those principles. However, none of the actions recommended are statutory requirements for each signatory nor are the actions outlined necessarily the ones which will result in sustainable development in the long term.

The document itself is divided into four sections. Firstly the social and economic dimensions are set out discussing issues such as poverty, consumption, population, human health, settlements, international co-operation and the integration of environment and development in decision-making. The second section of Agenda 21 discusses the conservation and management of resources for development. It covers issues such as protection of the atmosphere, land management, deforestation, desertification and drought, sustainable mountain development, agriculture and rural development, biological diversity, biotechnology, protection of the oceans, freshwater resources, toxic chemicals, hazardous wastes, solid wastes and radioactive wastes. In the third section the major groups are discussed. These major groups are the social groups that are seen as having a major role in the effective implementation of Agenda 21. The chapters

---

[16] For more information see UNED, 1992

relating to the major groups describe how the necessary level of social participation of each of those groups could be achieved. The groups are women, children and youth, indigenous people, non-governmental organisations, local authorities, workers and trade unions, business and industry, scientific and technological communities and farmers. The final section of Agenda 21 describes the means of implementation of Agenda 21: how it will be funded, how technology will be transferred; new countries will co-operate; how science has a role in sustainable development; the role of education; public awareness and training in sustainable development; what national mechanisms and international co-operation, international institutional arrangements, international legal instruments and mechanisms are needed and information required for decision making (UNED, 1992).

3.2.2 Six Themes of Sustainable Development

The Brundtland Report was responsible for promoting the first commonly understood definition of sustainable development although it did not cover what sustainable development would mean in practice. As a main driver in the political negotiations for UNCED it is important to understand the principles on which the Brundtland report is based. The Brundtland report identifies six challenges common to the world community. These are population and human resources, food security, species and ecosystems, energy, industry and the urban challenge (WCED, 1987). The approach that the document takes on each issue reflects fundamental views that are the core to the Brundtland report and to the foundation of Agenda 21.

In regard to industry the Brundtland report states that:

> "*Industry is the key to the economies of modern societies and an indispensable motor of growth*" (WCED, 1987, pp206)

The report recognises that industry does have negative environmental effects. It describes local problems such as air, land and water pollution and goes further discussing the possible material resource constraints, noting that although these are non-renewable resources they are unlikely to run out in the near future. However industrial development is viewed as a prerequisite to development in the report. The implications of this activity are a secondary consideration once the actual industrial development has taken place.

> *"World industrial output would have to be increased by a factor of 2.6 if consumption of manufactured goods in developing countries were to be raised to current industrial levels. Given expected population growth, a five to ten fold increase in world industrialisation output can be anticipated by the time the world population stabilises sometime in the next century. Such growth has serious implications for the future of the world's ecosystems and its natural resource base*" (WCED, 1987, pp213)

The solutions to environmental problems brought by industrial development are proposed as increased efficiency and some examples are given of areas where increased efficiency has already reduced raw material consumption for a given process through the use of technological development. There is however no mention in the report of the negative social or cultural impacts of industrial development.

The main question for the Brundtland Commission, therefore, is how to sustain industrial development without cutting into the resources upon which future growth

depends (Chatterjee and Finger, 1994). This is how the definition of sustainable development was developed. The report proposes that the world including the developing countries needs economic growth to slow the rate of population growth, and to support the future population with the living standards of the western world. All this must be achieved without running out of basic resources and the solution to this is a move towards a lessening dependence on the natural environment through technological development. A level of 3% for global economic growth is viewed as necessary as a minimum for reasonable development (WCED, 1987).

In 1987 when the Brundtland Commission published the report "Our Common Future", a similar commission was established amongst Southern countries. The findings of the South Commission report concluded that economic growth involving industrial development was the main concern of the governments involved. The South Commission sets out four priorities each based on the responsibilities of national governments: agricultural development and food security; industrialisation; service industries; and trade strategies. The report concludes that international trade is the main tool for progress together with fast and strong national economic growth. The means that are suggested for achieving these goals view the industrialisation and improvement of the efficiency of agriculture as essential. Also essential are the education and training of the population in science and engineering skills in order to close the gap between the North and the South in terms of technological advance.

The South Commission takes the same view as the Brundtland Commission in treating the environment as an economic resource. Both reports agreed that the rational exploitation of the environment as a resource is required but the South Commission, contrary to Brundtland, is quite clear that any resulting pollution of the natural environment is acceptable in the pursuit of economic growth (Jordan, 1994).

"*This [industrialisation and pollution] is just, as well as necessary, given the enormous disparity in the levels of energy consumption between the North and the South, and the indisputable right of the South to develop rapidly to improve the well being of its people*" (The South Commission, 1990, pp141).

This point is emphasised by the South Commission's view that the south is in competition with the North for what it sees as limited environmental resources.

Southern governments agreed with the North that resource constraints could be overcome by the development of new and better technology and therefore did not really see the need to take resource constraints very seriously. Malaysia is one example of a country where it is accepted that biomass resources will run out but it is forecast that economic growth will be far enough advanced that when this happens the country will be economically strong enough to import the necessary biomass. This is similar to the current activities in many Northern countries. If all countries were to plan using this development model there would be a shortage of biomass very quickly. To develop this model further the long-term stability of this model is secured by technological advances which move away from a biomass based economy to an industrial technological based economy (Banuri, 1994).

There are six themes in Agenda 21. A critique of each is given in the subsections following. The six themes are:

- Quality of Life
- Use of Natural Resources
- Sustainable Economic Growth
- Global Commons
- Management of Human Settlements
- Chemicals and Waste Management

3.2.2.1 Quality of Life

The quality of life on earth is a lofty aspiration involving the eradication of poverty, raising the level of health, full employment, and control of population growth. Each of these issues are core principles of the United Nations and therefore it is not surprising that they found their way into a UN led conference negotiation. Agenda 21 sets out to tackle these issues through industrial development and thereby economic growth. Agenda 21 never explicitly identifies industrial growth or economic development as a problem for the biosphere. When the problems that relate to resource consumption are discussed, Agenda 21 puts the level of responsibility with the individual. The document identifies current resource consumption patterns as the problem leaving the solutions open to changes in individual behaviour.

3.2.2.2 Natural Resource Use

The efficient use but not the conservation of the earth's natural resources is one of the single most important issues in Agenda 21. This is identified in part by the frequency with which it is referred to and the variety of solutions efficiency is suggested to resolve. This emphasis on efficiency transforms everything into a resource and attaches an economic value to it. For some of the observers at UNCED the carrying capacity of the Earth must be valued as an economic resource if it is to be assured of protection (Sitarz, 1994). Such a valuation system has been criticised for not appreciating the full value of resources to humans or as living beings in their own right.

3.2.2.3 Sustainable Economic Growth

A third theme of Agenda 21 is sustainable economic growth. Agenda 21 tries to integrate environmental protection into economic growth and does not in any way compromise emphasis on free trade or economic growth through consideration for environmental protection. It seems to be accepted wisdom that market mechanisms are best suited for environmental protection allowing the free market perspective to be perpetuated. Agenda 21 leaves the World Trade Organisation (WTO, formerly known as the General Agreement on Trade and Tariffs (GATT)) with no obligations on environmental issues altogether (Treece, 1992).

3.2.1.4 Global Commons

The use of market mechanisms does not apply easily to the protection of the global commons. By their nature such resources are not located within national boundaries and

so it is problematic to apply economic rationality to them. In such cases Agenda 21 falls back on regional and global agreements to regulate the exploitation of global commons but as many of the solutions as possible are set in national areas in order to maximise application of economic rationality.

3.2.2.5 Management of Human Settlements

The management of human settlements is another major issue for Agenda 21. The solutions here are to continue building and developing but in increasingly energy and resource efficient ways. Hence the need for training and skills development to allow this process to take place. The emphasis on training in a technical sense continues the theme that the problems Agenda 21 was established to address can be solved through application of technical solutions.

> "*By framing environmental problems in terms of solutions which can only be provided by the input of capital, technology, managerial expertise and economic policies under the control of the imperialist powers, the GEF will effectively tighten its grip on those aspects of the environment - the seas, forests, the atmosphere and biodiversity - that are essential to the profitability of the global capitalist economy*" (Treece, 1992)

This point suggests that competitiveness as it relates to profit was a key beneficiary of the Earth Summit. Internalising environmental costs by attributing a monetary value to them:

> "*Commercialises and legitimises the right of capital to degrade the environment, while passing on the real costs to the consumer*" (Treece, 1992).

3.2.1.6 Chemicals and Waste Management

Finally Agenda 21 seeks to address the use of chemicals and the management of waste. Waste is acknowledged as a problem, avoiding discussion on the factors that cause waste

to arise. Chemicals in Agenda 21 are not viewed as a problem but are just "misused". When the relative human health and environmental damage risks of the two issues are compared it would appear that Agenda 21 has failed to fully recognise the dangers associated with chemicals "misuse".

In summary the common themes that come through all the priorities of Agenda 21 reflect the priorities set by the WCED in its report. These priorities are that economic growth is a cornerstone to sustainable development and that trade to achieve economic growth is a high priority and indeed essential. It is emphasised that environmental issues should not be dealt with in a manner, which has a negative impact on trade and therefore productivity and competitiveness. Competitiveness is perceived as the priority for economic growth and viewed as essential for sustainable development by Agenda 21 (UNED, 1992). Agenda 21 puts a strong emphasis on personal responsibility, which detracts from the role of the nation state to some extent and devolves responsibility to the individual. There is also an emphasis on training rather than learning which contradicts the role of personal responsibility. Furthermore priority is given to seeking technological solutions that improve processes and increase efficiency leading to the conclusion that Agenda 21 is very much about technical fixes and this again undermines the potential for personal responsibility. There are obvious gaps in the approach of Agenda 21 in terms of: creating a sense of community empowerment; equity; reducing consumption; conservation of resources; and global commons management. These are

the very issues that conceptually cannot be reconciled with competitiveness as concluded at end of Chapter Two.

3.2.3 Priorities for Business

The chapter that Agenda 21 dedicates to strengthening the role of business and industry describes the role possible in sustainable development. Referring to existing good practice the chapter proposes two programmes that are aimed at improving production systems and stimulating more varied, effective and efficient systems. The first programme is entitled "promoting cleaner production". The objective of this programme is to increase the efficiency of resource utilisation, including increasing reuse and recycling of residues and reducing the output of waste arising from production processes. The second programme promoted by Agenda 21 is entitled "promoting responsible entrepreneurship". In this programme the objective is to encourage the concept of stewardship in the management and utilisation of natural resources by entrepreneurs and to increase the number of entrepreneurs engaged in enterprises that subscribe to and implement sustainable development policies. There is a strong emphasis on both voluntary agreements by business, especially large corporations, and on the role of national governments in making these programmes possible. Additional costs to implement these programmes are not expected to be significant (UNED, 1992).

In these sections Agenda 21 very clearly puts the stated priority of efficiency and innovation to find technical solutions into the remit of the business and industry sector.

Agenda 21 fails to impose any responsibility for environmental or social needs onto the business or industrial community.

3.3 Achieving the Goals

There are very many ways in which the objectives stated in Agenda 21 could be achieved but the main and most practical ways are through setting targets and standards and by imposing responsibilities on its signatories and organisations under their direct influence. This section assesses the various solutions promoted by Agenda 21 examining first its role in setting targets and standards, then its specific allocation of government responsibilities especially through economic instruments, regulations and voluntary agreements. Finally the section describes the role of Local Agenda 21 set out in Agenda 21 as the allocation of responsibilities to a more local level of governance and the local level at which most sustainable development activities are appropriately implemented.

3.3.1 Targets and Standards

Agenda 21 does not set actual targets or standards with which all countries must comply. The document also recognises that

"Environmental standards valid for developed countries may have unwarranted social and economic costs in developing countries" (UNED, 1992).

This point is reiterated throughout the document emphasising its importance. The approach is rather to establish areas where individual countries should set standards. Not all standards will require to be set by individual countries because reference is made to already established international standards. In these circumstances where

internationally agreed standards have already been established, for example in regard to atmospheric pollution, countries are encouraged to achieve higher standards if they wish. Agenda 21 seeks to establish a balance between practical standard setting and over zealous and unnecessarily stringent standards.

In general standard setting is mentioned in the context of human health, particularly with regard to children, disaster prone areas, construction industry activities, atmospheric pollution, protection of freshwater, hazardous chemicals, management of hazardous wastes, equal opportunities regarding employment of women and the role of workers and trade unions. It is not explicitly expressed that health and safety standards for all workers should be improved in certain countries although this certainly seems to be a theme running through the recommended actions that relate to all workers. Standard setting is not mentioned in regard to industrial pollution or resource use. There are no standards recommended for business and industry in Agenda 21.

In practice no new standards or easily measurable targets were set in Agenda 21. Certain delegates at the conference actively disregarded some potentially critical targets such as reductions in greenhouse gas emissions. The impact of the document was significantly weakened because no measurable targets and standards were set allowing interpretation to be applied where countries wished. The non-binding nature of the agreement was also a significant factor in weakening the impact of the document.

3.3.2 Government Responsibilities

Agenda 21 was a document written for governments and signed by governments. As such the document recommends certain measures which governments can undertake to achieve the broad priorities outlined in 3.3 above. The principle mechanisms which governments are encouraged to use are an appropriate mix of economic instruments and normative measures such as laws, regulations and standard setting. Partnership working between governments and industry is mentioned in the text but is not given a significant role in the proposed solutions except for the business and industry sector. Each of the measures is suggested as a non-specific tool to be applied at a national level.

3.3.2.1 Economic Instruments

Economic instruments and market mechanisms are recommended for use in

> *"Issues related to energy, transportation, agriculture, forestry, water, waste, health, tourism and tertiary services, global and transboundary issues, the development and introduction of environmentally sound technology and its adaptation, diffusion and transfer to developing countries"* (UNED, 1992).

The use of economic instruments and market mechanisms is specifically mentioned in the chapters relating to the protection of freshwater, the management of hazardous wastes, and the good management of solid waste. The polluter pays principle is also mentioned in these chapters and it is expected from this that industry and the consumer will therefore be responsible for polluting activities. However the section on the role of business and industry fails to explicitly mention prevention instead emphasising the goal of efficiency in waste management. Although economic instruments are referred to at the above points in the text in relation to energy and transportation, when the same

issues are discussed in the chapter on air pollution no mention is made of the use of economic instruments. This is despite the USA having implemented a permit-trading scheme designed to reduce air pollution and raise revenue.

The use of economic instruments strengthens the view that Agenda 21 and its signatories are prepared to attach an economic value to all resources and to manage these resources on a national basis. Economic instruments are suited to application within national boundaries and are difficult to apply on a larger scale. There is in addition evidence to support the view that economic instruments are less of a financial burden than regulations and that they encourage innovation rather than prescribing the solution to a given problem. All this supports the principles of free trade and market competitiveness, which underlie many of the actions proposed in Agenda 21.

3.3.2.2 Laws, Regulations and Standard Setting

There are two possible applications of legislation noted in Agenda 21: domestic laws and regulations and international legislation. International laws already exist for some global polluting activities such as ozone layer depletion and there is a vast array of legislation governing ocean management. It is seen as vital in Agenda 21 to have further development of international law on sustainable development that gives special attention to the delicate balance between environmental and developmental concerns. In addition an objective to gradually develop international standards for the protection of the environment that take into account the different situations and capabilities of countries is seen as desirable. Such legislation will be made with a high level of participation from

all affected countries. In addition to these measures however countries are expected to put in place sufficient domestic legal mechanisms to encourage the activities outlined in Agenda 21. There is no reference to what such regulations might be but it is noted that they should function to promote cleaner production, efficient resource use and reduction of waste. It should be noted that there is no link between the role of regulations in cleaner production in Agenda 21 and the role of business and industry, where a strong emphasis is placed on voluntary agreements. The only chapter which specifically mentions governments establishing regulations for the management of hazardous wastes is where Governments are asked to establish regulations that lay down the ultimate responsibility of industries for environmentally sound disposal of the hazardous wastes their activities generate.

3.3.2.3 Partnerships

Partnerships are mentioned in more parts of the text than either legislation or economic and market instruments. However the discussion regarding partnerships emphasises partnership as a means of communication to agree on mechanisms to implement policy. They are not expressed in the nature of voluntary agreements that can substitute for market mechanisms or regulations. For policy planning and management the following applies

> *"The responsibility for bringing changes lies with governments in partnership with the private sector and local authorities and in collaboration with national, regional and international organisations. Partnership working largely relates to the necessary exchange of information and in capturing the expertise of different groups such as business and industry in the areas which affect the environment"* (UNED, 1992).

The above applies except in the business and industry chapter of Agenda 21 where voluntary agreements are given specific mention as noted earlier.

3.3.3 Local Agenda 21

Local Agenda 21 is viewed as a central mechanism for the implementation of Agenda 21. It has been estimated that roughly 80% of the problems that Agenda 21 attempts to resolve have their roots in local problems and therefore require to be dealt with in some way at a local level. Local authorities operate the social and environmental infrastructure overseeing planning applications, regulating environmental policies and have a central role in the health and economic development of their local communities (Sitarz, 1992). Local authorities are also the first interface which many citizens have with government agencies and have close links with needs and requirements of local populations.

The development of a Local Agenda 21 is quite different from the development of Agenda 21. Local Agenda 21 plans are intended to assess the sustainable development priorities in a given area through dialogue with the local communities. This begins to alter the very manner in which local governance is applied. Each local authority is asked to enter into a dialogue with its citizens to understand their concerns as they relate to the aims and objectives of Agenda 21 and to educate and raise awareness of the issues to which Agenda 21 seeks to respond (Sitarz, 1994). The primary success of the Local Agenda 21 movement to date has been to build the prerequisite local institutional

capacity for sustainable development in hundreds of communities and dozens of countries. However the vague nature of Local Agenda 21 means that different countries and different local areas within those countries have each applied the basic principles very differently. Few existing Local Agenda 21 strategies are linked to national level strategies and consequently there is a lack of support for local authorities in their efforts (Dodds, 1997).

Local authorities that do develop plans, such as Hamilton-Wentworth in Canada's Vision 2020, have difficulty in measuring the performance of implementation of the plans. While new proposed actions are developed accounting for the principles in Vision 2020, existing structure plans and capital budgeting of the municipality are not necessarily consistent with the objectives of Vision 2020. Local authorities are often tightly constrained to undertake enforcement actions or statutory duties under the guidance of national governments that do not comply with the objectives of a Local Agenda 21 strategy. A further example of this is set in the UK where local planning authorities are prevented from incorporating sustainable development policies in local plans by national government. This is on the basis that in certain cases such policies contravene "presumption in favour of development". This is despite government guidance on the subject requiring local authorities to incorporate policies for sustainable development in local plan documents (Agyeman and Evans, 1994).

A further problem is that by their very nature, Local Agenda 21 action plans and strategies must tackle local priorities therefore creating uncertainty in meeting the global objectives of Agenda 21. However Local Agenda 21 does educate local citizens about the links between local and global problems (Dodds, 1997). The local approach to Agenda 21 is in part reflective of the view of Agenda 21 that individuals are responsible for the quantities they consume and that through encouraging greater understanding of the issues individuals may be encouraged to take more responsibility for their actions (Agyeman and Evans, 1994).

The principle of subsidiarity, i.e. devolving the decisions to the most appropriate level, is one of the foundations of Agenda 21. By framing so many of the issues of Agenda 21 in terms of economics and economic development, Agenda 21 has forced a situation where many of the decisions will be taken at a national level whether or not this is the most appropriate level. The critical appraisal of Agenda 21 preceding this section suggests that Local Agenda 21 is all but redundant. Local Agenda 21 is in practical terms more about democratisation and balanced partnerships with local agencies and integrated and holistic policy making than any of the specific issues raised in Agenda 21 (Whittaker, 1995).

3.4 Feasibility of Success

The success of Agenda 21 is dependent on a number of factors. It requires co-operation on an unprecedented scale. It also requires a high level of trade and competition to

maintain the drive for innovation and economic success. Agenda 21 is a highly ambitious document seeking to resolve problems that on a global scale seem to conflict in so many ways. However the success of Agenda 21 is reliant on three principle factors. Firstly whether sufficient funding can be made available to fulfil the commitments made by each country. Secondly, there must be political will present in each country. As different domestic challenges arise for each government, the principles of sustainable development must remain at the front of the minds of politicians. In addition however the methods politicians use to implement the principles sought in Agenda 21 will determine how successful the document is in achieving its goals. Thirdly there are a number of technical requirements of Agenda 21. Agenda 21 stresses innovation and technofixing as a means to reduce dependency on natural resources and demonstrates the will to transfer new technologies to developing countries in order to assist those countries in the development of efficient production and in minimising wastes and by-products of that production. The theory of ecological modernisation discussed in Chapter Two has evolved in an effort to address some of these issues. The theory regarding the role of government in the process of ecological modernisation developed during the early 90s' and possibly was developed to reflect the needs of Agenda 21 (Murphy, 2001). Each of these issues will be discussed separately below.

3.4.1 Financial Support

The financial success of Agenda 21 will be measured according to which of two perspectives are taken. Firstly because developing countries have specific financial

limitations and because sustainable development imposes additional financial burdens at least in the short and medium term, there is a necessity to provide donor assistance to developing countries to help cover additional costs. This can be judged from the amounts of donor assistance and forecasts of the same. The second view is that all nations are far from sustainable development and consequently face the same tasks of rearranging financial and economic mechanisms as part of the process towards sustainable development. The issue of being able to lever significantly larger private investments for sustainable development could be achieved through government investment in the improved regulatory and enforcement systems and provision of adequate information and investment vehicles to overcome investor reluctance. Priorities for sustainable development that are not apparent in the current treatment of donor assistance of this nature could be extremely beneficial to sustainable development progress all over the world (Bramble, 1997). There is a need to use regulations and market mechanisms to lever private sector funding and potentially also a need to generate more wealth to support sustainable development.

Since the agreement of Agenda 21 and in view of the increasing private finance available to developing countries the US Export Import Bank, the World Bank's Multilateral Investment Guarantee Agency and International Finance Corporation have announced new policies and procedures to integrate social and environmental concerns into their financing decisions. These agencies co-fund the private funding available to developing countries but they are dependent on customers coming to them. Officials claim to have

little opportunity of promoting businesses that would further sustainability such as those that feature high employment, low resource use, energy efficiency, clean industrial process technology or non-timber forest products. For many low-income countries debt and structural adjustment still remains a significant problem with the total debt of all developing countries rising by 8% in 1995. (Bramble, 1997)

One major factor that promotes socially and environmentally damaging projects in Third World governments is the burden of debt to financial creditors.

> *"A fractional reduction in the 1.3 trillion US dollars owed by the developing countries would be sufficient to pay for the 100 or so billion US dollars needed annually to clean up the world's environment" (Treece, 1992).*

The debt in itself does not lead to environmental destruction in many cases although it does force countries to use more cash exports lowering their food security and long-term sustainability. The debt indirectly affects the environment because it results from large-scale structural projects such as dams and nuclear power plants that do cause environmental problems. What these projects highlight is the role that such grants and loans play in integrating previously marginal economies into the global market (Treece, 1992).

The leverage from private investments for sustainable development demonstrates a more innovative and flexible approach than donor assistance does. Private investments for sustainable development can be made in a number of ways such as through raising venture capital, private investment, companies operating specific programmes of work or

through revenue raising from market mechanisms, for example. Such investments will result from strong government leadership on sustainable development and will be explored further in the data collection chapters.

3.4.2 Technical Innovation

This area is probably likely to be a success given the amount of effort and investment that has been put into it. Business and industry were a strong lobby at UNCED (as was discussed in the previous chapter) and a major pillar of the argument presented by business and industry as the solution to sustainable development. As part of this solution it was proposed that increasing resource productivity and the efficiency of resource use was a possible solution. New publications such as "Factor Four" (Von Weizacker et al, 1997) express the possibilities of increasing the efficiency of production processes. Publications such as this which offer technological solutions and development in line with efficient use of resources are heavily supported by business and industry. The idea supports economic growth, promotes competitiveness and permits business as usual; all core elements of Agenda 21. For this reason the technological feasibility of Agenda 21 is sound. However, the role of innovation in increasing consumption, as concluded in Chapter Two, means that although technological feasibility may be successful in meeting the requirements of Agenda 21, it may fail to meet the needs of sustainable development.

An equation known as the sustainability equation provides a simple model of the relationship between environmental impact and human activity. The equation is:

$$I = PxCxT,$$

where I = environmental impact, P = population, C = consumption per person and T= environmental impact per unit of consumption: i.e. a measure of how efficiently the economy uses natural resources and produces wastes[12]. Using this equation it is possible to gain a simple insight into the necessary reduction in resource use or waste production or increase in efficiency of resource use at projected levels of increased population and consumption with no change in environmental impact.

If, as is possible, the world economy grows by 2% to 3% per annum it would imply a fourfold increase in consumption over a period of fifty years (Jacobs, 1997). If over the same fifty year period the world's population doubled then for the global environmental impact to remain at the same level of pollution as at the current time, there would have to be an eightfold increase in the efficiency of resource use and waste production. If global environmental impact remains at the same level a build up of pollutants and an increase in factors contributing to environmental damage will result as the earth has not been given an opportunity to repair itself over that period. No change in the overall condition of the environment over that fifty-year period would mean that the earth is recovering from environmental damage at the same rate as it is occurring. Scientific

---

[12] Sources: Ekins and Jacobs (1995) and Harrison (1993)

study on the ozone layer, for example, demonstrates that for some pollutants and environmental stresses this is not the case. It is important to note that the increase in environmental impact per unit of consumption is not just a reference to improvement in technology but to changes in economic life and life changes by moving to less resource intensive consumption patterns.

The Club of Rome has similar statistics to demonstrate the urgency of the global impact of current levels of economic activity. A medium estimate by the United Nations projects suggests that total world population will nearly double to over 10 thousand million people by 2050 (Von Weizacker et al, 1997). The same source estimates that a per capita consumption increase of 1.5% per year at this level of population increase would lead to a quadrupling of consumption over that period. The example quoted is in reference to the proposal that improvements to technology could result in a factor of four in the efficiency of resource use. It is not clear at this stage what impact the proposed efficiency revolution would have on the level of consumption of resources.

However technical innovation for the purposes of sustainable development needs to be understood in the political context. If technical innovation is to support progress towards sustainable development it needs to be led and guided by political leadership and it needs to be financed. If this is not the case then the innovations created by business and industry will be consumer driven. Where innovations are consumer driven there is a requirement for personal responsibility to be very focussed on sustainable

development in order to create the demand for sustainable technical innovations. While innovation is a positive and creative way to address some of the problems relating to sustainable development, the drivers for innovations may perpetuate non-sustainable development.

3.4.3 Political

Perhaps the most challenging aspect of implementing Agenda 21 is in regard to the trade off required during decision making. How decisions are made will be a consequence of the political and cultural environment within which they are made. This is the area where the theory of ecological modernisation has sought clarity on feasibility of implementing decisions that could be described as sustainable.

In order to be a feasible plan for action Agenda 21 has to contain factors that will assist in meeting the objectives of the document. In particular this includes incentive for political co-operation and an ability to ensure that sustainable development issues are kept at the forefront of politicians' minds when other priorities arise in their domestic settings.

Certain factors were missing from the final document as a result of the difficult negotiations at Rio. There were no legally binding targets for the reduction of greenhouse gases, one of the fundamental global problems that requires a global solution. This is a problem that Agenda 21 recognises as having potentially catastrophic

implications for food security. There was no call for Northern countries to reduce resource consumption. This was a key issue for the Southern countries that were interested in achieving reduced resource consumption from their perspective, i.e. there are limited resources that should be shared by all countries. Global economic reform to reverse the South - North flow of resources, improve the South's terms of trade and reduce its debt burden was not something which was called for by either the North or the South. However for many of UNCED's spectators this measure is a key part of a move towards real sustainable development.

In relation to other aspects of Agenda 21, there is no ban on exports of hazardous wastes or on "dirty" industries in Agenda 21 despite these issues being acknowledged as a major problem. Agenda 21 does not address the real issues behind forest destruction proposing that planting trees may be sufficient measure to stop the problem. However this does not take into account the need for saving the societies that live in existing forests and protecting the forests that support them. There is no recommended action to deal with nuclear energy use. The transition to renewable fuels is mentioned and it is expected from Agenda 21 that this transition will be made through technological advance and not through banning use of existing nuclear fuels, which carry a measure of risk. The dangers of biotechnology were absent from the agenda at Rio. The main solution for problems relating to loss of species and habitats seemed to be biotechnology.

Agenda 21 encourages free trade and the environment is treated as a subsection of free trade rules. Reconciliation of trade with environmental protection would be a positive move towards sustainable development. The problem appears to be a conflict of interest between the two with trade being favoured compared against environment. There is no strong international regulation of transnational corporations. The only agency that undertook anything like this was the UN Centre on Transnational Corporations that ceased to operate shortly before the Rio conference took place.

The preparatory reports, Brundtland and the South Commission, both emphasise the dependence of Agenda 21 on national government activities. The principle concern of the UNCED was global problems and the conference was established to find global solutions. However with the emphasis on industrial development throughout the document and the need for economic growth many factors were viewed in the traditional national sense. Many of the solutions cannot be implemented by national governments alone and without high-level international co-operation any attempt to implement the solutions is bound to fail. Conversely Agenda 21's treatment of the global commons prevented the community perspective from being used to tackle this problem. Often commons problems are noticed and understood best by local communities but communities were not made responsible for identifying the problems or empowered to deal with them. This is despite Agenda 21 offering action at the level most suited to deal with it as one of its guiding principles, the principle of subsidiarity.

The heavy negotiations at Rio led to a lack of leadership on Agenda 21; no particular country was prepared to take the lead and with insufficient emphasis on global governance the UN was left in weakened position as the arguably natural leader for progressing Agenda 21. In addition an absence of trust between the North and the South displayed at the negotiations and enhanced by the unfulfilled promises of donor financial assistance is likely to contribute to more difficult negotiations in the future. Having established that a follow up conference would take place in 1997, and now a further one in 2002 will continue the requests for political support. Levels of political commitment are not always guided by firm beliefs in a need for sustainable development but can be influenced by timely opportunities to make an international impact for political gain.

Political decision making at a national and more localised level is a component of ecological modernisation theory, which encourages alternative and innovative policy measures to be explored (Roberts, 2003). The theory advocates an approach that moves away from top down regulatory approaches and instead works with more negotiation with industry, the increasing involvement of non-governmental organisations and a framework where political and economic globalisation are supportive (Sonnenfeld, 2000). Ecological modernisation will require strong integration of departmental objectives in institutions so that they become self-reinforcing. However the extent of change required is such that it may actually demand a reappraisal of existing institutional boundaries (Gouldson and Murphy, 1996). The theory is not offering specific solutions to the problems associated with decision making for sustainable development and

although efforts are being made to explore the issue in the literature, there remains a failure to consider the global implications and the implications of globalisation on theories associated with ecological modernisation.

The significance of the issues that were not addressed, the problems with subsidiarity and the lack of leadership at an international level all undermine the political feasibility of Agenda 21. The failure to address key factors such as consumption, equity and natural resource management means that efforts to address sustainable development within the remit of Agenda 21 are at best limited.

3.5 Conclusions

"*The inability of capitalism even to begin to solve the social and environmental problems it has created was demonstrated to the world with breathtaking clarity in June 1992 at the UNCED*" (Treece, 1992).

When it is considered that two strongly opposing views, i.e. that of the environmentally concerned North and the poverty stricken South, were presented at Rio, it is difficult at first to understand that the solutions they each perceived for their respective problems were so similar. The message from Rio and from each apparent opponent was a unified view that more growth, more trade, more aid, more science, more technology and more management would lead to the required solutions for each. Therefore the political feasibility of the exercise appears to be unquestionable since all governments were in favour of the proposed measures.

However in another sense the political feasibility of Agenda 21 is severely handicapped by the fact that Agenda 21 failed to address some of the fundamental issues that the popular definition of sustainable development seeks to solve. As the quotation above suggests the actual political approach of Agenda 21 and its underlying dependence on capitalism is too restricted to achieve sustainable development. It was partly through the refusal of the US government to sign binding agreements on biodiversity protection and atmospheric emissions that the agreements made at Rio were so significantly weakened. The lack of targets and the emphasis on market mechanisms over regulations further weakened political feasibility. The US refusal to sign binding documents led to an inadequate response to a huge problem. This refusal to sign was in part attributable to the pressures of multinational industry and the perception by governments and business that any more far-reaching agreements might have a negative effect on competitiveness.

The irreconcilable differences between the agendas of the North and the South, many of which were not properly addressed at Rio, are the key to the failure of the summit. The North was determined to offload global environmental responsibility onto the South. This contrasted with the South Commission's primary and almost only concern for economic development regardless of environmental impact in the South, and their view that Northern over-consumption was the cause of environmental problems. These contrasting views created the differences that ultimately led to an agreement that was considerably weakened (Treece, 1992). Efforts to seek innovative policy solutions for decision making through the developing theory of ecological modernisation are lacking

insight into the effects of globalisation and how such policies might address the global situation.

The financial feasibility of Agenda 21 is weak because of reduced donations, a lack of demand for grants with a sustainability focus and an unclear level of commitment from the private sector towards funding such activities. Given the emphasis in the document on increasing competitiveness it could be assumed that the private sector contribution to Agenda 21 would be generated by the consequent increase in wealth and profit. However Agenda 21 was neither explicit about this nor was any provision made for means of distribution of this finance. The emphasis on the use of market mechanisms suggests that the wealth would be distributed through the application of taxation but again there is no actual commitment in Agenda 21 to this effect. The setting of market mechanisms to redistribute wealth to sustainable goals is therefore the responsibility of national governments.

The technical feasibility of Agenda 21 may be a success since the emphasis on innovation to reduce dependency on natural resources is presented by Agenda 21 as the solution to all issues relating to sustainable development. Innovation is very much a part of competitive behaviour and as such is not only strongly encouraged by Agenda 21 but also is widely accepted by both governments and industry as a desirable, if not essential, activity. While innovation will be successful in implementing Agenda 21 it may not be

successful in implementing sustainable development depending on whether or not the net effect of innovation increases consumption.

Agenda 21 is actually a document that raised public awareness, government awareness and awareness amongst business and industry of environmental degradation issues and how they are all linked. Regardless of the strong emphasis on economic growth and competitiveness in Agenda 21, its ethos remains sustainable development and advocates of sustainable development can promote it under the banner of a global policy agreement that strengthens their position. It is possible that this ethos may be used to promote more sustainable national activities within the priorities established by Agenda 21. Agenda 21's priorities are broad enough to be interpreted with the full perspective of sustainable development. They are quality of life, use of natural resources, sustainable economic growth, global commons, management of human settlements and chemicals and waste management.

The solutions to sustainable development were presented as increased economic development and trade with more northern aid for southern countries and business as usual increasing efficiency of resource use through technological innovation that increases the wealth of individual nations. The level of awareness of Agenda 21 has assisted professionals concerned with environmental degradation to promote their views and actions but this work remains within the limitations of the current development model. Having no set definitive targets it is difficult to measure the success of Agenda

21 in terms of prevention of environmental degradation but in terms of increased development and technological advance and efficiency perhaps its success will be easier to measure.

Agenda 21, and consequently the theory of ecological modernisation, have failed to address the most challenging features of sustainable development: consumption, resource depletion, equity and an increasing dependence on international trade. In fact the approach of Agenda 21 and ecological modernisation is dominated by the BCSD perspective and reflects an approach that is partly compatible with competitiveness. Agenda 21 is arguably a policy tool for implementing sustainable competitiveness and does not address the externalities to sustainable competitiveness: consumption, equity and resource depletion. However its existence has created a momentum that facilitates national activity and particularly locally based activity through Local Agenda 21. As noted above it is still possible to make national interpretations to suit national circumstances and priorities.

This analysis of Agenda 21 raises some issues that require to be addressed in the data gathering for the thesis. In particular it is of interest to understand the approach that business is taking to implement sustainable development and how this is perceived in relation to competitiveness. In addition the role of innovation that is implemented by the private sector or encouraged by the public sector is also of significance. Equally interesting is the extent to which business and industry take public sector policy into

account in planning and implementing their activities regarding sustainable development. In relation to the public sector it is of interest to seek clarity on perspectives of responsibility and the activities that the sector takes to encourage business and industry to undertake the priorities set out for that sector in Agenda 21, i.e. promoting cleaner production and responsible entrepreneurship.

Before examining the national activities and perspectives of Agenda 21, sustainable development and competitiveness in Scotland in later chapters, some examples of implementation at a global level are analysed in the following chapter. These examples of public and private sector implementation offer insight into the practical interpretation of sustainable development for business and the key issues that will be addressed during the data gathering for the public and private sector efforts in Scotland.

CHAPTER FOUR: FROM POLICY TO PRACTICE

4.1 Introduction

Sustainable competitiveness is a concept, presented in Chapter Two, that describes how sustainable development and competitiveness can in part be reconciled. It is a concept based on assumptions about how governments and companies choose to implement policies and strategies. Sustainable competitiveness has a number of features that rely on aspects of sustainable development and competitiveness being managed for reconciliation. In particular the conservation of natural resources, the inequity in resource depletion and distribution of wealth and the role of innovation in creating increasing consumer demand are areas where appropriate management can result in sustainable approaches but where inappropriate management is likely to hinder implementation of sustainable development.

Both governments and firms can influence the management and implementation of sustainable competitiveness. Government can set conditions by establishing limitations through regulations, market mechanisms or voluntary agreements and influencing conditions for production (factor conditions). Factor conditions should be targeted to creation of GDP and management of that, increasing innovation for sustainable development and discouraging displacement of problems. Company strategies too, particularly companies with innovative leading styles of management, can have a significant influence on the impact of company activity in relation to sustainable development, specifically resource use and approaches to innovation.

The objective of this chapter is to review some of the most innovative worldwide examples of government-led and industry-led management for sustainable development. The examples in this chapter complement the earlier literature review in identifying practical ways in which both government and industry can strive towards reconciliation of sustainable development and competitiveness. The examples have been selected to show a broad range of activities and many examples of other similar approaches to those presented here exist. The second section of the chapter describes and analyses the role of the public sector in terms of regulations, market mechanisms, voluntary agreements and the influence on factor conditions. The third section of the chapter addresses the role of the private sector. The chapter concludes in the fourth section with a framework for analysing the impact of activities intended to implement sustainable development in the business and industry sector. Conclusions on the key features of practice to consider in gathering data for practice of both public and private sectors in Scotland are also presented. In Chapter Two the theory of ecological modernisation was discussed and the types of activities it advocates were mentioned. Some of the examples following are demonstrations of ecological modernisation in practice, and where this is the case ecological modernisation is referred to.

4.2 Public Sector Roles

The sections following describe the government-led role in setting limitations to company behaviour through regulations, market mechanisms and voluntary agreements and in influencing factor conditions. The examples have been identified

through the International Institute of Sustainable Development[17] (IISD) which has a remit to advance policy recommendations on international trade and investment, economic policy, climate change, measurement and indictors, and natural resource management to make development sustainable by working on global collaborative research and reporting projects. A fuller description of each example given is cited in Appendix Nine.

4.2.1 Regulations

Setting regulations is a means for government to establish fixed standards and to communicate their tolerance for particular activities. Often regulations are set to enforce a minimum standard and the government will not tolerate operations that do not meet this standard. Regulations are very prescriptive and require a clear focus to enable enforcement activity. However, this does not preclude the involvement of business in developing regulations and the use of regulations to educate and alert companies to changing international pressures. For example in 1997 the Egyptian government established a programme to phase out ozone depleting substances (ODS)[21]. The regulations proposed anticipated international standards and offered a phase-in period giving companies time to adapt to the new standards. The countries largest manufacturer of ODS responded positively to the new regulations perceiving them as an opportunity to overhaul production and develop new markets abroad. Thus in this case collaboration with industry facilitated fast improvement to emissions

---

[17] See http://www.iisd.org for more information

[18]For further information see Example A in Appendix Nine: Ozone Depleting Substances Phase Out Strategy, Egypt

of ODS and increased industrial competitiveness, whilst simultaneously stimulating innovation.

Regulation of standards can be perceived as an intrusion of government into competition that undermines competitive advantage. However the reverse can be true. Particularly beneficial are stringent regulations anticipating standards that will spread internationally, by creating a first mover advantage (Porter, 1990). For example, in tightening regulations on air pollution, the European Union has for the first time harmonised standards with the United States[22]. This is specifically in regard to emissions standards for mobile machinery. The regulations anticipate international standards and have created a new level playing field for production of machinery types specified by the regulations. Regulation undermines competitive advantage, however, if a nation's regulations lag behind those of other nations or are anachronistic (Porter, 1990).

Regulation can contribute to encouragement of innovation and some argue is a requirement to promote innovation for environmental improvement[20]. Regulation can create a pressure that motivates companies to innovate and overcome organisational inertia. It can also improve environmental quality in cases where innovation and the resulting improvements in productivity do not completely offset the cost of compliance. Regulations can alert and educate companies about the likely resource inefficiencies and potential areas for technological improvement and they can raise

---

[22] For further information see Example B in Appendix Nine: Transatlantic Norms Agreed on for Mobile Machinery Emissions

[20] See for example Porter and Van der Linde (1995a) and (1995b) and Palmer et al (1995)

the likelihood that product and process innovations in general will be environmentally friendly. Regulations can also create demand for environmental improvement until companies and customers are able to perceive and measure the resource inefficiencies of pollution. Lastly regulations can level the playing field during the transition period to innovation based environmental solutions ensuring that one company cannot gain position by avoiding environmental investments (Porter, 1995c).

The attributes of innovation friendly regulation are described by Schmidheiny as phase-in periods, market incentives, stable and predictable regulatory periods and business participation in the setting of standards (Schmidheiny, 1995). For example, the design of the energy efficiency standards for refrigerators in the United States is innovation friendly[21]. The US government took a tough stance on the deadline for implementation of legislation that encouraged source reduction of HCFCs. This was to be followed by a further piece of legislation banning HCFCs altogether. The regulations were therefore highly predictable, and offered a phase-in period enabling industry to plan innovation to meet the new regulations.

There is an ongoing debate about the cost of regulation and its effect on competitiveness of business and industry[22]. The actual and perceived costs of compliance with regulation are often different. Costs of compliance are often high at the early stages of implementation as a result of a need for innovation. The outcome of innovation and resource productivity motivated by regulations is to reduce costs of

---

[21] For further details see Example C in Appendix Nine: Energy Efficiency Standards for Refrigerators

[22] See for example Porter (1995), Palmer et al (1995), Woolard, (1995) and Portney (1995)

compliance over time. This means that estimated compliance costs by companies represent an upper limit (Porter, 1995).

The costs of complying with regulations can be three times as high as addressing the problem under a voluntary agreement, argues DuPont (Woolard, 1995). This is because regulation-driven work focuses on eliminating specific substances and using specific technology on a set schedule leaving little opportunity for the synergies of an integrated approach or innovation to seek new approaches. However, as the example of cutting packaging waste in Canada demonstrates, setting regulations does not preclude a synergistic, integrated approach with industry, nor the use of innovation[23]. The approach used by the Canadian government invited industry participation in setting standards for the reduction of packaging waste and established demand for environmental improvement by involving other groups in the development of the regulations. The regulations were set to achieve a target for reduction of waste but were not prescriptive about how that was achieved, instead inviting industry to recommend the solutions.

In recent years regulators have embraced the polluter pays philosophy for development of new regulations. Another popular choice of regulators for environmental protection is the source reduction emphasis whereby companies are encouraged to utilise material substitution and closed loop processes to minimise pollution before it occurs. Framing environmental improvement in terms of resource productivity sends clear messages about the use of natural resources. Regulations that

focus on opportunity cost pollution, wasted resources, wasted efforts and diminished product value to the customer are likely to achieve this. At the level of resource productivity, environmental improvement and competitiveness come together, meaning that regulations that are focussed on resource productivity are not likely to be anti- competitive (Porter, 1995a/b/c, Popoff, 1995).

The examples of sustainable competitiveness regulations above demonstrate conservation of natural resources and innovation but do not address inequities in distribution of wealth or resources at all, nor do they tackle the issue of increasing levels of consumption. The examples are in line with first stage ecological modernisation, i.e. reflect the principles of industrial ecology but ecological modernisation does not actually advocate the use of regulations suggesting instead that reconciliation can be better achieved using market mechanisms and voluntary agreements.

4.2.2 Market Mechanisms

Market mechanisms are broadly perceived by business and industry as a government tool that encourages specific firm or consumer behaviour while promoting innovation and costing less than regulations (Schmidheiny, 1992). Market mechanisms can encourage materials substitution to reduce pressure on non-renewable natural resources or change consumer behaviour to reduce consumption.

---

[23] For further details see Example D in Appendix Nine: Cutting Packaging Waste, Canada

There are a wide variety of possible ways to administer market mechanisms. For example, countries can operate deposit refund schemes that reimburse an individual or industry on return of certain products for reprocessing. Green procurement demonstrates government leadership by requiring that government agencies or departments make purchasing decisions based on the full impact of a product, for example buying recycled paper in preference to paper from virgin sources. Charge systems and taxation are other well-known market mechanisms and each of these is described in more detail below. Market mechanisms are perceived by business as less prescriptive than regulations because there is the option to continue the behaviour that is discouraged by the market mechanisms by paying some sort of charge, such as increased cost per unit of pollution or product.

Charge systems imposing charges on use of certain products to influence market behaviour is one form of market mechanism. An example of a charging system is in Germany, aimed at industries discharging a range of pollutants to the aquatic environment[24]. The German Government operates the Waste Water Charges Act aimed at reducing the amount of waste and other pollutants that are introduced into Germany' aquatic environment. The charge is determined by volume and noxiousness of the discharges and includes a range of parameters including phosphorous and nitrogen. The charge is payable to Laender (the local government administration) and may only be spent on measures to protect the aquatic environment.

---

[24] For more information see Example E in Appendix Nine: Charge Systems: Germany and Hungary.

A second example of a charging system is aimed at petrol producers or importers in Hungary[25]. The Hungarian Government has established a product charge on petrol. The aim of the product charge is to raise revenue for protective measures to solve transport related pollution problems. Petrol producers or importers pay the charge. The redistribution of funds through a Central Environment Protection Fund, which also draws funds from other environmental fines, product charges, tax revenues and grant funds, could arguably educate and alert beneficiaries of the grant and interest-free loan fund used to redistribute the monies raised for priorities in improving the environment.

Both charge systems raise revenue for the specific problems they are trying to address and both leave the polluters free to choose whether to pay the charges or innovate to reduce the charges levied. Other systems of offering grants and loans to encourage specific behaviour are also used.

Fiscal instruments are another widely used system of sending signals about government priorities. Italy's plastic bag tax is aimed at encouraging alternatives to plastic bags and reducing the amount of waste plastic[26]. By levying a tax on importers and producers, the Italian government created a signal to the market economy that the cost of plastic bags was greater than the alternatives. This system although very simple has reacted to the environmental impacts of plastic bags, particularly in relation to marine litter and dolphin safety, and sent a clear signal about their undesirability. Over a four-year period of implementation of the tax program the government raised around US$150M.

---

[25] As above in Example E.

The Danish Government has implemented the Wind Energy Programme to reduce CO_2 emissions from 1988 levels by 20% by 2005, to reduce SO_2 emissions from 1980 levels by 80% by 2000 and to increase the share of Denmark's gross energy consumption provided by renewable energy to 35% - 50% by the year 2030[27]. Denmark levies a tax on all electricity and the basic support mechanism for wind energy is partial rebate of this tax. Together the taxes account for about 7% of domestic revenue. The complex tax system, which includes 15 subsidy schemes related to energy production and consumption, complements other government measures aimed at encouraging the wind energy industry such as grants partnerships and regulations. The tax system has clear long-term goals and works to change consumer behaviour, create markets and encourage materials substitution.

Both Italy's plastic bag tax and Denmark's Wind Energy Programme have been used to raise national revenues whilst communicating clearly about government priorities to protect the marine environment and encourage use of renewable energy respectively..

Recognising that substitution of materials might play an important role in the reduction of the environmental impact of production, Kandelaars seeks to determine the factors that affect the choice of materials in production in the specific case of the automobile industry (Kandelaars and Van Dam, 1998). The study concludes that in

---

[26] For more information see Example F in Appendix Nine: Fiscal Instruments, Italy and Denmark
[27] As above in example F.

this particular case the price of the raw materials has little impact on the producers' choice to use them. Thus a levy or subsidy to influence choice of materials is unlikely to be successful in its aim in this particular case for aluminium or plastics. It is speculated that some of the factors that influence this decision are the low cost of the materials relative to the processing costs, and the likely slow change in production processes. Other factors that are assumed are the fuel efficiency dependent on the weight of the car and the fact that road tax is dependent on the weight of the car. This demonstrates the limitations of this type of study that the author recognises. For every material and process a separate study would require to be undertaken and also for different policy environments as the road tax issue demonstrates. The author further recognises that where policy makers wish to reduce the consumption of a particular material they must take into account the possibility and scope for substitution of that material which might include materials with a more damaging effect on the environment either through extraction, processing or disposal. Ecological modernisation encourages use of market mechanisms and through its relationship to industrial ecology advocates an approach that could require life cycle analysis of a wide range of products leading to an increase of this type of problem in implementing market mechanisms. However the example of Denmark's Wind Energy Programme, which has contributed to Denmark becoming one of the world's leading producers of wind turbines, shows how market mechanisms to encourage material substitution can also contribute to industrial and national competitiveness.

The success of using fiscal incentives to change consumer behaviour is limited. Stoneman and Battissi find that in the case of unleaded fuel, the success is extremely

limited. It is suggested in their paper that increasing the price differential between the leaded and unleaded fuel options might have greater success but that the differential would need to be substantial to influence this change (Stoneman and Battisi, 1998).

The success of the market mechanisms described in the examples is mixed. However the examples do show that a wide range of types of market mechanisms are available. Market mechanisms can be applied to wide range of environmental issues, although in a prescriptive material specific way, and they can range from very simple levies to complex tax systems such as that of the Danish Wind Program. The practical examples of market mechanisms cited are no less prescriptive about materials than regulations are. The main difference is the option to reduce use of materials that market mechanisms give rather than the lack of option dictated by regulations.

4.2.3 Voluntary Agreements

The potentially high cost of regulations and lack of effectiveness of market mechanisms leads onto another possibility for governments. There is a growth in importance of voluntary agreements as a substitute for regulatory and market mechanisms. The OECD defines voluntary agreements as follows:

> *"An agreement between government and industry to facilitate voluntary action with a desirable social outcome, which is encouraged by the government, to be undertaken by the participant based on the participant's self-interest."* (OECD, 1998c, pp5)

Some view the use of voluntary agreements as a mechanism of delegation from state to firm. Leaving environment strategy as the responsibility of firms is risky because of the complexity and uncertainty of environmental problems. National and public

institutions as well as citizens through NGOs, public debate and so on, all have a role to play in the choices of environmental technological pathways as well as the firms using them. Omitting the voice of these groups by devolving responsibility to firms through voluntary agreements reduces accountability and can be potentially harmful to both sustainable development and competitiveness.

Voluntary agreements can be used as a complement rather than a substitute for regulations and market mechanisms creating a much more powerful tool than as a substitute. For example, the Norwegian environment ministry has concluded agreements with the aluminium industry that aim to cut greenhouse gas emissions by 55% per ton of aluminium produced from 1990 levels by 2005[28]. If production remains stable, Norway's overall greenhouse gas emissions would be reduced by 4% CO_2 equivalent over the same period. The agreements between the government and companies such as Hydro Aluminium, Elkem Aluminium and SorNorge Aluminium are the first of their kind in Norway. Emissions from the aluminium industry are not currently covered by Norway's CO_2 tax, but the government has announced it will impose taxes or regulations on the industry if it fails to live up to its commitment. In return for the industry investing in emissions cuts, the government guarantees it will lower costs for companies in other areas of their operations so as not to put them at a competitive disadvantage.

---

[28] For more information see Example G in Appendix Nine: Norwegian Aluminium Industry in Greenhouse Gas Agreements

Thus voluntary agreements can be used to aid compliance with regulations but the question of whether or not voluntary agreements are acceptable as valid policy instruments is not answered as yet (OECD, 1998c).

In terms of the use of voluntary agreements to enhance competitiveness and increase resource productivity there is some merit in the use of environmental management systems such as ISO 14000 and the Eco Management and Audit Scheme (EMAS). Corporate executives state that increasingly they perceive certification under ISO 14000 to be essential for the maintenance of global competitiveness and sound environmental practice (Gute, 1995). In addition the shift towards the use of environmental management systems is viewed by some as an important precondition for a less command and control biased regulatory framework (for example see Steger, 1995).

It is possible to have government-led voluntary schemes that are developed in agreement with industry and that are flexible and targeted to specific problems. For example, a voluntary agreement was initiated by the major global producers of brominated-flame-retardants (substances applied to furniture, appliances and textiles to prevent or minimise the occurrences of fires) who committed themselves to take certain actions to reduce the risks posed during the manufacture and disposal of these substances[29]. These actions include such things as committing themselves not to manufacture or import certain individual flame-retardants, using the best available techniques to improve the purity of others and to minimise the levels of releases that occur during manufacture. Beginning in 1998 and every two years thereafter,

companies are to report on progress to the OECD's policy body on chemical safety. If sufficient progress is not made, OECD governments may consider other appropriate actions. This shows how the OECD is encouraging manufacturers of Brominated Flame-Retardants to reduce the risk involved in manufacture and disposal of its product. The agreement to employ Best Available Techniques encourages innovation although no targets have been specified.

A further example of product specific voluntary agreement is in the Netherlands where fifteen parties involved in energy production and sustainable consumption in The Netherlands have signed a voluntary agreement with the Dutch government to increase the use of photovoltaics (PV) solar power for housing and other buildings[30]. The parties, including representatives of power utilities, PV system suppliers, and the construction industry, sought more than a 10-fold increase in the number of buildings powered by PV energy up to the year 2000. The Dutch Minister of Economic Affairs has said that by strengthening the domestic PV industry and market, the country could establish a strong export position as well, selling the systems to developing nations.

In each case however it is important to note the government has suggested it will back up the measures with more forceful implementation methods such as a market mechanism or a regulatory instrument if the industries involved fail to meet the agreed targets. These examples show the potential of voluntary agreements to enable

---

[29] For more information see Example H in Appendix Nine: OECD Voluntary Industry Commitment on Brominated Flame Retardants

[30] For more information see Example I: Dutch Utilities Sign Agreement on Solar Power

innovative solutions to environmental issues to be found by industry itself within government guidelines and particularly in the case of the Dutch Solar Power agreement, the potential to create new markets for a sustainable future. Such agreements are advocated by ecological modernisation.

4.2.4 Factor Conditions

The ways in which governments can influence factor creation vary considerably but on the whole those that create the environment for continuous improvement are most competitive. In general terms there are issues of whether the approach should be dynamic or static; advanced factor creation as opposed to basic; whether industry should be involved in factor creation and how locality can affect it. Dynamic conditions are favoured over static ones for factor creation because the constant state of change can create the right atmosphere for continuous improvement, itself a key element of competitive advantage. Advantage is sustained because its sources are widened and upgraded, partly through creation of advanced factors. Some determinants provide a more sustainable basis for advantage than others. The current pool of factors, for example, is less important than the presence of specialised and pre-eminent institutions for factor creation. Broadly, conditions that provide dynamic advantages (such as factor innovation, early mover advantages, pressures for upgrading) are more important than those conferring static advantage are (such as factor costs, or a large home market). Education and training perhaps constitute the single greatest leverage point available to all levels of government in upgrading industry.

Governments can establish programmes that support and encourage innovation for sustainable development. For example, in Australia the EcoReDesign Programme aims to assist Australian manufacturers from a wide variety of sectors to improve the environmental performance of their products through innovative research, design and development strategies[31]. This example shows how government can support and encourage innovation for sustainable design and promote its use widely.

Education and in particular the development of specialised skills is a key area which can enhance competitive advantage. The underlying assumption is that basic levels of education are seen as a basic factor for competitive advantage. From this base the higher levels of skills can be developed as required by the firms based in a given nation. In parallel with this education was a constant theme through many of Agenda 21's six dominant themes. Firstly quality of life relates to issues such as full employment and control of population both of which have foundations in all members of the population having a basic level of education. In the management of human settlements, the proposed solutions in Agenda 21 are to continue building and developing but in increasingly energy and resource efficient ways. Hence there is a need for training and skills development to allow this to take place. The need for innovation by definition also creates a need for education. It needs to be easy for all people to get access to higher and further education for long-term competitiveness (Strange, 1998).

---

[31] For more information see Example J in Appendix Nine: Australian EcoReDesign Programme

An example of education in relation to business activity can be seen in India where the government has launched a campaign to encourage the formation of waste minimisation circles[32]. The groups meet periodically and exchange information on waste reduction efforts. A resource person from universities or technical institutions feeds possible solutions into member firms by supporting the discussion circles. This example shows how governments can support relationships between industry and further education with a view to reduce waste, thus boosting productivity and improving environmental quality.

Firms compete in industries, not nations: industry reads the market better than the best civil service making government's most powerful roles indirect rather than direct ones. Government can involve industry in determining what factors are created and encourage firms to play a prominent role in factor creation. Governments need only play a direct role only in those areas where firms are unable to act (such as trade policy) or where externalities cause firms to underinvest. Externalities occur where the benefits to the nation as a whole exceed those accruing to any single firm or individual, so that private entities will tend to underinvest in such areas from the perspective of the nation. General education, environmental quality and some types of R&D that can boost productivity in many industries are all externalities. Thus it is important for government to engage in partnerships with the business and industry sector.

---

[32] For more information see example K in Appendix Nine: Waste Minimisation Circles, India

The partnership approach is demonstrated in the example of industrial ecosystems in the United States[33]. The project developed assists companies in understanding the potential to reduce wastes and use other companies' wastes as raw materials through the provision of an information resource about material flows. In particular this example shows how applied dissemination of information can be used to improve the waste management of companies resulting in significant savings. All the examples above demonstrate the flexible approach to seeking solutions that can be achieved by working in partnership.

One of the most significant roles government can have is in signalling by identifying and highlighting national priorities. Government can shape attitudes towards particular problems in industry. One example on green procurement in Sweden outlines how this can be achieved[34]. In this case the municipal government agency is taking a leadership role in setting priorities for product manufacturers and setting a phase-in period to enable them to adapt to its requirements.

Government also has a role in slow acting policy levers such as creation of advanced factors, encouraging domestic rivalry, shaping national priorities and influencing demand sophistication. An example of eco-labelling in Australia shows how governments can educate and inform consumers with the possible outcome that consumers gain increased demand sophistication for more eco-friendly products[35].

---

[33] For more information see Example L in Appendix Nine: Industrial Ecosystems at the Metropolitan Level

[34] For more information see Example M in Appendix Nine: Green Procurement, Sweden

[35] For more information see Example N in Appendix Nine: Eco Labelling, Australia

The government role described above is tough and disciplined requiring a long-term approach and not a short three to four year business plan or election focussed approach. Uncertainty over public policy in certain areas can affect further spending and decision-making on environmental issues. A lack of international consistency also affects decision-making by firms and this is a particular problem in the European Community where there are a number of inconsistencies in the implementation amongst nation states on EC Directives (NEDC, 1991). A further important distinction is between the content of standards and the process of administering them. National advantage is enhanced by stringent standards that are rapidly, efficiently and consistently applied. This defines the leadership role that a government creating sustainable competitiveness needs to take.

A nation's competitive advantage in industries is often geographically concentrated. This emphasises the role of local government. As much or more attention is necessary at the regional and local level, in areas such as university education, infrastructure, local regulations, local research initiatives and information. The local administration also delivers Local Agenda 21 (LA21), as outlined by Agenda 21, and this offers opportunity for LA21 or local economic development activity to develop sustainable competitiveness policies and implement them.

While ecological modernisation advocates a more consensual approach to policy making than the implementation of regulations, by engaging industry together with a focus on innovation, the texts on the theory to date make little reference to the role of

ecological modernisation in generating sustainable factor conditions. This is a significant aspect of reconciling sustainable development and competitiveness.

4.2.5 Summary of Key Points

The public sector examples described earlier in this section reflect a number of possible ways in which government and local governance organisations such as local authorities can influence behaviour amongst the business and industry sector making it more sustainable. In the examples given, influence has been generated by:

- Implementing regulations
- Implementing market mechanisms both through penalties such as taxation and incentives such as subsidies
- Encouraging innovation and consequently new market potential
- Responding to unsustainable global trends, such as global warming and ozone layer depletion
- Demonstrating government leadership
- Facilitating partnerships both to generate voluntary agreements seeking more sustainable production and to develop more sustainable approaches to existing production methods
- Offering and validating information, training and dissemination of knowledge in applied situations
- Deployment of appropriately trained staff to support sustainable activities

This demonstrates a mixture of approaches from traditional regulatory techniques for influencing behaviour to creation of factors. The influences above can also be described as either drivers or support mechanisms. Certain of the influences drive behaviour by creating an incentive to address the issues. This is often by creating a

pressure such as regulations, financial pressure through market mechanisms or changing trends such as global trends that can either create a pressure to regulate or govern more closely or creating opportunities such as new market potential. Some of the influences described above offer a support mechanism that makes implementation of more sustainable practice achievable through other means than a response to pressure. Demonstration of government leadership is one such support mechanism providing clear and early signals about forthcoming drivers, especially regulations and market mechanisms and thus enabling an early mover response and consequently creation of competitive advantage. Other support mechanisms that link to government leadership are the creation and enhancement of partnerships that either communicate or influence the government position on a particular issue, as well as supplying additional resources to make activities more sustainable. Support mechanisms include the dissemination of knowledge and information to either producers or consumers making their production and consumption choices more informed and generating skills and specialised training that enables more sustainable activities to be undertaken. Staff resources especially where these are linked to further edueation and training can also support more sustainable activities.

The examples presented earlier in the chapter of government influence are demonstrating particular types of sustainable activity as described below:

- Engaging partners (industry stakeholders)
- Eco-efficiency (in process)
- Product lifecycle efficiency
- Creation of new products and markets

- Influencing decision making in industry

Much of the regulatory and market mechanism approach by governments is targeted towards encouraging reduction of emissions of specific pollutants or from specific products. There is an emphasis, in some of the examples, on CO_2 and ozone reductions, which relates government activities to global trends such as global warming and ozone layer depletion. This combined with efforts to reduce waste from production processes creates a strong relationship between regulations/ market mechanisms and eco-efficiency. However the market mechanisms and partnerships described in the examples also encourage some reduction in material use and material substitution, particularly in regard to energy and electricity use encouraging substitution of renewable energy for fossil fuel generated electricity. Partnerships for voluntary agreements also encourage changes in behaviour and are supported by government in areas such as reductions in material use and life cycle efficiency. Government leadership and knowledge dissemination is used to encourage specific consumer habits encouraging purchase of more eco-friendly products. Governments are also encouraging new product and market development through targeted innovation programmes and matching these in some instances to training and technical expertise encouraging a longer-term solution.

The examples described in the chapter do not address some specific sustainable development issues. These include:

- Non industry stakeholder engagement
- Corporate strategy influence and corporate responsibility

- Corporate strategy activity
- Demand and consumption
- Behaviour of individual consumers
- Natural environment issues such as biodiversity, land use, forest management
- Equity
- Corporate accountability and reporting
- Encouragement of business leadership
- Social responsibility

While the examples described address efficiency as a means to reduce resource consumption, they do not address the potential for innovation to increase demand for new products and therefore do not address over-consumption issues. The new markets and product design described in the examples is for more sustainable products, if not lifestyles. However these examples still may only be a small proportion of overall innovation and new product development since such examples are still deemed worthy of note and as such are not part of mainstream activity. In addition the government examples have no role in educating the general public or specific sectors of society. There is no government role described that encourages more accountability or reporting in the business and industry sector. There is nothing in the examples given that illustrates a long-term approach to resource use or equity, except the transfer to renewable energies in Denmark and Holland.

4.3 The Private Sector

The role that business and industry has in implementing sustainable development is not constrained by the same things that limit government activity on implementation. Business and industry are not constrained by the need for democratic accountability,

or by a requirement to meet conflicting priorities in social, economic and environmental terms. Business and industry in fact has a great deal of freedom to work any way it chooses within regulations and in any way that is responsive to market demands.

The BCSD suggested a number of features of good business practice that could be utilised to demonstrate business commitment to sustainable development while retaining competitiveness as a feature of business activity. These were outlined in Chapter Two and in summary include features such as the voluntary introduction of quality management systems, efficiency, innovation, material substitution and resource recovery. In addition to these features of well-managed businesses are a number of other things that business and industry are currently doing that takes a more holistic approach to sustainable development than that promoted by the BCSD to the UNCED in 1992. Such approaches include sustainable design, reporting and accountability, business leadership, social responsibility and development of new and more sustainable markets. All of these approaches contribute to competitive business behaviour according to the globally competitive companies implementing them. This section outlines a range of ways in which business and industry can behave responsibly in relation to sustainable development by offering examples of good practice. The examples describe companies that are working in the manner promoted by the BCSD and other companies that have taken their responsibilities beyond that approach. Further details of all the examples cited here are listed in Appendix Nine.

4.3.1 BCSD Approach

One of the main approaches to sustainable development promoted by the BCSD was Total Quality Management (TQM). This could be easily adapted and applied to environmental management creating environmental management systems. Much of environmental management involves increasing efficiency of production but some systems developed by companies extend the approach to include material substitution and resource recovery. Others use the environmental management system to encourage innovation in relation to any or all of these approaches to resource use in company activity.

The approach developed by Volvo is based on a TQM approach with lifecycle of resource use[36]. Life-cycle assessment (LCA) plays a central role in product development activities. Volvo says it is intensifying its 'preventive environmental activities' in order to ensure that the total environmental impact of its products is minimised. The average Volvo vehicle has a lifespan of 19 years, and LCA means paying attention to environmentally safe recycling and disposal techniques 20 years into the future. The use of life-cycle assessment revealed that more than 90% of the total environmental impact of Volvo products is generated during their useful life, as distinct from manufacturing and disposal activities. A particularly significant factor is fuel consumption, and for this reason alternative fuels and power trains are a high priority for research. Volvo's approach is highly environmental but does not take social responsibility into account.

Ebara has a similar aim to Volvo, in seeking to reduce its environmental impact, but has sought to achieve that in quite a different way[37]. Ebara, the first company to incorporate the 'zero emissions research initiative' (ZERI) concept, is a Japanese engineering firm with expertise in fluid control systems, environmental engineering and precision machinery. By developing specific technologies that seek to reduce pollution, Ebara has developed new products that could stimulate new markets. The use of a demonstration project at an eco-industrial park makes use of the technologies allowing potential new customers to view them in operation. The Ebara example demonstrates both pollution prevention and resource recovery but presents this in a way that demonstrates the use of innovation and that promotes market creation.

Industrial ecology is an approach to environmental management that addresses the lifecycle of environmental impacts by using waste products from one industry as raw materials for others. The example of Kalundborg shows a similar approach to that of Ebara in terms of industrial ecology[38]. Kalundborg is a small industrial zone 120km west of Copenhagen in Denmark. Over time, this unplanned industrial park has evolved from a single power station into a cluster of companies that rely on each other for material inputs. The project began in 1972 and by 1994 had negotiated 16

---

[36] For more information see Example O in Appendix Nine: Volvo, Environmental Management Systems

[37] For more information see Example P in Appendix Nine: Ebara, Zero Emissions Research Institute

[38] For more information see example Q in Appendix Nine: Kalundborg, Industrial Ecology

contracts. The extent of the material and energy exchanges in 1995 was about 3 million tonnes a year. The symbiosis has grown over the years to include partners from other districts, as well as farmers. The participants exchange materials and energy for mutual benefit, on the basis that the others can use by-products from one business as low-cost inputs. In addition to company efficiency improvements and reductions in waste, the use of the excess heat from Asnaes for household heating has eliminated the need for about 3,500 oil-burning domestic heating systems. Kalundborg closes the loop on an industrial estate creating opportunity that is fulfilled for conservation of resources, pollution prevention, waste reduction and resource recovery. There is also a possible social benefit from this project with the district heating system and the elimination of need for some oil-burning household heating systems. This project, unlike Ebara, lacks the innovation for new materials and the development of new markets focussing instead on existing problems.

Dupont takes a multi-faceted approach to sustainable development stating its vision for sustainable growth and incorporating issues such as efficiency, conservation, engagement with stakeholders, design, innovation in chemicals use, health and safety and resource recovery. To achieve sustainable growth, Dupont focuses on improved productivity to drive down costs, waste production, and energy demand. It has three core strategies:

- using its knowledge to reduce consumption of raw materials and energy;
- integrating chemistry, biology and technology to create products with greater societal value and lower environmental impact; and
- engaging stakeholders.

The examples used by the company show the heavy emphasis on innovation and eco-efficiency. The other features of sustainable growth appear to dominate the real corporate agenda less. However the company has clearly set itself ambitious and long-term goals reflecting its commitment to the environmental impact of its operations at least. The social element of DuPont's work is less clear and although the company engages with a wide range of stakeholders, this appears to be sporadic and inconsistent.

The examples of approaches to sustainable development by companies advocating the BCSD approach demonstrate that significant improvement to industrial efficiency and environmental management is possible. To a limited extent such examples also show that the environmental management approach can be applied to encourage innovation. Only one of the companies demonstrated consideration of social issues but this was limited. Overall the approaches are principally about company resource use with little consideration for other environmental impacts. The examples are in line with the theory of ecological modernisation, which encourages innovative policy solutions to motivate this kind of business behaviour.

4.3.2 Approaches Beyond BCSD Recommendations

In addition to the above examples of efficiency, resource recovery, materials substitution, innovation and quality management systems applications there are a wide range of other activities that companies can undertake that are sustainable while retaining or extending their competitive advantage. These include sustainable design, reporting and accountability, business leadership, social responsibility and development of new and more sustainable markets.

The sustainable design approach, adopted by AMP, demonstrates how, by encouraging and implementing innovation with sustainable development as a goal, products with a lower life cycle environmental impact can be developed[39]. AMP is a leading producer of electrical and electronic connectors, including cutting edge technologies in fibre-optics, wireless technology and sensors. The company defines Design for Environment (DFE) as ensuring that they meet their customers' demands in an environmentally responsible manner. AMP engineers gain a better understanding of industrial ecology while learning to use a simplified life cycle analysis tool when designing, developing, manufacturing, packaging and distributing AMP products. For example the combination of product design for the environment with appropriate training that is typical of AMP's approach combines the need for innovation with long-term environmental objectives and supports staff development to achieve this with focussed training. The Life Cycle Assessment approach used by AMP also indicates that industrial ecology is not anti-competitive.

Corporate reporting has a role in increasing corporate accountability and engaging stakeholders. In relation to sustainable development, this is a tool that provides necessary information to inform more open debate and consider more widely both social and environmental impacts of corporate activity. While many companies are starting to prepare corporate reports on sustainability, a key instigator of increased reporting has been the launch of a number of global indexes tracking more socially and environmentally responsible companies. The Dow Jones Sustainability World

Indexes (DJSI World) form one group of examples[40]. The DJSI World encourages more qualitative and quantitative reporting on sustainability performance from companies. It also facilitates investment offering an opportunity to identify increasing demand for more sustainable products and create a potential for business leadership in relation to sustainable development by indicating the performance of companies that lead the field in terms of corporate sustainability worldwide.

Business leadership can be undertaken in a more company specific sense where one company encourages its suppliers to behave in a more sustainable manner. Ikea takes a rounded approach to sustainable development focussing on both environmental and social issues and taking a leadership role in encouraging its suppliers to do the same[41]. Ikea also acts to engage stakeholders and responds constructively to campaigners by collaborating to find solutions to some of the environmental problems resulting from business operations. In September 2000, Ikea launched The Ikea Way on purchasing home furnishing products, a three-page 'code of conduct' for its 2,000 suppliers, focusing on working conditions and environmental impacts. As a first step, suppliers were asked to return a questionnaire to ascertain how well they already complied with the code. External auditors have been appointed to carry out more detailed reviews and to verify the information provided by Ikea's suppliers. Where shortcomings are identified, the companies will be asked to put in place an action plan to remedy them. The code warns suppliers: 'Repeated violations of IKEA's requirements will result in the termination of co-

---

[39] For more information see Example R in Appendix Nine: AMP, life cycle assessment
[40] For more information see Example S in Appendix Nine: DJSI, Sustainability Reporting
[41] For more information see Example T in Appendix Nine: Ikea, Corporate Sustainability

operation. Ikea is also keen to send its customers the appropriate signals about social and welfare issues. A two-page code of conduct relating specifically to the subject of child labour makes clear: 'Ikea disassociates itself from child labour, and works actively against it.' To this end, the retailer requires suppliers to keep it informed about where production is taking place - including the activities of subcontractors. In 2000 Ikea donated US$500,000 to a three-year project aimed at eliminating child labour in Uttar Pradesh, one of India's least developed states. The focus of the project is the introduction of education facilities for children and women alike.

Some companies such as Ikea are engaged in very specific activities to address social and welfare issues directly associated with their operations. Other competitive companies are also involved in widescale implementation of social responsibility initiatives. For example, Otto Versand is implementing a social quality standard and acting in a business leadership role by requiring its suppliers to adhere to the same standards[42]. The company is heavily reliant on imports from developing countries, particularly clothing and furniture. As such, it recognises the need to encourage socially responsible employment practices among its suppliers - not least for commercial reasons. The company's eventual aim is for its suppliers to achieve certification under the SA8000 scheme. Its efforts to promote social responsibility are carried out with this in mind. Offering supplier training and support to facilitate adoption of the standards further shows the company's commitment to social responsibility.

The examples above show that competitive companies can implement non-resource efficiency approaches to sustainable development and remain competitive. The approaches demonstrate the breadth of activity possible and highlight the important role of business leadership, demonstrating that it is not governments alone that can and do influence more sustainable behaviour, especially amongst smaller companies. Such examples highlight the importance of government leadership in communicating the appropriate messages about what is valued in relation to sustainable development. Although none of these examples contradict the ethos of ecological modernisation, the approaches taken are outwith the current thinking on ecological modernisation. Ecological modernisation has not to date considered supply chain influences in business, the business benefits of being socially responsible, nor the role of reporting and accountability to inform policy making.

4.3.3 Summary of Key Points

Business and industry takes a wide view of the possible ways in which it can implement sustainable development. An overview of the ways in which business and industry practice implementation is given below:

- Engaging partners
- Corporate strategy
- Reporting
- Eco-efficiency
- Accountability
- Product lifecycle

---

[42] For more information see Example U in Appendix Nine: Otto Versand, Social Responsibility

- New products and market creation
- Social responsibility
- Business leadership

The types of activity employed by business and industry in the field of sustainable development are further reaching than the government activity described in the previous section. While there remains an emphasis on efficiency that relates sustainable development to productivity, other aspects of sustainable development are also addressed. Innovation has a significant role here with emphasis on product design and materials substitution. However business and industry also claim to be involved in stakeholder engagement, in reporting sustainable activities and in supply chain initiatives demonstrating leadership amongst specific sectors, such as furniture retailing. Social responsibility is also undertaken both through implementation of quality systems and through supply chain codes of conduct. It is possible that all these activities are undertaken as proactive measures to mitigate potential business risk as stakeholder engagement and supply chain initiatives have been described as responses to pressure group recommendations and an interest in marketing the company with a specific responsible approach to business.

Business and industry also encourage training and it is possible that this is linked to a competitive approach through its influence on innovation in new product design and new market development. The tools used by business and industry relate to the factors already considered with some of them, such as environmental management systems, focussing on eco-efficiency and a long-term view to product lifecycle design. Others, such as social management systems, relate to business risk

management in operations that rely on potentially risky employment in developing countries. DuPont, whose mission statement relates to sustainable growth, also considers business strategy, for example.

The private sector examples describe ways in which business and industry can undertake sustainable behaviour. The influences that lead to such behaviour are as follows:

- Business risk
- Stakeholders
- New market potential
- Tools, such as management systems
- Staff resources and training that alters the value of existing staff

Some of these influences can be described as drivers while others can be described as support mechanisms, similar to the public sector examples described earlier. Business risk and measures to mitigate it or proactively turn risk into a business opportunity is a key driver for business activity. The views of stakeholders are also a key driver in business and industry and can have a strong influence on corporate strategy, particularly where a competitive interest in consumer demand drives the activities of particular companies. New market potential and the possibility of innovating to secure that is also a key driver of business and strongly linked to stakeholder interest. Tools and staff resources are two support mechanisms that can support business to more easily pursue specific ambitions.

The approaches described by business and industry fail to address issues relating to increased demand and consumption and in fact the approaches could be said to be encouraging further consumption by creating market specialisms in more socially and environmentally responsible products. The natural environment and the conservation of natural resources is not addressed either, except by resource management through efficiency in production and design. It is not clear from the examples given what role stakeholder engagement really does have in influencing business strategy and its importance to the companies is not expressly identified. However the approaches described by business do all appear to be in business interests and therefore it can be concluded that they add to, rather than detract from, corporate competitiveness.

4.4 Conclusions

The analysis of the examples above can be summarised by saying that neither the public sector nor the private sector is engaging in sustainable development activities in relation to business and industry that are deemed to be anything other than competitive. The examples suggest that the potentially anti-competitive aspects of business behaviour, such as social responsibility, increased reporting and accountability are in fact addressed by the private and not the public sector. The voluntary nature of this behaviour suggests that it is competitive in specific circumstances motivated by business risk and stakeholder views. The role that business and industry took in developing the outcomes from UNCED and Agenda 21, as described in Chapter Three, suggests that such activities would be anti-competitive since they were argued against in the preparations for UNCED. The examples demonstrate that a wider role for business and industry in sustainable

development than that perceived possible during preparations for UNCED and Agenda 21, is in fact possible without compromising competitiveness. The social responsibility element of the examples given demonstrates the strong influence that public perception can have on business competitiveness thus changing the focus of what is and is not competitive in an increasingly diverse and globalised market.

The examples from both public and private sectors indicate that there are a number of drivers and supporting mechanisms that can be employed by both sectors to influence more sustainable behaviour. The types of behaviour that are encouraged by specific drivers or support mechanisms can also in part be identified by analysis of the examples given. These findings facilitate the creation of a theoretical matrix that links specific drivers and support mechanisms to particular types of activity. Taking the drivers from both sectors together, they are as follows:

- Regulations
- Market mechanisms
- Business risk
- Stakeholders
- New market potential
- Global trends

The support mechanisms used by both sectors are as follows:

- Government leadership
- Partnerships
- Knowledge/ Information
- Staff resources

- Tools

The types of activities that those drivers and support mechanisms from each sector influence or support are as follows:

- Engaging partners
- Reporting
- Eco-efficiency
- Accountability
- Eco-efficient product lifecycle
- New products and market creation
- Social responsibility and
- Business leadership

The various influences of each driver or support on the types of action are visually represented in the matrix in Table 4.1 below. These features can create an example-based matrix of sustainable competitiveness since all the features of it are in the now extended realm of sustainable competitiveness. This matrix describes a wider definition of sustainable competitiveness than that presented previously in Chapter Two.

The wider definition of sustainable competitiveness described by the examples in this chapter still does not fully address sustainable development. A number of features of sustainable activity have not been evident in the examples given throughout the chapter. There appears to be little regard given to informing and encouraging decision-making for sustainable development, in particular by encouraging focussed engagement on specific topics. DuPont cites this aspect of behaviour. Corporate

visions and strategies and the role of government in influencing those is not mentioned in the examples although some of the business examples make reference to corporate strategies being focussed on sustainable development to a limited extent. The influence of long-term decision-making is contained within the business examples given, especially Volvo, where it is stated that resource efficiency measures are part of 19-year product lifecycle. Accountability, in relation to business activity and sustainable development is another area that extends from stakeholder engagement and corporate strategy development. Drawing from the conclusions in previous chapters, these types of activities cannot be disregarded in any study of sustainable development and competitiveness. Thus they will be incorporated into the matrix illustrated in Table 4.1 to create a theoretical matrix of influences and activities in sustainable competitiveness.

The matrix in Table 4.1 shows that the roles taken by public and private sector have the impact of delivering similar outcomes in most cases. All the outcomes instigated by the public sector also appear to have been instigated by the private sector albeit with different drivers and supports. It is not clear what impact the public sector has had on motivating the private sector in the examples given, whether in the cases described government has influenced stakeholders or business risk or created potential for new markets. This possible relationship needs to be explored in more depth with specific examples and is a key objective of the data collection chapters following.

	Tools	Staff Resources	Knowledge/ Information	Partnerships	Government Leadership	Global Trends	New Market Potential	Stakeholders	Business Risk	Market Mechanisms	Regulations
	SUPPORT									DRIVER	
Engaging Partners (General)											
Visions and Strategies											
Reporting											
Strategy into Action											
Eco Efficiency											
Focussed Engagement											
Accountability											
Eco Efficient Product Lifecycle											
New Products and Market Creation											
Social Responsibility											
Business Leadership											

CODE: RED: PUBLIC SECTOR INFLUENCE ON ACTIVITY
YELLOW: PRIVATE SECTOR INFLUENCE ON ACTIVITY
BLUE: NO IMPACT APPARENT IN EXAMPLES SELECTED

Table 4.1: Example Based Sustainable Competitiveness Matrix

The most popular areas where nearly all drivers and support mechanisms are having an impact are in eco-efficiency, eco-efficient product lifecycles and new products and market creation. That is, the areas being driven most are the areas that relate to

productivity and innovation: two of the main aspects of competitiveness as concluded in Chapter Two and which relate to the industrial ecology and innovation aspects of ecological modernisation. Reporting, corporate strategy, engagement with specific stakeholders and objectives, social responsibility and business leadership are all aspects of sustainable competitiveness that only the private sector is encouraging. Neither sector appears to have developed activity in relation to visions and strategies or accountability for sustainable development, from the examples explored.

There are issues of sustainability not addressed in the examples reviewed. The examples do not address equity issues. The role of innovation is very much encouraged by the public sector but with apparently little regard for its impact on increasing demand and consumption. Consumption itself is not mentioned at all and efforts to reduce resource use are focussed on increases in efficiency and materials substitution only for the most toxic substances or those related specifically to global warming. Thus although business strategies and actions can incorporate stakeholder engagement and long-term decision-making into a competitive business approach, the key issues of consumption and equity remain unresolved in this approach. The lack of ability to resolve this through business approaches means that governments must address these two issues if real progress towards sustainable development is to be achieved.

The table illustrates the differences between ecological modernisation and sustainable competitiveness. The issues not addressed by the public and private

sector examples given and those only addressed by the private sector all fall outwith mainstream ecological modernisation thinking, that is:

- developing business visions and strategies that are more sustainable
- reporting on business sustainability
- turning sustainability strategy into action
- focussed engagement on specific issues
- accountability
- social responsibility and
- business leadership.

While ecological modernisation seeks to incorporate some of these issues into the theory (such as developing business visions and strategies that are more sustainable and social responsibility) practical examples are so far suggesting this is not workable. Sustainable competitiveness, however, is a concept that seeks to encourage all these activities in business to make that business more sustainable by acknowledging that they can make certain businesses more competitive.

The examples presented in this chapter are not sufficiently in-depth to address issues such as the influence that one sector has on the other in this area. Nor do the examples give any real indication of how governments and businesses perceive their responsibilities in regard to sustainable development. The level of understanding of sustainable development by the organisations that are the subject of the examples presented appears to be high. However it is not clear at all whether this or any other aspect of business or government behaviour described so far is widespread across various business sectors or in a particular country. These

issues together with the details of specific examples and activities in both the public and private sectors will be the subjects of the data collection in the chapters following.

CHAPTER FIVE: SUSTAINABLE DEVELOPMENT AND COMPETITIVENESS IN THE PUBLIC SECTOR IN SCOTLAND

5.1 Introduction

The public sector, that is government and its local delivery agencies, has been identified in Agenda 21 as having a significant responsibility in implementing sustainable development as noted in Chapter Three. The public sector has a lead role in delivering national competitiveness the importance of which was outlined in Chapter Two. Given the dual remit it is reasonable to expect that the public sector will have taken some action to reconcile sustainable development and competitiveness. The objective of this chapter is to present an interpretation of how the public sector in Scotland seeks to deliver both sustainable development and competitiveness. The chapter will also present findings from interviews carried out with staff from the public sector in different areas of Scotland regarding specific aspects of delivery of sustainable development and competitiveness. In particular the research presented in this chapter seeks to clarify how the public sector in Scotland approaches sustainable development for the business and industry sector in Scotland since this sector has such a dominant role in competitiveness.

5.1.1 Chapter Outline

Following this introduction, which reiterates the methodology, the second section of the chapter describes the current governmental structures and agencies with responsibility for delivering both sustainable development and competitiveness in Scotland. The public policy framework that sets the context for delivery of sustainable development and competitiveness in Scotland is described in Section Three. This includes a brief description of the international context within which

Scotland operates. It also describes an overview of the relevant policies and the regulations, market mechanisms and voluntary agreements that are in place to effect those policies.

While the policy framework, regulations, market mechanisms and voluntary agreements set the basis for implementation of sustainable development and competitiveness, there is also the creation of factor conditions to be considered as discussed in Chapter Two. Local delivery agencies can have a strong influence on how factor conditions are created. Thus it is very important to understand how such agencies perceive government priorities and how they interpret sustainable development. The breadth of understanding, the ability to deliver actions and the types of actions undertaken to implement sustainable development are key issues in whether or not sustainable development and competitiveness can be reconciled. In addition the success or otherwise of the public sector in integrating its approach to sustainable development and competitiveness will be a test of commitment to sustainable development. Six particular themes were examined in gathering data for the case studies and findings on each of these are presented in Section 5.4[43].

RESEARCH THEMES
1. Government Priorities and Actions
2. Understanding of Sustainable Development in Practice
3. Ability to Deliver Sustainable Action
4./5.Form and Effectiveness of Actions (Environmental and Socio-Economic)
6. Integration of Sustainable Development and Competitiveness

Table 5.1: Research Themes

Particular examples of the good practice projects that the data-gathering interviews were based on are presented in boxed examples in Section 5.4.4. The themes, described in more detail throughout the chapter, are listed in Table 5.1 above. Section 5.4 notes the different interpretations of sustainable development within different parts of the public sector and relates this to the level of understanding of sustainable development. An overview of the types of actions employed is related to the range of possible actions described in Chapter Four. Finally a conclusion about the level of integration of sustainable development and competitiveness in the Scottish public sector is reached.

5.1.2 Methodology

The data presented in this chapter has been collected through a combination of reviews of policy statements and interviews with staff in a range of national and local public sector agencies. The literature review of policy statements was supported by critical reviews of the policies. The interviews were focussed on public sector delivery agencies that were engaged in good practice examples of delivery of sustainable competitiveness. Interviews were carried out with the relevant national agencies, i.e. the Scottish Executive, the Enterprise Network responsible for policy relating to business and industry and Forward Scotland, the main national organisation responsible for delivering sustainable development. Each of the agencies helped to identify locations of good practice for the local and project specific interviews. The examples of good practice were identified in areas that were

---

[43] Themes 4 and 5 have been combined in this section for analysis because the public sector interviews did not distinguish between the two types of approaches and the examples given had little in the way of socio-economic activity.

inside the boundary of Scottish Enterprise. The areas identified and the organisations interviewed were:

- Ayrshire, in particular a waste minimisation project on the Grangestone Industrial Estate in Girvan, interviewing South Ayrshire Council, Girvan Sustainable Communities Project and ACS Environmental Consultants
- Scottish Borders, in relation to the development of an environmental business complex at Tweed Horizons and Selkirk Riverside, interviewing Scottish Borders Enterprise
- Renfrewshire, specifically in relation to a sustainable site development at Drumcross Farm, interviewing Renfrewshire Enterprise and Renfrewshire Council
- Lanarkshire, which was involved in training and networks, interviewing Lanarkshire Enterprise.

During the course of establishing the framework for the interviews a number of themes emerged appropriate to:

- the role of government in reconciling sustainable development and competitiveness;
- the activities that each sector undertakes; and
- each organisation's approach towards sustainable development in the context of reconciling it with competitiveness.

These themes were refined during analysis of the interviews to create the research themes listed in Table 5.1 above. These research themes have been used to structure the analysis and the presentation of the data gathering interviews. Thus each sub-

section of section 5.4 following reflects the findings from each interview as well as the analysis of those findings. A full description of the methodology used is presented in the Introduction. The full list of projects and interviewee details are listed in Appendix One, with interview questions listed in Appendix Seven. Prior to analysing the interview data, Section 5.2 describes the main public sector organisations engaged in the sustainable development agenda as it relates to industrial competitiveness. Section 5.3 describes the policy framework that sets the operational context for these organisations.

5.2 Government and the Key Delivery Agencies

The UK Government governs Scotland, which has had a devolved parliament since 1997. That parliament and the associated civil service, The Scottish Executive (the Executive), deal with many governmental responsibilities. The UK government retains some responsibilities. The most relevant retained powers to this study are the retained powers of macro energy policy and fiscal instruments. All other responsibilities described in this thesis are that of the Scottish Parliament. The following two sub-sections describe the key organisations responsible for policy setting and implementation in Scotland for 1) sustainable development and 2) competitiveness.

5.2.1 Sustainable Development

In Scotland, the Parliament made the decision to prioritise activity on policy by introducing 11 cross cutting themes. These themes have been established to address the fact that these issues can be managed or implemented in some way by each department of the Executive and are not the specific responsibility of one particular

department for delivery. Small teams have been established to work within the Executive on each cross cutting theme. Their function is to promote their theme to each department and influence the way in which each department carries out its work. Sustainable development is perceived by the Executive as a cross cutting issue and its Sustainable Development Team (SDT) is responsible for promotion and influencing activities.

Different departments within the Scottish Executive have specific responsibilities in relation to policy and delivery of sustainable development. The Scottish Executive Environment and Rural Affairs Department (SEERAD) which has lead responsibility for delivering sustainable development in Scotland, and which manages the SDT, is also responsible for advising ministers on United Kingdom and European Community policy relating to agriculture, environmental issues and fisheries, and for the implementation of those policies in Scotland. The Development Department has lead responsibility for transport and planning. This department also acts as the lead department in implementing the social justice policies. The remit for the Enterprise and Lifelong Learning Department is to deliver policy on industry, economic development and all aspects of adult education and training. It also includes policy and implementation of policy relating to energy, where its responsibility has been devolved to the Scottish Parliament. Ministerial portfolios are not consistent with departmental structures. However the Cabinet Sub-Committee on Sustainable Development (CSCSS) has been established to identify priorities for sustainable development in Scotland, co-ordinate implementation of action and support cabinet colleagues in embedding sustainable development in their policies and programmes.

This group is chaired by the First Minister and supported by the SDT. An outline of the remit and membership of the group is listed in Appendix Four. Such a structure reinforces the need for the cross cutting theme teams and the importance of collaborative and concurrent activity in relation to various policy issues.

The Scottish Executive supports other agencies to assist in its role in delivering policy. In relation to sustainable development the Scottish Executive supports two major agencies: the Scottish Environment Protection Agency (SEPA) and Scottish Natural Heritage (SNH). It has charged each of these agencies with responsibility for considering sustainable development in delivering core functions. For SEPA core functions are specifically regulatory in relation to pollution control through monitoring, prosecution and charges under the regulations in force. For SNH the core functions of the organisation relate to protection of the natural heritage of Scotland. Clearly these two key agencies have a strong environmental bias in the work they are charged with delivering. In addition to the two key agencies described above, the Scottish Executive also grant aids an organisation with a specific remit to promote sustainable development. This organisation is called Forward Scotland and is a small charitable organisation that develops and delivers project based innovative approaches to sustainable development.

Some non-governmental organisations (NGOs) also have a key role in delivering sustainable development. Organisations such as WWF (the global environment network) Scotland and Friends of the Earth Scotland have both been effective in influencing policy relating to sustainable development. Friends of the Earth Scotland

in particular is one of only three external members on the Cabinet Sub Committee for a Sustainable Scotland (CSCSS).

Local authorities, with a remit to deliver Local Agenda 21, are another key group of organisations in relation to delivery of sustainable development. In Scotland, the 32 local authorities are all making efforts towards preparing and implementing Local Agenda 21 strategies with a view to fulfilling this remit.

5.2.2 Competitiveness

The Scottish Executive notes that in relation to competitiveness, it has to take the lead in building a new knowledge driven economy, which will allow Scotland to compete in the world market place. The Enterprise and Lifelong Learning Department (ELLD) is responsible for competitiveness. The ELLD supports Scottish Ministers in developing and promoting an environment that encourages business and enterprise to flourish in Scotland. This is done through providing grant assistance directly to a wide range of businesses.

The key external agencies that are charged with delivering competitiveness in Scotland are those that have the remit to support and develop business. These agencies are all part of the Enterprise Network and it is led through two key agencies and supported by local delivery agents. The two key agencies are Scottish Enterprise and Highlands and Islands Enterprise. The Scottish Executive's economic development and skills objectives are promoted in collaboration with Scottish Enterprise and Highlands and Islands Enterprise through a network of Local Enterprise Companies (LECs). LECs provide support to business start-ups, venture

capital and a range of business services. The LECs also deliver training programmes. ELLD works jointly with Scottish Enterprise to fund and staff Locate in Scotland, the single-door agency responsible for attracting internationally mobile investment projects to Scotland.

5.3 The Public Policy Framework

Both Europe and the UK guide the public policy framework for sustainable development in Scotland. The policy framework in Scotland is a complex mixture of policies which have been devised for Scotland and those which have been adopted to meet requirements at both European and UK levels. The following table summarises the key documents that set out the policy direction for Scotland both in relation to sustainable development and competitiveness.

Policy Framework		
	Sustainable Development	Competitiveness
Europe	1. Sustainable Development Strategy (2001) 2. 5th Environmental Action Programme (1993) 3. 6th Environmental Action Programme (2001)	1. Delors White Paper on Growth, Competition and Employment (1993)
UK	Sustainable Development Strategy (1999)	Competitiveness White Paper (1998)
Scotland	1. WET Strategy (unpublished) (2000) 2. AGSD/ ESDG (1999) 3. Checking for Change (2002) 4. Meeting the Needs (2002)	1. Framework for Economic Development in Scotland (2000) 2. A Smart Successful Scotland (2001)

Table 5.2: The Policy Framework

Note: this table lists the strategy documents dedicated to sustainable development and competitiveness. There are other policies that will impact upon their implementation.

The following section describes the main features of each document listed in Table 5.2 above relevant to this thesis as well as analysing the cross-topic linkages where they exist. The following subsections describes the policy frameworks of the European Union , the UK and Scotland in turn.

5.3.1 European Policy Framework

5.3.1.1 Sustainable Development Strategy

Europe's sustainable development strategy was agreed at Gothenburg in June 2001.

The document identifies six key threats to sustainable development:

- poverty and social exclusion;
- an ageing population;
- climate change;
- transport congestion and pollution;
- pressure on natural resources; and
- dangers to public health.

The first two of these have already been addressed by measures adopted at recent EC summits, says the strategy, and it therefore concentrates on the remaining four environmental issues. The Commission reiterates its commitment to market-based approaches and says that one of its challenges will be to send the right price signals to businesses and individuals by removing subsidies which encourage wasteful use of natural resources, and internalise the environmental costs of pollution. The strategy also puts emphasis on civic involvement in the strategy and states that it expects European citizens and business to become much more engaged with policy by adopting a consistent approach to engagement. The strategy makes clear statements

regarding its integration into other policy areas and in its intention to make sustainable development part of the core concern of all EC policies (ENDS, 2001a).

5.3.1.2 5th Environmental Action Programme

Europe has shown its commitment to developing environmental policy through its publication and implementation of a series of Environmental Action Programmes. The changing attitudes to industrial environmental policy can be witnessed through the progress made in each programme. The Fifth Environmental Action Programme "Towards Sustainability" (5EAP) which operated until 2001 argued that industry could be part of the solution to environmental problems and that economic development and environmental protection need not be mutually exclusive policy ambitions (CEC, 1993). In order to show the potential opportunities that environmental protection could afford business, the 5EAP suggested that policy makers work with industry to set policy that aimed to improve the management and control of production processes. The 5EAP made waste minimisation the focus of activity rather than simply control of emissions, which had been the subject of earlier programmes. This approach is starting to demonstrate an ecological modernisation approach.

5.3.1.3 6th Environmental Action Programme

The Sixth Environmental Action Programme (6EAP) was introduced early in 2001 and will operate until 2010. The main goal of this programme is decoupling economic growth from environmental damage, largely through improvements to eco-efficiency. This programme unlike its predecessors is weak on specific targets or timetables for achieving objectives. However the European Union has resolved to prepare more specific thematic papers during the period of implementation to address

these issues. Another notable feature of the programme is the shift of emphasis away from legislation. Legislation will still be produced but legislative style will change to one with less reliance on prescriptive standards and more on defining outcomes. The style will increase the use of regulatory incentives for companies to perform well, and a shift to "co-regulation" - establishing a regulatory framework and policy objectives, but leaving the practical implementation measures to be defined by industry in a consensual manner (ENDS, 2001a). The language of the 6EAP is also the language of "promoting", "encouraging" and "supporting" action by business. This programme is taking a much stronger approach to ecological modernisation than its predecessors.

The 6EAP identifies five priorities for strategic direction. One of these is about improving the way the business sector works on environmental issues. Measures suggested to develop this area include:

- New partnerships with business,
- Measures to "encourage" more companies to publish independently verified environmental or sustainable development reports,
- Encouragement of Member States to streamline their permitting procedures for firms registered under the EMAS environmental management standard,
- The development of national, but harmonised, company environmental performance reward systems that identify and reward the good performers,
- Lighter permitting and reporting requirements,

- Development of a "compliance assistance" programme targeted at smaller businesses, and to "encourage" voluntary environmental agreements and commitments

The Commission may also break new ground with a voluntary initiative to encourage the financial sector to harmonise its practices on environmental reports, loans and green investment funds.

The priority themes for the 6EAP are:

- Climate; specifically that the aim should be a global emission reduction of 20-40% below 1990 levels by 2020. While a thematic paper will be produced to set clear targets one main area that the 6EAP states it will deliver is to introduce an EC emissions trading scheme for carbon dioxide by 2005.
- Environment and health; the overarching objective in this area is to ensure that levels of man-made contaminants do not give rise to significant impacts on, or risks to, human health. Again a thematic paper will introduce more detailed proposals.
- Resources and waste; the objectives here are to ensure that resource consumption and its impacts "do not exceed the carrying capacity of the environment and to achieve a decoupling of resource use from economic growth through significantly improved resource efficiency, dematerialisation of the economy and waste prevention. For clarity waste prevention means reductions in both its quantity and hazardousness and these will be key features of the EC's products and chemicals policies.

- Biodiversity; initiatives planned in this field include a thematic strategy on soil protection, and a strategy for protecting the marine environment from pollution, waste dumping, development, fishing and other pressures (ENDS, 2001a).

The European framework for sustainable development is comprehensive in its approach to eco-efficiency and it sends a strong leadership message by suggesting that market mechanisms will be heavily applied to meet these objectives. Equally there are very clear messages about priority themes and the role of business, to undertake more voluntary initiatives in environmental management and become more self-regulating. However the polices set out above have a weak approach to the issue of consumption which is a key feature of environmental degradation in wealthy countries. Nor are the social responsibility aspects of sustainable development in the business sector addressed through the policies that are outlined above with the exception of the objective of increased civic engagement in policy making for the European Union that is set out in the Sustainable Development Strategy. The sustainable development strategy links to other strategies such as social exclusion strategy. Two new European policy papers that are currently being developed may go some way to addressing these two key areas. The first is the Integrated Product Policy (IPP). However this policy has been criticised for simply extending the technical approach to environmental issues by addressing consumption as an issue about product development and technology as well closed loop systems. This approach fails to address key issues about consumer choice and behaviour (Murphy, 2000). The second paper is about Corporate Social Responsibility and it is at a very early stage of consultation.

5.1.3.4 Growth, Competitiveness and Employment

Competitiveness is a core goal of the European Union and one of the main reasons for its existence. The EU White Paper on "Growth, Competitiveness and Employment: The Challenges and Ways Forward in the 21st Century" published in 1993 is a key document in determining European policy on competitiveness. This paper, which was developed to consider how the EU might stimulate growth and reduce unemployment, was consistent with 5EAP. The paper recognises the importance of 5EAP stating that it is possible to make the economic-ecological relationship a positive one, particularly in the creation of a new clean technology base. The White Paper states:

> "*This new clean technology is likely also to generate, apart from a substantially improved environment, considerable secondary benefits for the Community...in competitiveness terms. The Community would improve the overall strength of the economy through optimal use of its resources and the prevention of costly clean-up operations, while a first mover advantage can be exploited: the latter element is not to be underestimated as the new technology is not only a necessity in the industrial world but also in the Newly Industrialised Countries and the Less Developed Countries."(CEC, 1993)*

The consistency between the 5EAP and the White Paper on Growth, Competitiveness and Employment demonstrates that in Europe the policy messages from each discipline are reflected in other policy statements. It further demonstrates that at the European level there is recognition of the potential for sound environmental management to support competitive business practice but there is no indication in these papers that the role of sound social responsibility in business has been recognised.

5.3.1.5 Sustaining the Commitments, Increasing the Pace

The European Union continues its strong commitment to economic growth and demonstrates this through its annual reporting on competitiveness (CEC, 2001b). The

economy must realise high growth in productivity. For this reason, understanding the forces supporting technological progress and productivity growth is crucial for guiding policy towards achieving the ultimate objective of economic policy. Modern theories of economic growth point to innovation as a critical determinant of productivity growth. Priority areas of development for European competitiveness are the development and increased use of information and communication technologies (ICT) and biotechnology (CEC, 2001b).

Consistent with its previous approaches the new European agenda for competitiveness takes sustainable development into account. The modernisation of enterprise policy is central to the goal of becoming the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion within the present decade (CEC, 2001a).

5.3.2 UK Policy Framework

5.3.2.1 Sustainable Development Strategy

The UK Government has twice produced a strategy on sustainable development. The first in 1994 was intended to stimulate a favourable climate for Departments to begin environmental appraisals of their policies, supported by a new Department of the Environment (DoE) guide. But five years on, the Environmental Audit Committee revealed in May 1999 that a request to Departments for copies of recent environmental appraisals had yielded none (ENDS, 1999).

The second UK sustainable development strategy was published in 1999. However this document has been widely criticised for being a framework and not a strategy. There is nothing in the document to give an indication of what the Government is aiming for and no clear sense of priorities. A set of 150 sustainable development indicators supports the strategy with 15 of these reaching "headline" status. The only commitment from the government here is that for headline indicators only, the Government would like to see these indicators moving in the right direction or, where satisfactory, to prevent a reversal. There are no set targets nor any timescales or deadlines within which such progress can be monitored (ENDS, 1999).

The 1999 strategy does describe some limited analysis on the projections of environmental pressures in relation to energy consumption if growth continues at the present rate. It does not however set any priority or target to support work intended to mitigate this situation. For resources other than energy the position is weaker still. Here the scale of the efficiency challenge is said to "vary". The pressing need to improve resource efficiency is acknowledged, reflecting part of the European policy, but there is no substantive analysis of what this may mean for individual sectors of the economy and no targets or indicators. The Environmental Audit Committee stated that the strategy appeared to be deprioritising the environment. There was no recognition that a separate environmental strategy that linked to social and economic strategies, as in Europe, might address this imbalance.

The UK utilises a number of environmental regulations, voluntary agreements and market mechanisms to implement its policy on sustainable development. Three key

instruments agreed by the European Union under the 5EAP were the Integrated Pollution Prevention Control Directive (IPPC), the Producer Responsibility Regulations and the Eco-Management and Audit Scheme (EMAS). The IPPC was weakened during negotiations leaving the option open to Member States as to whether they require Best Available Technologies (BAT) standards. The UK did not take up this option fearing it to be anti-competitive (Murphy, 2000). The Producer Responsibility Regulations are largely aimed at minimising waste and the first part of the regulations to be implemented in the UK was the Producer Responsibility (Packaging Waste) Regulations 1997. The main voluntary agreement implemented in the UK is EMAS; an initiative aimed at improving management systems for economic and environmental gain. Take up of EMAS in the UK is less than 100 companies set against the 3.5million companies thought to be operating but take-up of a similar international standard ISO 14000 is slightly higher. Michael Meacher, UK Minister for the Environment, noted that "we have hardly scratched the surface" in regard to this initiative (Croners, 2001). In terms of market mechanisms, the UK has implemented the Climate Change Levy and the Landfill Tax to support its polices on climate change and waste minimisation.

In relation to business, the approach set out in the strategy is to use a range of measures to promote:

- Continuous improvements in performance and existence of good practice
- Designing products so that they can be easily upgraded and recycled
- New kinds of products
- Meeting consumer need through services rather than goods

The priorities outlined above are very much in line with measures that would create sustainable business practice. They make the link to innovation without being explicit about it and there is also a strong emphasis on reducing the environmental impact of business operations. This latter feature particularly is in line with the European objective of decoupling environment from growth but it fails to address the issue of levels of consumption. The sectoral sustainability strategies described following show a strong voluntary approach, again very much in line with the European strategic priorities.

One of the key measures suggested by the Government to achieve greater sustainability in the business and industry sector is the preparation of sectoral sustainability strategies. The original aim had been to have at least six of these strategies in place by 1998. Repeated delays have meant that the target was changed to the end of 2000 (ENDS, 1999). The target for six sectoral strategies has not been met. This is despite the fact that around 20 sectors signalled an interest in taking part in the scheme when it was first suggested in 1998. The first strategies finally emerged in March 2000 from the motor manufacturing and aluminium sectors. A further two strategies have been prepared by the chemical industry in November 2000, and the offshore oil and gas industry in May 2001. A fifth strategy from the retailing sector was published in November 2001 (ENDS, 2001b).

Problems with progress on this issue relate to an apparent lack of commitment from the Government. In addition to poor commitment the Government also failed to set

any sanctions against sectors not taking up the challenge. There were no plans to regulate to enforce compliance if voluntary targets were not met. Other voluntary agreements, such as the Government's initiative on climate change levy have been successful because they offered reductions in the levy if certain targets were met. Industry's poor response to appeals from Government to move the agenda forward, regarding the sectoral strategies has undermined its argument to be allowed to act voluntarily. The Government's failure to back up its appeals with regulation - despite repeatedly threatening to do so - has given business little incentive to act (ENDS, 2001b).

Another of the key measures suggested was corporate reporting. In 1998, Michael Meacher, the UK Minister for the Environment, threatened legislation to promote reporting if voluntary actions failed. However the Government has not stated any plans to legislate. Instead it planned to look to the top 350 companies in the UK to report to common standards set out in the guidance by the end of 2001. The Government then plans to extend the reporting to the 7,000 businesses that have more than 250 employees (ENDS, 1999). At the end of 2001 in the UK 114 companies have prepared social and ethical reports and 203 companies have prepared environmental reports[44].

To summarise, the UK government's strategy on sustainable development is weak setting no targets and offering no specific areas for priority action. A promising

---

[44] For more information on this see http://cei.sund.ac.uk/core.htm and http://cei.sund.ac.uk/ethsocial/index.htm

approach to engaging with businesses by setting goals for preparation of sectoral strategies and reporting has failed due to a lack of commitment from government and a failure of government to establish legislation or incentives which would encourage the desired behaviour. The UK strategy is compatible with the EU strategy regarding voluntary agreements and market mechanisms, and consequently its ecological modernisation based approach, but it is much less explicit on themes making it's role in leadership less clear than that in Europe.

5.3.2.2 Competitiveness

The core of the Government's strategy relating to competitiveness is improving productivity performance. The Government set out its comprehensive strategy for meeting the productivity challenge in "Productivity in the UK: The Evidence and the Government's Approach", which was published alongside the November 2000 Pre-Budget Report (UK Government, 2000). This paper notes that enterprise and innovation, strong competition, investment by private firms and in public infrastructure as well as improvements to skills are all key features in improving productivity. The Government has further set out its policy for enterprise and innovation in two White Papers published during 2001 and in the consultation document "Increasing Innovation", which was published alongside Budget 2001. Despite the DTI's involvement in developing a strategy for sustainable development, none of its policies actually make reference to sustainable development, except for one reference to sustainable energy in the innovation paper, which notes that new technologies need to be commercialised.

In contrast the UK Treasury does make the connection between long term economic growth and sustainable development. The Treasury explicitly promotes the use of market mechanisms for sustainable development, very much in line with European policy. The Treasury's 1998 report states:

> *"Economic growth cannot be considered in isolation from other aspects of development. In particular, consideration needs to be given to environmental factors to ensure that economic growth is sustainable."* (HM Treasury (UK), 1998, p 7)

The report further makes the point that an increase in the rate of growth of 0.5% per year would add over £120bn to the level of the national economy in 20 years time presumably thus making more money available for environmental protection and social justice and thus improving sustainable development. The specific measures stated in the report that will promote this sustainable growth are:

- Ensuring policy decisions take account of environmental costs and benefits
- Making greater use of economic instruments for the environment alongside regulations and voluntary agreements
- Encouraging more environmentally friendly transport and reducing greenhouse gas emissions through tax and duty charges and
- Promoting energy efficiency and renewable energy sources.

It is also noted that work on environmental accounts and indicators will help to promote growth which is more environmentally sustainable. Other aspects for achieving high and stable levels of economic growth and employment that are prioritised by HM Treasury are economic stability, encouraging work and raising productivity. This latter priority should be achieved through improving education and training, capital investment, open and competitive markets, stimulating innovation and research and development (HM Treasury (UK), 1998).

5.3.3 Scottish Policy Framework

5.3.3.1 The Awareness Raising Stage

From 1990 to 1999 the Scottish Office and then the Scottish Executive predominantly promoted the concept of sustainable development without using a concise definition. Broadly the Executive did this by hosting conferences, making speeches and putting the words "sustainable development" into key documents. No guidance on how to deliver sustainable development was prepared because the government did not want to be prescriptive in how sustainable development should be delivered. The key concern here was that a prescriptive approach might have stifled innovation. The Executive instead tried to influence and recognise good practice. A number of mechanisms were used to do this. The development of a strategy on sustainable development for Scotland in 2000 was intended to move this process onto a second stage.

From 1990 to 1999, the Scottish Executive promoted sustainable development through five activities. These are the Advisory Group on Sustainable Development (AGSD), Local Agenda 21, the Education for Sustainable Development Group (ESDG), consultations and Forward Scotland. Also the Scottish Office and then the Scottish Executive used promotion events to establish widespread understanding of the concept of sustainable development.

5.3.3.2 Advisory Group on Sustainable Development

The Advisory Group on Sustainable Development (AGSD) was established to offer advice to the Scottish Office and then the Scottish Executive on sustainable

development from 1994 until 1999. The group had a remit to advise the Secretary of State for Scotland on policy issues and practical challenges for Scotland as a consequence of adopting the principles of sustainable development as well as measures to achieve closer integration of environmental issues in the policies and practices of both the private and public sectors across Scotland. The group's final report was a ten-point action plan for sustainable development in Scotland (AGSD, 1999). The top priority was leadership and the lack of public indication of interest in sustainable development by the First Minister is an indication of the lack of commitment to pursuing this recommendation (Birley, 2001). The list of action points recommended by the AGSD is in Appendix Five. However despite this information being made available to the Scottish Executive and the Parliament, little progress has been made in working either to formalise a strategy taking these points into account or to deliver outcomes relating to these action points. More recently than that report, Scotland's First Minister has made an inaugural speech on sustainable development on 18th February 2002 indicating an increasing level of commitment to its implementation. This speech highlighted the priorities for Scotland of:

- Environmental justice, with a specific reference to closing the gaps on inequality in environment for those people who have the least
- Reductions in resource use
- Reductions in waste arising and increases in waste recycled
- Reduce demands on energy from non-renewable resources
- Reduce the need for travel.

These priorities reflect The Scottish Executive's Waste, Energy, Travel (W-E-T) focussed strategy but put more emphasis on the relationship between W-E-T and social justice and economic growth (Scottish Executive, 2002).

5.3.3.3 Local Agenda 21

The Prime Minister, Tony Blair, gave each local authority in the UK a deadline of the end of 2001 to complete preparation of Local Agenda 21 (LA21) strategies. Much of the activity by local authorities regarding LA21 has been in relation to preparation of strategies. LA21 strategies have not focussed on business activity except where local waste minimisation programmes are in progress (CoSLA, 2000).

5.3.3.4 Education for Sustainable Development Group

This group's remit was to review and report on education for sustainable development with particular regard to promoting a strategic approach and assessing its effectiveness. This group completed its programme of work in 1999 and published its final report and recommendations (Appendix Six) at that time reporting on recommended actions for the government to promote and educate on sustainable development. The vision that this group identified

> "*Included encouraging the skills and providing the resources for people to play a full and effective part in the democratic process of a Scotland in transformation, economically, culturally and environmentally*" (ESDG, 1999).

Specifically the report noted that business needs leaders and employees capable of imaginative long-term planning. However the government has been criticised for disengaging with the messages set by the ESDG's ten-point action plan. It is stated that the process of making Scotland more sustainable cannot start without raising awareness as learning is such an important part of progressing (Birley, 2001).

5.3.3.5 Consultation

The government in Scotland consults on a wide range of issues and promotes the message about sustainable development in doing so. Certain consultations are specific to sustainable development such as that during 1999 on Scotland's strategic perspective on sustainable development. Other consultations are within a specific field such as those on the Scottish waste strategy and the Scottish transport strategy. No consultations specific to business or the UK sectoral strategies for business have been undertaken in Scotland.

5.3.3.6 Forward Scotland

Forward Scotland is a charitable company established by the Scottish Office in 1996 and funded by what has become the Scottish Executive. This organisation has a remit to develop and promote practical examples of sustainable development. Such work involves working closely with all sectors to develop innovative solutions to problems that are currently not being addressed in a sustainable manner. Forward Scotland has been successful in developing particular initiatives with the business sector such as the Landfill Tax Credit Scheme; the Jobs in the Environment Programme, resource efficiency projects and some community based work. Where this demonstrates interest by the business sector in some aspects of sustainable development, the organisation is not sufficiently resourced to turn these demonstration projects into national schemes and no other organisation is under obligation to do this. However some possible nation-wide replication of a waste

minimisation scheme led by East of Scotland Water may be undertaken nationally through partnership working with Forward Scotland[45].

5.3.3.7 The W-E-T Strategy

The Scottish strategy for sustainable development has existed in draft form since August 2000 but it has never been published. The Scottish Parliament was established in 1997 and since then it has governed over the devolved functions concerning Scotland. During this time it became clear that the previously co-operative relationship with the UK Government over sustainable development issues had become a competitive one. A commitment to produce a separate strategy for Scotland was made by John Sewel, Minister for the Environment in Scotland following criticism of the earlier position statement "Down to Earth" (Scottish Executive, 1999).

The draft strategy that was prepared for Scotland is limited in its scope. The draft states that the UK deals with non-devolved issues, which includes macro energy policy, and that the strategy itself is not a "fully fleshed out framework of ideas" (Scottish Executive, 2000a). It is therefore not surprising to learn that the focus of the strategy is limited to three priority themes: waste, energy and travel. The document raises many questions about how these issues are currently unsustainable and suggests ideas for making them more sustainable but there is no clear lead on a vision for Scotland or targets and milestones to support progress towards any such

---

[45] For more information about Forward Scotland and its specific projects see http://www.forward-scotland.org.uk

vision. The content of the strategy has been criticised by the Chairman of the UK Sustainable Development Commission, Jonathon Porritt. The priority themes could be said to reflect the priority themes of the EU sustainable development strategy except that danger to public health is not mentioned. Equally there is nothing in any of the work carried out by the Scottish Office or the Scottish Executive that links this policy work to that of other key areas notably social justice and economic development. Nor is there any intention to produce a complementary environment strategy.

Unlike the UK Government, the Scottish Executive has not backed up its framework on sustainable development with indicators of any kind. It has however been making efforts to agree a set of indicators to reflect the priorities of the framework. These indicators have been going through a consultation process since February 2000 and have only just been finalised early in 2002 (Scottish Executive, 2002). Much of the delay has been a reaction to the heavy criticism the indicators work has received on account of its being both limited (to W-E-T topics) and incompatible with other previously agreed data sets, such as the UK indicators set with which comparisons will be necessary (Birley, 2001). The final set of indicators includes reference to the economy, social justice and biodiversity but not all the indicators listed are capable of being properly measured at this stage and nor are targets set for all the indicators (Scottish Executive, 2002). Although the Scottish Executive strategy retains a focus on resource use, it is weak in encouraging either efficiency or conservation. Partly owing to its limited powers the Executive fails to advocate mechanisms, such as

market mechanisms for encouraging these activities. It is therefore barely compatible with an ecological modernisation approach.

5.3.3.8 Competitiveness

In contrast to strategy for sustainable development, the Scottish Executive has produced a clear and well-received strategy for economic development in Scotland, *The Framework for Economic Development in Scotland* (FEDS) (Scottish Executive, 2000b). The document sets out a vision for Scottish economic development, the key outcomes the Executive wishes to see delivered and the list of enabling factors that it considers will lead to those outcomes. The outcomes that the strategy has set as objectives are:

- Securing economic growth through increasing international competitiveness
- Regional development
- Social integration
- Sustainability

The enabling factors identified by the Executive are:

- Stable macroeconomic background
- Supportive economic infrastructure
- Dynamic competitiveness in Scottish enterprises
- Securing social, regional and environmental objectives

In contrast to the sustainable development strategy this strategy links economic development to sustainability and social and environmental objectives (Scottish Executive, 2000b).

The Enterprise Networks, the delivery agencies for economic development in Scotland, responded to the FEDS by producing a statement on the ambitions of the Enterprise Networks. This statement, *A Smart Successful Scotland*, established key priority areas in productivity, entrepreneurship, skills and digital connections and enhancing the ICT sector. This document too notes that it will be important for economic development strategies to take into account the Executive's cross cutting strategy on sustainable development. However, there is no further detail as to how that will impact on the strategies to be developed by particular enterprise networks more locally. There is therefore the possibility that such statements are merely rhetoric as again no targets or objectives with specific reference to sustainable development are present in the documents that set the policy context for competitiveness and economic development in Scotland (Scottish Executive, 2001).

The perspective of Scottish Enterprise and some of the LECs was researched through the data collection interviews and the findings from these interviews are given in the next section.

5.4 Research Themes

The following research themes emerged from setting the parameters for the interviews in both public and private sectors and were refined during the analysis of the interviews. They offer a way to interpret understanding of how sustainable development is perceived and implemented by some key delivery agencies in Scotland's public sector. The research themes were explored through specific interviews forming the main data collection method for this chapter and these

interviews were conducted as per the methodology described in the Introduction to this chapter and more fully in the Introduction to this thesis. A standard set of questions was prepared for the interviews based on the conclusions reached in the literature review to ensure consistency and questions are listed in Appendix Seven. The interview data is analysed solely in respect of the possible reconciliation between sustainable development and competitiveness and focuses on efforts applied by the public sector in relation to Scotland's business community.

Each of the following subsections describes the objectives of the interview questions in relation to the research theme before describing the findings and the analysis of all the interviews for the public sector in relation to each theme. Thus the findings from each interview are interwoven throughout the analysis of each theme with specific case information presented in the case study boxes that complements the fourth and fifth research themes "*Form and Effectiveness of Actions*". This case study information is the focus of the interviews as it is the good practice that was instrumental in selecting the interviewees. The other research themes (1,2,3 and 6) and the interview questions explore the context and motivations for the implementation of that good practice.

5.4.1 Theme 1: Government Priorities and Actions

Government priorities set the framework for all public sector agency priorities. Resource allocation, specific direction and legislation or perceived threat of legislation each affects the extent to which public sector agencies will act on those priorities. Clarity of purpose and clarity on the actions that can be taken to achieve that purpose are essential elements of successful delivery of any public sector

activity. The extent to which government communicates its priorities and acts to reinforce those will have a significant influence on the effectiveness of public sector agencies with a responsibility to deliver sustainable development.

5.4.1.1 Aspects of Research Interest

Government relies on public sector agencies to deliver its priorities and so the interpretation of those priorities by agencies will have a significant effect on how effectively these priorities get delivered. It is therefore of interest to understand how public sector agencies interpret, prioritise and apply government priorities in their work. It is also of interest to understand how clearly the public sector agencies are able to interpret the government's view on sustainable development and whether this clarity is sufficient to enable delivery. Any monitoring programmes or agreed targets will offer insight into the clarity of government priorities.

5.4.1.2 Research Findings and Analysis

A lack of clear vision from government has prevented any clarity on the government's vision for sustainable development being communicated to key delivery agencies such as the Enterprise Network in relation to the business and industry sector. A responsibility for sustainable development has been communicated to the Enterprise Network by the government but that responsibility has not been communicated in such a way as to instil sufficient responsibility for the subject to be mainstreamed into all activities. An annual letter stating the policy direction for the Enterprise Network has in the last few years started to mention sustainable development as a role for the Network. In 2001 a more focussed approach has been taken in that government has prepared the Framework for Economic Development in Scotland (FEDS) noting sustainable development as a priority (Scottish Executive,

2001b). However no targets or milestones have been set, no monitoring programme established nor any specific guidance as to how sustainable development might be integrated into the main work of the Enterprise Network.

While government has made efforts to communicate sustainable development as a priority through some policy directions, such as that given to the Enterprise Network, there is much unrealised potential for setting a clear vision and demonstrating the integration of policy initiatives. Government direction on sustainable development is through reference to sustainable development as an aspiration without direction, detail or targets.

Sustainable development has not been resourced to the same extent as other policy initiatives and as such delivery agencies perceive its status as a low priority for the government. Other drivers to motivate developments in this area such as more frequent communication from government, additional resource allocations, legislation or fiscal incentives have not been committed to or even suggested. This too weakens the priority attached to sustainable development.

No efforts have been made to produce guidance notes to facilitate better understanding on sustainable development in practice. The only efforts made to bring a practical perspective to this policy initiative are demonstration projects that are limited in scope and under resourced to communicate this message as widely as need be.

5.4.2 Theme 2: Understanding of Sustainable Development in Practice

Sustainable development needs to be implemented through a wide range of organisations and thus involves a wide range of people with different skills and disciplines. With so many people involved in delivering the vision of sustainable development it would appear to be important that a common understanding of sustainable development, and how it can be practically achieved, is reached. For public sector officers working to deliver sustainable development, there is a strong belief that the first priority is to increase understanding of sustainable development amongst key decision-makers. This is on the basis that they are making non-sustainable decisions because they neither appreciate the nature of, nor the opportunities afforded by sustainable development (CoSLA, 2000).

A core feature of the Scottish Executive's approach has been to try to generate widespread understanding of sustainable development without being prescriptive about its interpretation. This was delivered through a range of leaflets, seminars and demonstration projects. In addition to this, there has been increasing pressure from some major public sector funders, such as the European Union, for funding applicants to present their applications with a view to their effect on sustainable development. This has raised the profile of sustainable development amongst some public sector workers and increased the need for improved understanding of it.

5.4.2.1 Aspect of Research Interest

To gain insight into the effectiveness of the government's approach towards sustainable development, it is of interest to seek clarity on the extent and the level of understanding of sustainable development in the public sector. It is also of interest to gain insight into the extent that the level of understanding reflects the roles and responsibilities of people involved in implementing sustainable development programmes.

5.4.2.2 Research Findings and Analysis

Many of the officers interviewed could offer textbook definitions of sustainable development. Some who had been involved in specific projects were more able to offer an intuitive interpretation of sustainable development that took local conditions into account. The balance between social, economic and environmental pressures was the thing that people found the most difficult to achieve in interpreting sustainable development in practical terms.

The government's efforts in increasing understanding of sustainable development are largely aimed at explaining the concept of sustainable development. The lack of clarity about the direction and objectives for sustainable development in Scotland could explain the lack of demonstrations or clear guidelines as to how that vision can be achieved. Consequently there is no clear and resonant message about the importance of sustainable development to the target audience. The messages about its importance are global, and not specific to Scotland or even more local areas. Consequently there is a failure to generate interest in the subject amongst those that are not already enthusiasts. Widespread understanding will not be achieved until

there is widespread acknowledgement of the reasons for concern at a level that is resonant with people that the government wishes to inform.

The messages that the government does communicate regarding sustainable development send a strong environmental message resulting in the perception that sustainable development is an environmental issue. This is reflected in the way in which agencies allocate responsibility for sustainable development. The responsibilities are frequently allocated to either staff with environmental, planning or occasionally general policy related roles. Once a responsibility for sustainable development has been allocated to an officer with an environmental bias, due to professional expertise, past experience or existing organisational goals, their further interpretation without clear guidance to the contrary tends to reflect that bias.

The allocation of responsibility of sustainable development to one officer within an organisation further contributes to a lack of widespread understanding of the issue and its practical application. The best understanding of sustainable development was evident from officers who had worked directly on sustainable development projects. If responsibility within organisations were spread more widely on a wider range of projects the understanding would filter through the organisation more quickly. This single officer allocation of responsibility, without firm guidelines, also contributes to difficulties in proper interpretation of sustainable development. Its multidisciplinary nature means that socio-economic as well as environmental issues need to be taken into consideration. The complexity of the issues means that multidisciplinary teams would be more effective than leaving the role to one officer in considering project

design and implementation. Currently efforts to embed sustainable development into the mainstream activities of these organisations are rare. Consequently a spread of understanding of sustainable development is not facilitated.

5.4.3 Theme 3: Ability to Deliver Sustainable Action

Sustainable development is the type of activity that requires a multi disciplinary approach to working to seek imaginative programmes of action outwith traditional single approach solutions. It also requires a team approach within organisations and a partnership approach engaging a range of organisations in order to best utilise the different skills and knowledge that exist within them. Sustainable development is not a clearly defined project that can be dealt with in isolation from other organisational activities. Sustainable development implementation cannot neatly be allocated to one agency and so it will have to be delivered by a hybrid of agencies, working to a common vision. Good management principles suggest that when a number of organisations are working together to deliver a common vision, it is extremely important that they each have a clear understanding of their roles and responsibilities in relation to delivery of that vision.

Sustainable development also requires innovation and changes in the way the things are currently done. Organisational culture determines whether or not innovation is encouraged and whether or not such innovations become realised. To some extent organisational structures and the way they are managed determine the culture of the organisation thus having a strong influence on its ability to be innovative, to encourage multi disciplinary team working and realise the potential of its innovations.

5.4.3.1 Aspects of Research Interest

Despite the lack of clarity from the government, it is important to establish whether or not a clear vision of sustainable development has been understood and adopted by agencies that have a role in delivering sustainable development. The extent to which agencies, particularly those concerned with the business sector, have set themselves a clear role in sustainable development is a reflection of a clear and accepted responsibility. The clarity of the role will also be demonstrated by the extent to which targets and milestones are set and the approach taken to management of sustainable development initiatives.

The need for a culture of innovation, multi disciplinary team working and a broad acknowledgement of responsibility for sustainable development will be affected by the structures and management of the agencies delivering sustainable development activities. It is of interest to understand the extent to which innovation in working practice is encouraged. It is also important to gain insight into how multi disciplinary working is facilitated and whether or not there is understanding amongst all officers of the contributions they can make to sustainable development.

5.4.3.2 Research Findings and Analysis

Section 5.4.1.2 noted that government had not set clear direction on sustainable development for public sector agencies responsible for working with the business sector. Neither has the Enterprise Network, as the main public sector delivery agency working with the business sector, established any specific targets, milestones or monitoring procedures relating to sustainable development.

Multi disciplinary team working in relation to sustainable development does not take place in the Enterprise Network. The way in which sustainable development activities are financed has a significant impact on these features of project development and delivery. As a result of the lack of leadership committing the Enterprise Network to deliver specific goals and targets relating to sustainable development, many projects that are delivered with this focus are the product of additional resources, or grant funding from sources other than the organisation's core budget. This means of funding prevents core organisational resources, such as staff, from being widely used to support, develop or implement the projects. A result of this is the lack of multi-disciplinary approach and team working on these projects.

The public sector financing regime also creates problems in encouraging innovation. Owing to the need for public sector finances to be highly accountable, resourcing decisions often are highly prescriptive so that organisational goals and plans are rigid in order to meet the requirement of accountability. Such rigidity is a hindrance to innovation and perceptions of such hindrances appear to have an equally damaging effect in terms of stifling innovation. The perception that sustainable development is neither a core function nor a spending priority leads to the lack of innovation specifically in this area of work where it is fundamental to successful implementation of sustainable development.

The financing of sustainable development activities and the resultant lack of multi-disciplinary team working and innovation perpetuate the situation that sustainable development projects are additional grant funded projects that do not have a place in

mainstream activity of the Enterprise Network. A lack of commitment to change the way such activities are financed and resourced exists and will further perpetuate this situation.

5.4.4 Themes 4/5: Form and Effectiveness of Activities and Actions (Environmental and Socio-Economic)

The policies set by government have established a non-prescriptive framework for sustainable development. There are very limited regulations, guidelines or dedicated resources to implement sustainable development. There is, therefore, a high degree of flexibility in the way that agencies can and do implement activities to deliver sustainable development. In determining the actual role of government in delivering sustainable development, it is important to understand what mechanisms and activities agencies are employing in this role. To understand whether or not government is making a difference in reconciling sustainable development and competitiveness it is important to understand not only what is being proposed but also what is being done. It is therefore an essential part of the analysis to assess the effectiveness of the actions that public sector agencies are undertaking.

5.4.4.1 Aspect of Research Interest

The many ways in which public agencies can encourage or support sustainable development are investigated here by examining examples of good practice. The interview selection process identified the examples of good practice in sustainable development applied in Scotland through the public sector. Their effectiveness is a measure of the extent to which they contributed to sustainable development, the results in terms of a culture change in beneficiaries of the projects or programmes

and the recognition of the benefits through mainstreaming activity in the public sector agencies. Mainstreaming good practice demonstrates an effective programme in terms of its practicality for implementation, its successful outcomes and the commitment of the organisation to implement it more widely.

5.4.4.2 Research Findings and Analysis

There are several activities that government led agencies, such as the Enterprise Network and the local authorities are doing that can be considered good practice in terms of sustainable development. None of the activities that are considered in this section are mainstream practice. Each has been undertaken as a pilot or a project and the practice is not typical of similar organisations. The activities are briefly described below and can be categorised as follows:

a. Waste minimisation projects

b. Creation and management of networks

c. Environmental business development

d. Site development

e. Training and work placements

Of these only the last example can be described as a social rather than an environmental activity and even so it still has a strong environmental focus. The approach taken to each type of activity is described more fully in the sub-sections following with reference to the specific examples that were the subject of data collection interviews.

5.4.4.2 a Waste Minimisation Projects

Waste minimisation projects are becoming more widespread in Scotland, although still dependent on grant funding, and each project targets a different audience and

may have different public sector partners but the key elements of these projects are very similar. The projects aim to support local companies, often SMEs, to reduce their operating costs by helping them to identify and implement changes to operating practice and potentially installation of new technologies to make their operations more efficient. The projects are specifically geared towards savings relating to environmental impacts so they reduce all waste arising and emissions.

Waste Minimisation Project: Grangestone Industrial Estate, Ayrshire

A total of eleven companies were involved in this project. The objectives of the project included:

- Identification of cost savings in individual companies by minimising waste, energy and water usage
- Investigation of legislative compliance of participating companies
- Identification of opportunities for collective action by companies on the industrial estate that would enhance the environmental and economic performance of individual companies

A summary of the identified potential cost savings through waste minimisation efforts is presented below.

	Electricity	Fuels	Water	Effluent	Skips Waste	Raw Materials	**Total Max. Potential Savings**
Current Costs per annum	£2.3M	£3.3M	£890k	£270k	£60k	£71M	
Approx. Maximum Savings	£115k	£313k	£37k	£150k	£24k	£540k	**£1.179M**

The investigation into compliance amongst the companies involved in the study identified nine significant breaches of compliance across six companies. The potential fines arising from related prosecutions would be tens of thousands of pounds upwards.

The study identified a number of co-operative ventures that could have increased the cost savings and reduced the environmental impacts of activity of all the companies if implemented. These included:

- development of an alternative energy supply,
- a waste transfer station to bulk up wastes and enable joint disposal, and packaging waste segregation
- transport sharing
- waste and effluent treatment reductions
- storage and warehouse co-operation to reduce vehicle movements

These co-operative ventures were proving difficult to agree at the time of interview.

Example 5.1

The support that is offered comes in a multitude of forms:

- active leadership is demonstrated in getting the projects started,
- good partnership working between the private and public sectors is essential,
- grants are made available to support some consultancy advice and/or capital investment,
- staff are available to support the implementation of the project,
- information and knowledge is fed through all these new working practices and
- tools can be developed to support the further development of the businesses in this context.

The benefits of getting involved in these projects are significant cost savings to businesses involved, better environmental management in businesses and consequently reduced waste and emissions. Potential benefits include a culture change in business towards more partnership working with the public sector and increased awareness of the benefits of sound environmental management. An example of one of the projects that was discussed during the interviews in presented in Example 5.1 above. Here for example efficiency savings of approximately £1.18M were identified across 11 companies but not all cost saving measures identified have been implemented.

Companies are motivated to do waste minimisation projects for a variety of reasons, which include increasingly stringent environmental regulation and enforcement activities. In some projects the need for businesses to work in collaboration to maximise benefits from waste minimisation projects needed to be prompted by some

outside source, such as a co-ordinator. Businesses appear to be reluctant to take up this activity without management support from the public sector. The interviewees' perception is that companies are not willing or able to allocate dedicated time to such activities.

Example 5.1 also indicates some of the problems regarding compliance with legislation even where targets and standards are set. Despite the acknowledged possibilities for cost savings, many companies are resistant to all but low cost or no cost solutions even where mid-term paybacks for investment over a few years are possible. Progress on getting businesses on the same site to work together to find cheaper solutions to waste minimisation problems has been very slow. Agencies promoting waste minimisation programmes have also found promotion difficult because the nature of the programmes undertaken to date are either sector specific or in a localised cluster. Thus outwith these sectors or locations, businesses find it difficult to understand what the findings would mean for them. Here is a case where good practice examples exist but take up of the initiatives outside funded projects is low despite the cost savings being made obvious.

Waste minimisation seems to offer a win-win solution to improving the environmental impact of business while improving their competitive position, however this solution alone does not support the full scope of sustainable development options. Waste minimisation projects exclude consideration of the social impact of businesses on the community. The eco-efficiency approach may also externalise social problems if companies seek to reduce wastage by relocating to

another area and building new facilities. The debate regarding the potential effect of efficiency savings on increasing consumption has not been resolved. No change in design or product development has yet been reported from work on waste minimisation programmes. Although this is not a primary aim of these projects, decoupling economic growth from natural resource use is the ultimate policy objective of the EU in terms of achieving sustainable development and this is not achieved by simple low and no-cost efforts in efficiency.

5.4.4.2 b Creation and Management of Networks

Enterprise companies have encouraged networking amongst businesses through establishing business clubs. These clubs, aimed at SMEs, have the purpose of providing information through guest lectures and encouraging networking amongst SMEs to facilitate exchange of good practice and development of potential partnerships. The main remit of the business clubs is in relation to environmental management. The main features of the business clubs are:

- Provision of information
- Potential development of partnerships

A list of business clubs is presented in Example 5.2 below[46]. This list indicates the limited geographic spread of the clubs across Scotland and also the varied nature and range of activities undertaken by such clubs. The activities are a reflection of the specific interests of each membership.

---

[46] the data in Example 5.2 is accurate as at January 2001

The business clubs encourage development of partnerships between small companies and can be used to communicate information about forthcoming legislation as well as other support packages such as grants, tools, placements that may be offered by the

Business Club Directory

Name	Members	Services
Angus Environment Forum	50	Meetings Training Courses
Centre for Environment and Business in Scotland	600+	Written Guidance
Environment Business Forum	N/A	Meetings Newsletter
Green Business Fife	300+	Environmental Management Systems Meetings Newsletter Reviews Workshops
Lothian and Borders Business Environment Initiative (LABBEI)	N/A	Newsletter Workshops Written Guidance
Tayside Environment Business Forum (TEBF)	95	Environmental Audits Environmental Management Systems Meetings Workshops Written Guidance
West of Scotland Environment Business Forum (WSEBF)	137	Meetings Training Courses

Example 5.2

Source: http://www.business-in-environment.org.uk/scot.html

local agencies. However the clubs only inform members of these services and facilities, they do not provide them. The interviewee was unable to offer clarification on the outcomes of the business clubs.

5.4.4.2 c Environmental Business Development

An ambitious approach to business development with sustainable development principles in mind is to select a business site accommodating several businesses and support them to improve the environmental management of the businesses. This approach is expensive to establish and to run but its benefits include:

- Encouragement of environmental management
- Partnership between public sector and private sector
- Public sector leadership in setting up such a facility
- Grants in terms of low cost or free rent on site for a set period to support business start up
- Encouraging dissemination of information to people interested in the business experiences

An example of such a programme operated in the Borders area of Scotland is given in Example 5.3 below. This example demonstrates the many advantages of a sustainable approach to economic development particularly in an area with an out-migration of people and significant need for rural development opportunities to strengthen the local economy. However the example also demonstrates that ongoing support for implementation of non-standard business practice is required to achieve real sustainable development outcomes.

This type of project requires significant funds to start up and given the nature of grant funding will only be resourced in certain declining areas. It is not a suitable solution for a wide range of areas although where it does work, it may lead to new technologies and new businesses which should both have the outcome of reduced environmental impact and stimulation of economic growth with social benefits in a declining area.

Borders: Eco Industrial Project

The aim of the project was to show the benefits that can arise from an approach to economic development based on the principles of sustainability and to demonstrate that such an approach can lead to greater competitiveness for companies by:

- Reducing overheads
- Improving customer satisfaction
- Opening up new markets
- Encouraging the development of new projects
- Increasing sales

The programme managed by the local enterprise company offered the following opportunities to business to get involved in the programme:

- Environmental and business audits
- Training seminars and workshops on environmental legislation
- Financial assistance towards achievement of BS7750 and ISO 14001
- Financial assistance towards eco-labelling of products
- Grants to assist in developing new processes
- Assistance towards design of internet pages
- Financial assistance and advice on reducing waste and minimising energy use
- Financial assistance and advice to encourage companies to form networks

The area selected contained 58 commercial businesses. The process was to undertake an environmental review and then offer both grants and advice to the companies to make potential improvements identified during the review. Many of the measures were simple ones like changing energy suppliers to get a lower charging rate. However the onus is on the companies to act and less than half of the companies involved acted on the outcomes of the review despite the identified savings they could make. Part of this results from a lack of understanding and part from a lack of willingness to act. As small companies attention is always drawn by the core business.

Example 5.3

Source: Interview with Scottish Enterprise Borders and Clayton, Talbot and Thomson, 1997

5.4.4.2 d Site Development

Amendments to site developments making them more sustainable is another way in which the Enterprise Network can exert its influence. This type of activity works where companies are failing to get planning permission and this affects inward investment objectives. In some cases, where problems with particular sites exist and planning permission is proving difficult, it is possible to improve the chances of site development by consulting with local communities and addressing their concerns in a sustainable way during site development. The benefits of this approach are that:

- staff resources are made available to improve the preparation and design of the site,
- more information and knowledge is disseminated about more sustainable options to both the company wanting to develop the site and the local community, and
- the site becomes a more sustainable one reducing both unsustainable social and environmental impacts while still facilitating the development which improves the economic condition locally,
- it improves partnership working between site developers and a range of public sector bodies with different interests including environmental and social concerns,
- the local communities are involved in decision-making and develop a relationship with the incoming company.

This approach is time consuming, costly and site specific. Example 5.4 offers an example of where this methodology has been used. This example demonstrates a

sustainable approach to land for business development incorporating issues around local biodiversity and engagement with the local community.

Renfrewshire: Site Development, Drumcross Farm Project

This site development is for an area that has been identified in the Renfrewshire Council Structure Plan for development but it is currently a high amenity site. Having been identified in 1980 for development, the site twice failed to achieve planning permission for development. Following failure of the second inward investment enquiry, the local enterprise company decided to take a more proactive stance to development of the site.

The project was developed through a masterplanning exercise with the aim to develop it sensitively to environmental issues. The planning stage invited a number of partners to participate who were known for their expertise in environmental and sustainable planning design. The methodology includes an assessment of the site's environmental sensitivity and its capacity to develop through an understanding of its historical, environmental and social context. Historical timelines are used to help visualise the pressures and the development of the area. It also enables reintroduction of habitats and species that were driven out by earlier redevelopment.

A key issue that arose during this process was the drainage of the area and the proposed site development incorporates a reed bed and pond drainage system that contributes to biodiversity while remedying the drainage problem. Communications and public access to the site were significant issues and lengthy consultation with the local community eventually led to a satisfactory resolution to these problems. For example it was found that the introduction of traffic calming measures swayed the opinions of some local people previously opposed to the development.

Overlaying all the various issues that arose through the studies and the consultation process on the maps of the site enables a clear picture of site to form and offers options for sustainable development taking all the pressures into account.

Example 5.4

Source: Interview with Bill Devlin, Scottish Enterprise Renfrewshire

5.4.4.2 e Training and Work Placements

Student placements have been used to good effect by some grant-funded programmes. These programmes employ students over a holiday period or on a work placement to work in companies on waste minimisation work. From an environmental perspective this activity therefore has the same outputs as a waste minimisation project. In addition to that, other benefits are that students get

industrial experience and environmental knowledge. The students employed can be studying for either environmental qualifications or more industrial applications. A further benefit of the scheme is that it creates links and possibly develops partnerships between businesses and educational establishments. Again however the effect of the placements is limited by their focus on waste minimisation issues. The effect of the students working within companies has a motivational effect on the companies themselves and it is possible that such placements will contribute to

Training and Work Placements: STEP

The Shell Technology Enterprise Programme (STEP) is part of the Business Environment Partnership operated by the Midlothian Enterprise Trust. The partnership has assisted over 400 companies identifying savings of over £2.5M and creating 25 new jobs. The support is to help companies improve environmental management systems and to make significant efficiency savings. The objective is to demonstrate the competitiveness feature of environmental management.

Around 35 partners sponsor student placements to assist in working with the companies to support the programme, including Shell. 157 students have taken part in the programme and have identified cost savings to companies in excess of £1M. Many of the outcomes from the programme are typical of waste minimisation and improved environmental management in terms of resource efficiencies, reduction of waste and emissions and the consequent cost savings. A further benefits from involving the student placements is a creation of linkages between SMEs and educational organisations. Students also gain invaluable experience and environmental knowledge enhancing their career prospects. The companies found the students' assistance to be extremely helpful and it supported a fairly resource intensive programme of identifying and implementing savings that the companies may not otherwise have been able to resource.

Example 5.5

Source: Presentation by John Forbes, Midlothian Enterprise Trust at EDAS Conference, 4th/ 5th October 2001

corporate culture changes but this aspect has not been evaluated in the projects to date. Example 5.5 demonstrates all the features described above. However it should be noted that this programme can only operate as a result of public sector grant funding further indicating that a high level of support is required to engage SMEs in sustainable development behaviour.

5.4.5 Theme 6: Integration of Sustainable Development and Competitiveness

In order to reconcile sustainable development and competitiveness, it is important to know whether or not the public sector agencies understand the potential role that sustainable development can have in increasing competitiveness and whether or not their perspective is a barrier to working on sustainable competitiveness. In particular cases, the perspectives that certain decision-makers and the whole organisation have regarding competitiveness will give some indication of the extent to which they view it to be compatible with sustainable development. This will clarify understanding of where attitudes in the public sector offer scope for implementation of sustainable competitiveness within the existing framework.

5.4.5.1 Aspect of Research Interest

Understanding the framework that the Enterprise Network is operating within regarding competitiveness is explored by asking interviewees' perceptions of competitiveness. This when balanced with their views on sustainable development will offer some insight into the relative priority and possibility for integration attached to each subject. Analysis of the priorities attached to both sustainable development and competitiveness during decision-making within the Enterprise Network will also increase understanding of the key issues that drive decision-makers. In researching interpretations of competitiveness, understanding of potential compatibility of the current interpretations with sustainable development will be sought. This will demonstrate whether or not the Enterprise Network is currently willing to interpret sustainable development and build it into the work of the organisation.

5.4.5.2 Research Findings

Although both competitiveness and sustainability are featured as priority issues in the *Framework for Economic Development in Scotland* (FEDS), the Enterprise Network gives much more of a priority to competitiveness than it does to sustainable development. Competitiveness is a key consideration in decision-making. Reflecting this is the importance attached to monitoring and basing decisions on key competitiveness indicators such as:

- available labour supply,
- rates of pay,
- communication links,
- GDP,
- disposable income per head,
- labour productivity,
- income support,
- percentage of manufacturing investment output,
- average earnings and
- working age population in employment.

While the competitiveness indicators do reflect important socio-economic considerations in economic development, they do not take the long-term into account nor do they take environmental impacts into account that can have long-term or global effects on the capacity of particular developments to improve the situation regarding the indicators listed above.

Although the guidance documents and the rhetoric describes sustainability as a priority for the Enterprise Network, the ways in which the organisations function and the priorities attached to decision-making indicate that these agencies do not perceive sustainable development to be compatible with competitiveness. Further, the agencies have not prioritised the development of means to integrate sustainable development into mainstream activity. This appears to be a result, not of a lack of understanding but a lack of commitment, or motivation to commit, to seeking ways to maximise the opportunities from this policy issue.

5.5 Discussion

The actions that agencies are taking in relation to sustainable development are not mainstream activities. They are always project-based and funded through additional grants rather than core resources. This has the effect of making it appear that responsibility for sustainable development in Enterprise Companies and other public sector organisations falls to those involved in the project only. Thus experience of working on projects and understanding of sustainable development does not filter through organisations.

Of the projects that are delivered with sustainable development goals there are a number of drivers and supports similar to those identified in Chapter Four which demonstrate good practice by the Enterprise Network. The common features are as follows:

- leadership in relation to specific projects only
- the benefits of partnership working
- grants offered to support the development of new ideas

- knowledge and information disseminated to companies working with the public sector and in some cases to the wider community
- tools are developed and their use demonstrated
- staff resources, especially student placements, have proved invaluable support for businesses that are small and not sufficiently resourced to implement new ways of working.

The outcomes of the activities are:

- Engaging partners
- Eco-efficiency
- Focussed engagement
- New products and market creation
- Natural environment conservation and regeneration

A matrix similar to that developed in Chapter Four is presented in Table 5.3 below showing the results from the interviews in the public sector. The table reflects the interview results in relation to social and environmental activities as described throughout Section 5.4.4. The conclusions, later, pick up findings regarding the policy context. In Table 5.3 there is a degree on tonality, which indicates the proportion of case studies that demonstrate the features described in the matrix. A lighter shade indicates only one or two case studies demonstrate the given feature, whereas the darker shade indicates that 3 or more case studies demonstrate the given feature.

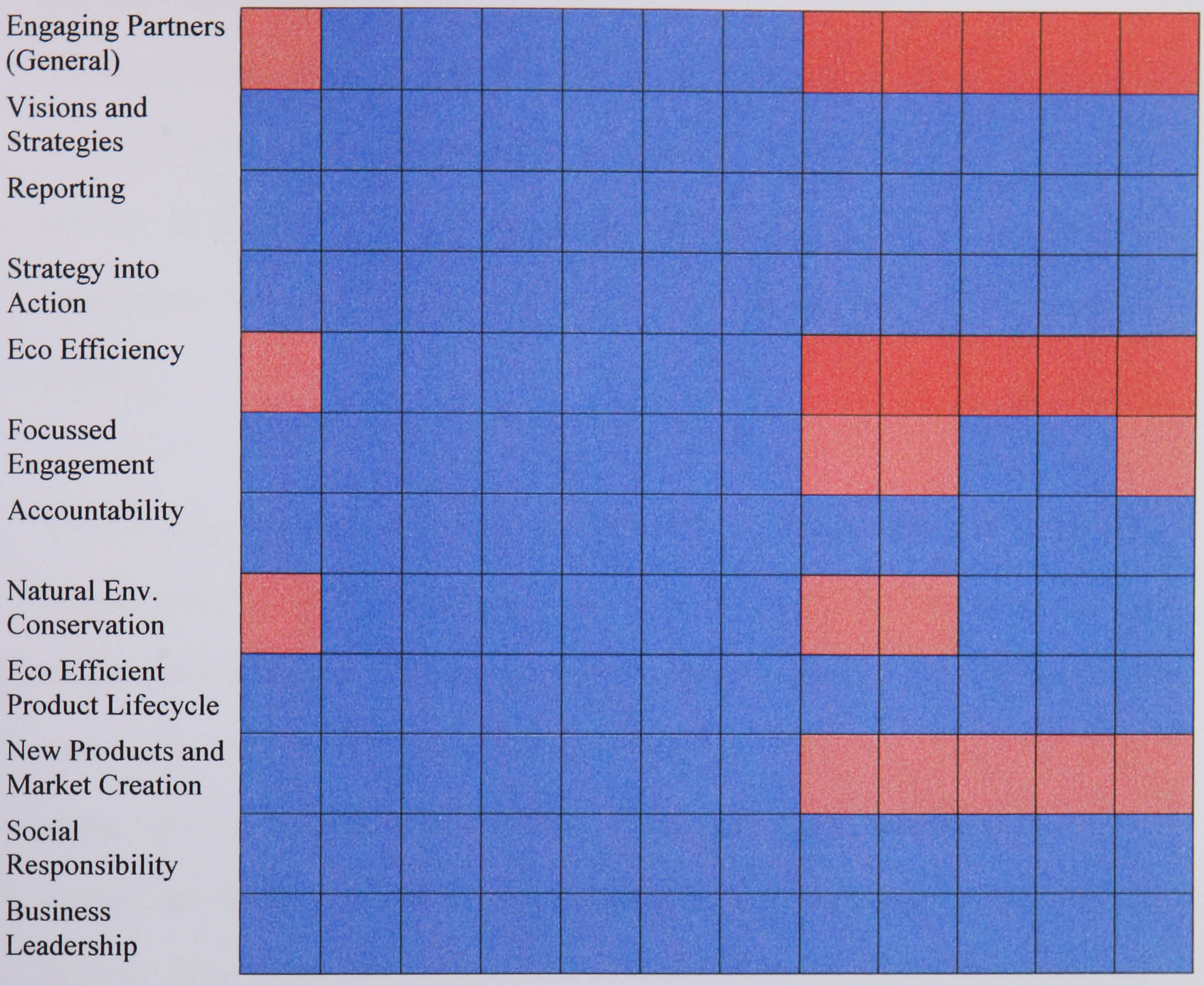


Table 5.3: Public Sector Sustainable Competitiveness Matrix

Table 5.3 indicates that the main support mechanisms in use by the public sector are partnership, the dissemination of information and knowledge, staff resources and tools. Grant funding is an additional feature to the table as it is often used by the

public sector to support and generate interest in the types of activities being encouraged. The interviewees mentioned the use of regulations or market mechanisms to encourage specific activities infrequently. As local delivery agencies and non-regulators in all but one case (the Scottish Executive), they are not responsible for setting, enforcing or administering regulations or market mechanisms as tools to deliver sustainable development activities. Also since relevant regulations are not in existence for implementation by the local delivery agencies, the interviewees could not describe projects that were encouraged or motivated in this manner.

The distinction between partnerships and voluntary agreements becomes important in discussing the role of the public sector. In all the examples described throughout the chapter, except perhaps Drumcross Farm in Renfrewshire, the public sector is working in some sort of partnership with business. However, the only example where business is volunteering activity, rather than simply accepting advice or support, are the Tweed Horizons and Selkirk Riverside projects in the Scottish Borders. What this shows is that the use of voluntary agreements to find innovative and more competitive ways for attaining compliance with regulations is not common practice in Scotland. It also indicates that all the efforts directed at making business more sustainable in Scotland may be raising awareness but are doing little to change behaviour.

Table 5.3 also indicates the range of activities that the public sector has encouraged. Unsurprisingly the activities have encouraged active roles in engaging partners in

starting and implementing the projects described and eco-efficiency. In some cases the projects have encouraged more focussed engagement by business with local communities and encouraged some sustainable business development through new product and market creation (Tweed Horizons and Selkirk Riverside, Scottish Borders). Most surprisingly, the activities of the public sector have actually encouraged natural environment conservation in one project. Although the public sector role has been largely motivated by planning regulations in this case (Drumcross Farm, Renfrewshire), the use of partnerships and dissemination of information and knowledge through the planning tools has made this a more sustainable approach than otherwise may have been the case.

The emphasis on general engagement reflects the Scottish policy approach described earlier. The emphasis on eco-efficiency suggests that even where such opportunities are arguably competitive, companies are not taking advantage of the opportunities as a result of public sector intervention. The value of work involved in such effort demands to be compared against the real benefits, as public sector intervention in what appears to be the most immediately competitive aspect of sustainable development in business and industry may be the factor that makes it anti-competitive.

5.6 Conclusions

The chapter has explored the policy and the practice of the public sector in Scotland in its efforts to reconcile sustainable development and competitiveness.

5.6.1 Policy

The government policy direction in Scotland is unclear to those public sector agencies charged with delivering it. The policy direction set by Europe is clear, if limited, and as it becomes more localised, it gets less and less clear what the government vision is and how that might be achieved. There is nothing to specifically relate the policy direction to the actual situation in Scotland. The policy framework in Scotland does not fully reflect the European or the UK policies. It would have more correlation if it were to take public health issues into account and recognise the benefits of complementary target setting and monitoring through development of indicators consistent with the UK at least. Development of a separate environmental strategy by Government would clarify the role of the sustainable development strategy, which itself needs to be formalised, and make clear the links to other strategies to demonstrate government commitment and leadership.

The UK's failure to adopt the Best Available Technology (BAT) standards has significantly weakened the capacity of the UK to stimulate innovation for sustainable products and lifestyles. Nowhere in the UK policy framework is the link between sustainable development and innovation made explicit. In fact this is just one of the recommendations of the AGSD that has not been adopted in Scotland or the UK. The possibility of encouraging innovation through the development and promotion of sectoral sustainable development strategies for business and industry appears to have no resonance in the Scottish public sector. As there is no public sector priority or

activity on innovation for sustainable development, the impact that these strategies have will be analysed in the following chapter on private sector activities.

The priority that government has attached to sustainable development is low and it has been recognised as such by the agencies that are responsible for delivering it. Until further commitment from government is evident either in the form of more legislation, resources or better and clearer guidance on roles and responsibilities sustainable competitiveness will be left to the market to develop.

Lack of government commitment to sustainable development is also evident in terms of its impact on institutional structures and lack of clarity on roles and responsibilities in public sector agencies. In relation to institutional structures, the way in which sustainable development and other public sector activities are financed leads to difficulties in implementing multi-disciplinary team working and potentially risky innovative project-based activity. The clarity on roles and responsibilities that government has been unwilling to define perpetuates this situation of isolating sustainable projects both in terms of grant funded projects and in terms of creating a specialism within the organisation that only one or a few officers have. However grant funding has been a key support mechanism for most activities that are taking place.

Scottish competitiveness strategies address uses of labour, trade, wealth and innovation. They do not address issues about the natural resource base to the economy or the dependence on the natural resources of other countries. Where these

strategies make reference to sustainable development, they do not explicitly describe the role of that in the context of competitiveness. This indicates a reliance on the sustainable development policy and strategy to clarify the potential roles or a need to further develop the competitiveness strategies.

The Scottish sustainable development policy framework fails to address conservation of natural resources, social needs, economic needs (except in regard to efficiency), innovation, decision-making or longevity of impact or resource use. It also fails to make explicit links to other relevant strategies. In fact it only addresses the management of a select group of natural resources related to waste, energy and travel (W-E-T) avoiding altogether biodiversity, land use or habitat preservation. While these natural environment issues are addressed by other policies, the failure of the sustainable development strategy to make these links makes a strong statement about the lack of commitment and leadership of the Scottish Government to sustainable development. It also makes a strong statement about the lack of understanding of the potential to reconcile sustainable development and competitiveness, thus missing the opportunity to add value to the Scottish economy.

In relation to Agenda 21's priorities for business and industry as described in Chapter Three, the Scottish public sector appears to be making efforts to promote cleaner production, albeit potentially ineffectively. The public sector however fails altogether to promote responsible entrepreneurship. There was little mention that the public sector was even making an effort to promote responsible entrepreneurship. Consequently the less than complete approach to implementing the recommendations

of Agenda 21 in regard to business and industry can be considered alongside the vast potential that goes beyond these recommendations, as indicated in Chapter Four. It is then possible to conclude that the approach of the Scottish public sector in regard to sustainable development and the business and industry sector is extremely weak.

There is an emphasis on efficiency and a failure to pick up on the potential of innovation, as well as the lack of leadership and clear communication that could potentially stimulate demand for new, more sustainable products and designs in the Scottish public sector approach. It is thus only partially able to offer sustainable competitiveness and far from capable of delivering sustainable development in the business and industry sector.

5.6.2 Practice

One key result of the lack of clarity on policy direction is that there is poor understanding of sustainable development in practice in the agencies charged with its delivery. Levels of understanding vary with the best understanding coming from those staff involved in specific project delivery. The lack of understanding of sustainable development has been perpetuated by a number of factors. Firstly, despite efforts to improve it, there is a misrepresentation of sustainable development as an environmental issue that is perpetuated by funding sources for projects and allocation of responsibility in public sector organisations. Secondly there is a lack of resonance regarding the importance of sustainable development to Scotland in practical terms. Thirdly at a management level, the allocation of responsibility for sustainable development to single officers and isolated projects rather than across teams or mainstream activities within delivery agencies perpetuates the lack of

spread of good practice. Fourthly the government's priority given to communicating messages about the concept rather than the practicalities of sustainable development is a demonstration of the lack of leadership. This failure in communication significantly undermines any capacity for the public sector to communicate responsibility for sustainable development, as recommended in Agenda 21, and thus undermining potential for changing consumer behaviour or creating a demand for more sustainable lifestyles.

The examples of good practice developed by the public sector demonstrate the predominant view of the public sector that sustainable development is an environmental issue. Eco-efficiency and partnership approaches are the most apparent means of addressing sustainable development by this sector despite a lack of Scottish policy direction. However such priorities are closely linked to the stated aims of the 6EAP and the UK strategy. The UK strategy does not however reflect the emphasis on market mechanisms and engagement with citizens promoted in the EU sustainable development strategy. Without actually stating a policy that aims to encourage this kind of activity the Scottish Executive is actually supporting some element of ecological modernisation activity, despite its own limited policy agenda.

While the waste minimisation programmes favoured by public sector efforts to reconcile sustainable development and competitiveness often target priorities related to waste and energy, they have not to date addressed travel issues. Consequently waste minimisation and eco-efficiency can be used to argue that the Scottish Executive's public policy focus of waste, energy, travel (W-E-T) is partly being met

but there were no measures or projects in place that encourage more sustainable travel at the time of data gathering.

The Scottish Enterprise Network appears to have little understanding of the wider benefits of sustainable development for competitiveness beyond waste minimisation and efficiency programmes. Such programmes form, almost exclusively, the basis of the efforts for involvement in sustainable development. This unimaginative approach is partly a product of the lack of commitment to sustainable development from the government and partly a result of the lack of commitment from Scottish Enterprise itself.

Some of the possible drivers and support mechanisms are not utilised by the Scottish public sector. The agencies fail to understand any possible role they might have in influencing business behaviour in relation to innovation, for example through product development or marketing that could make these businesses more sustainable. Sustainable development is still perceived as an additional responsibility to the Enterprise Network. The leadership from government has been inadequate to encourage development of new ways of working or to instil a sense of responsibility into the staff at the Enterprise Network in regard to sustainable development. This is reiterated by the lack of influence from global trends, business risk, stakeholders or identification of new market potential where the Enterprise Companies at least should have been able to demonstrate some leadership and imagination to integrating these core business concerns with efforts to implement sustainable development.

At the present time sustainable development is only delivered on a project basis in the Enterprise Network as compared with the mainstream goals of competitiveness. Within these organisations sustainable development is not viewed as enhancing competitiveness, but as an additional responsibility that is under-resourced and not a priority in an already stretched organisation. Where conflicts of interest between sustainable development and competitiveness arise, as they are perceived, competitiveness is viewed as the priority issue. However as the Drumcross Farm project in Renfrewshire demonstrates a competitive approach can also be a sustainable one. There is an emphasis by the public sector on waste minimisation/ efficiency projects, without apparent consideration for the need for such projects to be replicated much more widely and the probable lack of implementation of recommendations for efficiency low and no-cost solutions. This indicates that the public sector remains focussed on short-term solutions without considering the wider implications of grant aided funding on long-term competitiveness or means to create a sustainable approach to this potentially competitive approach to sustainable development.

CHAPTER SIX: SUSTAINABLE DEVELOPMENT IN THE PRIVATE SECTOR IN SCOTLAND

6.1 Introduction

The examples in Chapter Four demonstrate a wide variety of ways in which business and industry can contribute towards sustainable development. The businesses in the examples given illustrate that the role of business and industry is not limited to that outlined in Agenda 21. The examples were however amongst the best in the world and the motivation for that behaviour was not clear. In order to identify how to encourage such behaviour more widely it is important to understand the motivations behind it. This chapter presents the findings of research into the views and activities of a selection of private sector companies that are perceived as performing well in terms of sustainability in Scotland. The objective of the research presented here is to find what motivates and promotes good practice in sustainable development within the private sector and particularly amongst those companies based in Scotland.

6.1.1 Chapter Outline

Following the introduction, the second section of the chapter describes the particular research themes investigated through the interviews. Six themes were explored and these are described in Table 6.1 below. The third and final section concludes the chapter noting the level of influence on sustainable behaviour in the companies interviewed. An overview of the types of actions and their motivations is taken and presented in the context of the sustainable competitiveness matrix developed in Chapter Four. Finally, a conclusion regarding the level of integration between sustainable development and competitiveness in the private sector is reached.

RESEARCH THEMES

1. Perspectives and Responsiveness to Government Priorities and Actions
2. Understanding of Sustainable Development in Practice
3. Ability to Deliver Sustainable Development
4. Form and Effectiveness of Actions (Environmental)
5. Form and Effectiveness of Actions (Socio-Economic)
6. Integration of Sustainable Development and Competitiveness

Table 6.1: Research Themes

6.1.2 Methodology

Research has been carried out into eight companies predominantly based on interviews with key members of staff in those organisations. A full list of interviewees and company profiles is given in Appendix Three. Additional information adding value to that gained from the interviews has been sought through literature reviews into the companies and particularly from any environmental, social or sustainable development reporting which those companies undertake. The companies interviewed and the business sectors they are in are as follows:

- Railtrack, Transport
- BP Amoco, Oil and Gas Exploration and Production
- Shell, Oil and Gas Exploration and Production
- Scottish Power, Utilities in Electricity, Water and Sewerage
- BT, Telecommunications
- United Distillers and Vintners, Spirits Manufacture and Distribution
- Belhaven Brewery, Beer Distillery and Distribution

- Smith Anderson, Paper Manufacturing

Full details of the methodology for selection of the companies are presented in the introduction to this thesis. To briefly recap: this thesis focuses on learning from good practice. There are two key sources of information about companies that demonstrate good practice in sustainable development. The first is through various award schemes where companies are awarded recognition on the basis of good practice often competitively in particular categories. The second source of information is from the public sector where companies have worked with voluntary, not for profit companies or public sector agencies to deliver some aspect of their corporate business in a more sustainable way.

In order to maximise benefit and understanding of good practice from a limited number of interviews companies were approached for interview that demonstrated good practice in more than one area of activity relating to sustainable development. For example, some of the award schemes identify good practice related to environmental management where others related to social practice. Interviews were sought from companies that reflected a range of different sectors. However certain companies were difficult to get hold of and some refused interviews on the basis that they were asked for such information too often. Companies in the retail and financial sectors were unwilling to give interviews.

The companies selected for interview were predominantly large companies. However a range of all types of companies were sought. Of the large companies some were multi-national, some global and others such as Railtrack large national

companies. The list of interviewees includes a small company (Belhaven Brewery) and a medium sized company (Smith Anderson). The reason for including smaller companies in the list of interviewees was to understand if smaller companies (SMEs) were working with different pressures to larger companies and to find out if their approach to sustainable development was any different as a result. The SMEs that were chosen were also actively involved in public sector initiatives and again it was of interest to explore whether or not this made a difference to their approach to sustainable development. A full list of the interview questions is given in Appendix Eight.

The research themes outlined in Table 6.1 have been selected through earlier literature review analysis for the thesis and refined through undertaking analysis of the interviews. The interviewees were selected on the basis of appropriateness to discuss the examples of good practice identified as described above. The interviews were based around the good practice examples identified and the research results relating to these activities are described and analysed in relation to each theme throughout the chapter. Thus the interview questions and the examples identified also explore the context and the motivations for these activities. Although specific examples are used to highlight the points made in each thematic section following, the analysis in the body of the text is drawn from all the examples. The boxed examples are placed to illustrate the points made in each theme with a specific example. Consequently the findings and analysis from all the interviews are interleaved throughout Section 6.2 rather than listed on an interview by interview basis separately.

6.2 Research Themes

The research themes were selected to get an understanding of how sustainable development is perceived and implemented by the private sector in Scotland. The research themes also explore the motivations for good practice in sustainable development and any links between that and competitive business practice.

6.2.1 Theme 1: Perspectives and Responsiveness to Government Priorities and Actions

As the subject of the thesis is reconciling the efforts of the public and private sectors to make business practice more sustainable, the relationship between government and business is critical. The views and responsiveness of business to government priorities will offer insight into the features of government practice that are more influential and under what circumstances influence is strongest. In particular the attitude of companies in general terms, the impact of government legislation or market mechanisms on each business, the extent to which companies influence government policy and the mid- to long-term direction of government policy all affect corporate perspectives and responsiveness to government priorities.

6.2.1.1 Aspect of Research Interest

During the interviews, questions were asked which offered insight into each company attitude to current government policy. In addition companies were asked to express their views on the impact that they felt government policy had on their operations and the extent to which each company attempted to influence policy. Lastly companies were asked what they felt would be an important role for

government in delivering this agenda on sustainable development and in encouraging businesses to become more sustainable.

6.2.1.2 Research Findings and Analysis

The research findings showed a number of aspects of government policy were found to have influenced companies in different ways. These were:

a. Company attitude to government policy

b. Impact of government policy

c. Role of companies in influencing policy

d. The perceived role for government

Each of these is explored in turn below.

6.2.1.2 a Attitude to Government Policy

Companies look to government and the public sector for direction and communication of their understanding of sustainable development. As a reflection of their status as proactive companies, many of the companies interviewed primarily wanted the government to establish a clear vision of sustainable development which was tangible enough to allow those companies to position themselves and work towards a means of achieving that vision. It was stated that such a vision should be long-term to suit the corporate long-term planning scenarios (up to 50 years for Shell, and 10 to 20 years for BT, for example). Long-term visions also reflect political stability which is a very important feature for companies like Shell, which cannot easily change locations but require the countries they operate in to be open to free trade across the world.

Companies do not on the whole feel that sufficient vision and direction has been given. However the role of sustainable development indicators in making some progress towards this vision was noted. Some companies welcomed the UK indicators and accompanying report noting that it helped to guide their own target and indicator setting in relation to sustainable development activities. However there appears to be some sectoral bias with energy companies welcoming the indicators and BT stating that it would like to see more indicators which reflect the positive role of the Information and Communication Technologies sector (ICT) in delivering sustainable lifestyles.

In short, the companies interviewed do not think that government policy is specific enough, it lacks clear long-term vision and is not specific enough to enable companies to identify actions to implement sustainable development. Government priorities were not well-communicated to companies with none of the interviewees recognising W-E-T as the government priorities for sustainable development in Scotland.

6.2.1.2 b Impact

Many of the companies noted some impact of government policy or legislation on their activities. Railtrack has been seeking ways of responding to pressure over biodiversity that has come through as a very strong policy message from the Scottish Executive by working with government agencies, given Railtrack's status as a major landowner. This is the only example of government leadership influencing business approaches to natural environment conservation. This company has also welcomed the Climate Change Levy as a means to communicate business cost issues as linked

to environmental considerations. UDV, as a consumer of high volumes of energy and distributor of products using large volumes of packaging materials, has noted that both the Climate Change Levy and the Packaging Regulations have had a significant impact on their operations and have acted as a motivator to change. BT too has acknowledged that operating on such a large scale means that financial incentives and regulations, which affect the cost of operation, will have some influence on decision-making.

In the smaller companies, Belhaven Brewery and Smith Anderson, government regulation has had a significant impact on their operations but the support in implementing changes to their operations to address the impacts of more stringent legislation has been invaluable. The support and guidance in meeting the demands of legislation prevented these businesses from being overwhelmed by the cost of the measures required to meet legislative standards thus engaging them but not necessarily informing wider business strategies. This support and guidance has been packaged as development of partnerships with government agencies through provision of information, supporting the companies gaining knowledge about their operations and promoting grants.

6.2.1.2 c Influencing Policy

All of the companies interviewed were to some extent influencing public sector understanding of their operations but only the larger companies were actively seeking to influence government policy. Belhaven Brewery and Smith Anderson have increased the understanding of one of their regulators (water) of the pressures they are under in working in partnership with them to improve the eco efficiency of

their operations. The partnership was instigated by a government agency offer of grant. This government agency instigated partnership aimed at improving eco-efficiency offered grant aid, measurement and monitoring tools and information and knowledge to affect company behaviour.

Railtrack has been working with government on specific regulatory issues that affect how they deliver services. Railtrack are also affecting local policy delivery in terms of the role they have decided to take in relation to biodiversity. By producing a Scotland-wide strategy for biodiversity without working with every local authority they are setting a clear lead on their approach in consultation with other key national agencies. However this might affect the Local Biodiversity Action Plans being produced by each local authority.

BP and Shell have both sought ways to get a close link into the direction of policy thinking, both in Scotland and the UK. Shell is the only private sector company to participate in the Cabinet Sub-Committee on a Sustainable Scotland (CSCSS) in the Scottish Parliament. BP has a senior member of staff participating in the UK's Sustainable Development Commission. Both companies are engaged in the UK government established the UK Offshore Oil Association (UKOOA), which is producing the first sustainable development strategy for the oil and gas sector. One way to get invited into these groups is to have a good reputation for delivering real change in sustainable development. It is possible that all the activity undertaken by these companies in terms of sustainable development is aimed at getting engaged into groups like this where policy direction is set and long-term vision can be

developed. BP and Shell are thus both engaged in influencing policy in this way and in gaining the long-term vision from government which they require to develop their long-term corporate plans using the discussions to inform new market potential thus reducing business risk. Their motivation is also to influence the direction of policy development and how it may be implemented, ultimately through regulations and market mechanisms. Such large companies have expressed little interest in the support that government or its agencies can offer.

BT is attempting to gain a similar level of influence by sponsoring the digital futures project and lobbying government to establish a sectoral group on ICT as a solution to sustainable development issues, again motivated by exploring new market potential as a way to mitigate business risk.

6.2.1.2 d Role for Government

Broadly the companies interviewed want to see increased effort from government in relation to sustainable development. The first is to offer clear direction on policy and take a strong lead in delivering this. The second is to improve public awareness and understanding of sustainability issues.

In the first case companies have a number of suggestions as to how a clear direction on policy and a strong lead in delivering it might be realised. Indicators were mentioned frequently and companies see the government setting sustainable development indicators and reporting on them as a clear indication of where the government wants social, environmental and economic patterns of development and improvement to go. This also provides a long-term framework. In addition

companies would like to see more sector specific initiatives such as the public sector taking a lead on purchasing green energy and improving energy efficiency in publicly owned facilities and housing. Examples of good practice were also cited as potential ways to encourage changes in corporate activity. Companies would also like to see more consistency from the different government departments and public sector agencies about the role of sustainable development and its priority in relation to, or links with, other policy initiatives.

In the second case companies are interested in government taking an active role in changing public opinion and increasing their understanding of sustainable development issues. This is partly to generate consumer interest in new products and create a demand for more sustainable technologies. However it was also mentioned in the context of communicating with and motivating staff to undertake more sustainable practices in their daily work. In large companies communicating a culture change of a scale such as that of sustainable development is extremely difficult. Younger employees are more aware of sustainable development initiatives but to increase awareness amongst the rest of the workforce, people would benefit from being given the information outwith their working environment and creating a desire to make changes where they can at work.

6.2.2 Theme 2: Understanding of Sustainable Development in Practice

A company's understanding of sustainable development will vary with the corporate objectives and its situation. A company's understanding of sustainable development

will also affect its perception of the effect of sustainable development on corporate competitiveness and whether or not a company will perceive sustainable development as an opportunity or a threat. This distinction is particularly important when the emphasis on innovation as a potential solution to sustainable development is considered. While all companies might respond to threats, only proactive companies will respond to opportunities.

6.2.2.1 Aspect of Research Interest

As noted in Chapter Five, government takes a strong environmental stance on sustainable development and it is of interest to explore whether or not companies share this view. This is identified through questions about the approach the company takes to sustainable development and its understanding of the term sustainable development. In addition the background and roles and responsibilities of the people involved in sustainable development offers some insight into its perceived relationship with environmental management and/or social aspects of business practice. Additionally it is of interest to gain insight into whether or not the companies interviewed perceive sustainable development as an opportunity or threat.

6.2.2.2 Research Findings and Analysis

As noted above, the research investigates both the understanding and the approach of companies to sustainable development.

6.2.2.2 a Understanding of Sustainable Development

There is a range of both skills and roles in the staff within the companies interviewed in relation to the corporate approach to sustainable development. This role appears to reflect each company's approach to sustainable development to some extent and

the importance that each company associates with particular aspects of sustainable development.

In the SME companies the role of environmental management is linked to the core business roles and is one part of each person's job. In bigger companies it may be the whole function of one person or even the responsibility a team. The example for this section (Example 6.1, UDV) reflects the engineering nature of the business and the management role is a reflection of the necessity to seek cost savings and budget control. However the company's activities demonstrate an awareness of the fragility of the socio-economic and natural environmental conditions where many of the companies operations are located demonstrating a broad understanding of sustainable development. In both Railtrack and BP there is strong emphasis on communicating sustainable development principles within the workforce. This is viewed as a key way to engage the workforce and promote the cultural change seen as necessary to integrate the principles of sustainable development into daily workloads and make incremental changes to processes and procedures. The staff in each case here has technical knowledge of sustainable development and is making efforts to translate that into the interests of the company. In Shell also the key officer has a role in communication but this time it is in external communication reflecting the high priority attached to public perception of the company in relation to social and environmental issues. In Scottish Power, where the key area of interest is in risk management the responsible officer is a senior manager able to translate sustainable development issues into perspectives on risk relevant to the company.

UNITED DISTILLERS & VINTNERS: ENVIRONMENTAL PROCESSES

UDV's policy is to focus on areas of key environmental significance in its operations and concentrate initially on assessing and improving performance in these areas. Once this has been achieved the company will give consideration to areas of smaller gain and longer-term sustainability. The business's most significant environmental impacts are connected with the use of energy, the resultant release of carbon dioxide to the atmosphere and the use and discharge of water. Other areas being addressed by UDV are solid waste, liquid effluent and air emissions.

UDV works in traditional ways to reduce its environmental impacts but in addition it has developed key projects specifically in regard to energy and water use which can be described as innovations to enable further improvements to the approaches currently underway addressing environmental impacts.

UDV has a significant requirement for energy; in particular in distilleries that mash and cook cereals prior to fermentation and dry cereal residues to produce animal feeds. Distilling consumes around 80% of the total energy consumption within UK operations. An 11% reduction in energy consumption was achieved from 1990 to 2000.

UDV has engaged partners in other operations to address energy efficiency, energy use from renewables, reducing carbon dioxide emissions and energy security and reliable supply. One such example is in the Islay Energy Project. UDV is a partner in the Islay Development Company, established as Scotland's first sustainable development company to deliver a series of projects demonstrating how the concept of sustainable development can become a reality. One of the main projects run by this company is the Islay Energy Project aiming to promote development of wind and wave power, demand side management, electric vehicles and an Energy Management Centre. To date the UDV backed project has supported the construction of a prototype wave power generator, backed proposals for a wind farm and carried out a programme of home insulation to reduce demand.

In addition to a number of process improvements reducing water use in operations and looking to the future, the Diageo Foundation (the charitable foundation linked to UDV) has supported the Water of Life project which funds over 70 water related projects in 37 countries across five continents. In Scotland the project researches salmon lifecycles. During the production of malt whiskey a distillery uses large amounts of water for cooling. The water is returned to the river unchanged except for a small uplift in temperature. Scientific research has shown that the artificial warming can be beneficial to fish growth. However it was unclear what effect this activity would have on the lifecycle of the salmon. The main results of the research programme will provide evidence to enable an informed decision to be taken when temperature limits are being considered.

In the UK pilot transport projects have also been launched which develop means for more sustainable transport of products and staff. Shieldhall is one of the largest packaging plants in the spirits industry and containers are taken by road to the nearby Russell terminal where they join the rail network for transport to the port of Felixstowe. At Clydeport containers are filled on a weekly basis and loaded onto a feeder vessel which ships the containers to Greenock for transfer onto a container ship and delivery overseas. Both these initiatives have transferred significant volumes of product from road to rail and sea. Future plans will reduce the environmental impact of travel to work and business travel.

Innovations in glass bottle design have reduced use of raw material and energy in manufacture as well reductions in overall weight of packaging bringing both commercial and environmental improvements.

Example: 6.1

Source: Interview with UDV and UDV Website

The breadth of knowledge of these officers is to some extent a reflection of the corporate views of the relationship between environment and sustainable development. All the officers in the large companies were well aware of sustainable development theory and to varying degrees the practicalities of implementation. In all cases these companies interpreted sustainable development as appropriate to current business activities and future opportunities. Only in the two small and medium sized companies was a lack of understanding of sustainable development theory evident. The difference between the two sizes of companies is that the large companies have the resources, human and capital, to investigate the potential of sustainable development and invest in strategies to capitalise on that. The small and medium sized companies do not.

6.2.2.2 b Approach to Sustainable Development

The companies have different reasons for undertaking action in sustainable development and thus making the shift from strategy to action. In the case of the two small and medium sized companies the pressure came from a need to be very cost focussed as they and their competitors were all struggling to retain a foothold in their markets. The incentive for this particular action came from early warning of increased charges for water from the local water authority as well as the offer of consultancy support and specifically designed monitoring tools from the same company to reduce overheads inflated by wastage in water, energy, on production processes and in solid waste, i.e. the action taken was eco-efficiency.

Energy has been a key feature in all the companies interviewed and in each case has acted as an incentive to review processes and, in some cases, products. International

prices have had the most significant influence as they have increased 8.4 times over the past 30 years and have fluctuated significantly during that period. Both Smith Anderson and Belhaven Brewery commented that, the energy price is extremely unpredictable and suffers from large fluctuations[47]. It may be that this is coupled with international pressure on energy sources and prices through the climate change talks. Equally public pressure may come to bear as widespread knowledge of the potential impacts of climate change starts to influence consumer choice. For the extractive industries reliant on fossil fuels, the limited lifetime of known supplies is also affecting business decisions and creating a motivation to diversify business interests. In the case of the energy companies, Shell, BP and ScottishPower are all large multinational companies that supply energy from raw materials. In all three cases this is predominantly from fossil fuels making them inherently unsustainable. However each company recognises that there is a risk in retaining a dominance in this area thus influencing their business strategy and the way in which they act on that. Their approach to sustainable development is to diversify their fuel sources and their business through new products and market creation ensuring that they do not lose their competitive edge at a global level.

At United Distillers Vintners (UDV), like Belhaven Brewery and Smith Anderson, a need to reduce overheads was a starting point for many environmental improvements. In addition however the company was sensitive to the fact that its location was extremely important to its product and it needed to ensure quality of life

---

47 For more information on fluctuation of energy prices see

in the communities in which it operated in order to retain skills in this highly globally competitive environment. For further details see Examples 6.1 on UDV above and 6.2 on Smith Anderson following.

Railtrack, like ScottishPower, is a previously regulated company, which appears to have a measure of environmental consciousness, and to some extent the regulators, which retain some influence over these companies, continue to promote environmental management as a cost saving initiative. Railtrack has therefore been engaged in environmental management for a number of years. In recent years however (particularly 1999 and 2000) a spate of fatal rail crashes have raised the profile of the company in regard to safety issues. Thus the company has decided to produce a sustainability report from 2000 which incorporates safety rather that just producing an environmental report. Public perception is the key reason for this shift in emphasis.

BT is quite a different company in terms of their services and products. Thus while the company does have a significant environmental impact through its operations, its reasons for pursuing environmental management and latterly sustainable development are quite different from those offered for the companies mentioned above. Initial involvement in environmental management issues started before the production of environmental reports that have now been produced since 1992. Again a previously regulated company, BT had a strong environmental awareness and cost

---

http://dallasfed.org/htm/data/data/oilhours.tab.htm, 20/01/02

consciousness. Latterly however as the company faces an increasingly competitive environment it has started to pursue sustainable development with the marketing approach "Part of the Solution". The corporate approach here is principally about branding and market recognition.

Each of the businesses interviewed makes a strong connection to their environmental impact and many of them identify with the social aspects of sustainable development. Where all the companies are responding to sustainable development initiatives, such as new regulations, as a threat to be managed, the large companies are in addition in some cases turning this threat into an opportunity for business development.

6.2.3 Theme 3: Ability to Deliver Sustainable Action

The ability of companies to deliver sustainable action is affected by a number of features that distinguish one company from another. The sorts of features that will affect this delivery are specific features of business operations such as the scale at which the company operates and its key factors, raw materials and processes. In addition companies ability to deliver sustainable action will also reflect the features that each company sees as giving them a competitive edge and how their socio-economic operations enable more sustainable behaviour. Each of these aspects of business and the effect they might have on a company's ability to deliver sustainable action is described in the subsections below.

6.2.3.1 Aspect of Research Interest

It is important to gain understanding about how each of these features affect business decision-making in relation to sustainable development since the differences in

approaches are as important as the similarities to gaining insight into the best means of influence from a government policy making perspective. The following data was gathered through the interview process asking specific information about the scale of operation, key features, competitive pressures on each company, socio-economic aspects of business as they relate to sustainable development pressures and processes in the business and comparing this and the company's approach to sustainable development against corporate literature.

The extent to which businesses can become more sustainable by employing good practice in environmental issues is dependent on the products and services offered by the business, its scale of operation and influence and the types of actions which it takes to mitigate environmental effects and impacts. The research considers the approach taken by business in relation to environmental action.

Different types of companies will have varying abilities and means to become more sustainable in the socio-economic context. The research offers some insight into the factors that may affect this ability such as locational links and the types of products or services as well as customer groups that the companies' efforts are focussed on. The extent to which a sustainable approach can offer a more competitive edge is also explored.

6.2.3.2 Research Findings and Analysis

The ability to deliver sustainable action can be influenced by a number of factors. These are:

a. Scale of operation

b. Key factors and processes (environmental ability to become sustainable)

c. Features of corporate competitive edge

d. Socio-economic ability to become sustainable

Each of these is discussed in turn below.

6.2.3.2 a Scale of Operation

The bigger companies have more resources for innovation, strategy and are more able to afford to plan for the long-term than SMEs. They have the ability to put in place environmental measures and investments in new technology now that will either operate at a loss for several years or make no profit. The long-term scenario illustrates that this will develop and enhance the business easing its survival in the long-term, effectively increasing its capacity to compete. For example, Shell is currently investing in technological development in Liquid Petroleum Gas (LPG) and fuel cell cars, which is more sustainable than the petrol based system in popular and current use. Shell has invested in developing LPG cars as a medium term and publicly acceptable solution. In the meantime Shell continues to develop and assist in popularising other technology that the company perceives as offering a more sustainable solution once it becomes publicly acceptable, the fuel cell technology. BP has a similar approach through its efforts in promoting and popularising solar power as a replacement to fossil fuels in electricity production.

SMITH ANDERSON: ENVIRONMENTAL PROCESSES

Smith Anderson manufactures a range of recycled papers at the company's mill in Leslie, Fife. Turnover is £65M per year and 450 people are employed on the site.

While Smith Anderson admits that it did not see waste minimisation as a key business issue several years ago, it is now a critical aspect of the company's strategy to both reduce costs and aid compliance with emission requirements: particularly regarding effluents.

Smith Anderson undertook a number of specific actions to make the company more profitable:

- Product rationalisation: a number of under performing products have been replaced with higher volumes of more profitable products. The company has reached more than 75% of its target turnover.
- Effluent reduction: significant quantities of effluent arising from the de-inking plant were ameliorated by some capital investment but changes to the product portfolio, in-plant recycling, closing up systems and avoidance of overflows all led to significant improvements in efficiency and effluent flows.

Smith Anderson's experience emphasises the importance and interaction between strategic decisions and environmental impact. The company's consideration of the two issues in parallel has resulted in a more secure and profitable product portfolio with beneficial consequences for emissions and reduced capital costs: despite a higher volume throughput.

The company has saved around £844,000 per year and reduced solid waste by around one third and effluent by around one quarter.

Example: 6.2

Source: Interview with Smith Anderson

In bigger businesses the scale of operations makes the potential cost savings from efficiency measures much bigger than in small companies. For the smaller companies the efficiency savings are smaller in absolute terms but can make a substantial difference to the bottom line of that company. In Example 6.2, Smith Anderson has saved around £844,000 per year, which has enabled the company to continue operating in an increasingly competitive global market. The merits of implementing these measures can be significant where a company is under pressure to reduce its overheads and increase its turnover/ profits to retain its market position.

However such companies have little or no capacity for capital investment of staff input and management time.

6.2.3.2 b Key Factors and Processes

In all cases of the companies interviewed energy consumption was a significant factor. In the cases of Shell, BP and ScottishPower it was as producers of energy and the key questions for them were about how to supply energy to meet demand and yet meet public and government expectations regarding fossil fuels and renewable energies. This is also an issue for each business given the global trend of questionable longevity of fossil fuel supplies. It has affected the way these companies set out their strategies, has prompted action on the strategies and been a significant factor in stimulating these companies to develop new products and seek new markets. For all the other businesses the costs of energy consumption in their operation were a significant feature.

Of all the companies only BT was potentially not tied to its location in this country by a dependence on natural resources or infrastructure. Each of the other businesses was forced to remain in its location. UDV's principle product, whiskey, must be produced in Scotland to retain its brand value. For both Smith Anderson and Belhaven Brewery both companies are tied to their location by the need to be close to a river and the prohibitively high capital cost of moving equipment. BT is perhaps technologically placed to move but it too has infrastructure and assets fixed rigidly around the country. Equally BT is heavily reliant on its British branding and its household name association in this country.

Railtrack and BT see themselves as part of the solution to sustainable development. ScottishPower does too to some extent. For Railtrack and BT it is that they are offering a less polluting and less environmentally damaging choice to people who want or need to travel and communicate. So the business itself has the potential to be inherently sustainable. ScottishPower is offering, as part of a range of services, the option to buy electricity from sustainable sources. Consumers can select to pay an additional tariff to reflect the fact that the energy they have bought has been produced from renewable resources. It also provides a basic need and ensures that low-income consumers are able to utilise their product.

The above examples demonstrate how new market potential has influenced these business strategies and how the companies have acted on these strategies. UDV is based in Scotland for the long-term and while it is a high-energy consumer and producer of waste, there is a balance between whether or not the company is inherently sustainable or unsustainable. The raw materials it uses to make its products are natural and renewable. The product is alcohol and has a lot of social repercussions. The way in which UDV does business, its production processes and distribution mechanisms can be used to make the company more sustainable. UDV has chosen this option and acted on a strategy of eco-efficiency in production processes. As a company it has an option not to choose the sustainable route.

Shell and BP are so heavily reliant on fossil fuel extraction that they can be perceived as inherently unsustainable. They need to diversify their businesses if they are going

to be perceived any other way. This indicates that businesses can behave in a sustainable manner and make themselves more sustainable even when their products are not sustainable. However to become a sustainable business companies will need to diversify their products and consumers will need to want a more sustainable lifestyle.

6.2.3.2 c Features of Corporate Competitive Edge

Some of the companies by nature of their business will gain competitive edge from the diversification or future markets offered by sustainable development options. For other companies this is not so, except at the basic level of efficiency improvements. For example, Shell, BP and ScottishPower all have the opportunity to diversify their businesses and generate energy from renewable sources. Technological developments too could alter consumer patterns and make the use of their products more sustainable. Smith Anderson has also taken advantage of the opportunity to diversify by introducing waste paper as a raw material. For UDV and Belhaven Brewery the changes that are open to them relate to raw materials rather than products. Here a change to, for example, organic crops is both risky as there is not enough information to support the genuine nature of organic crops or to identify the less genuine examples. This is also an expensive alternative to current arrangements.

In other cases improvements to corporate competitiveness will arise if people choose more sustainable lifestyles. This opens up the possibility that different sectors will start to compete with each other in terms of sustainable lifestyles, for example telecommunications companies with transport companies. This possibility however was not mentioned during the interviews, except where companies expressed a will

to have government promoting sustainable development more widely at the level of personal responsibility.

6.2.3.2 d Ability to become Sustainable: Socio-Economic

The ability of companies to become sustainable in the socio-economic sense is fairly complex. It is in part a value-based decision reflecting the perceived values of consumers as customers and potential customers. However it can also be a reflection of the company's locational ties and its dependence on local communities, as well as a reflection of the company's scope for investment and long-term view. The ability to become more sustainable in a socio-economic sense also reflects a corporate attitude to staff, to their retention and the importance placed on staff being proud to be associated with a company particularly in industries where the workforce is mobile and companies compete in a limited pool of resources for high quality staff. Lastly, the ability of a company to act in a sustainable manner in socio-economic terms reflects that company's adaptability to social pressures and in consultation the resources it is willing to put into gaining competitive edge when other, more simple competitive edge gaining means have been fulfilled.

The large companies interviewed have all made significant contributions to the people who work for them and to the people who live in nearby communities. Some companies have donated significant sums of money and also encouraged employee volunteering in a wide range of communities spreading the benefits to a wider range of people. All companies interviewed demonstrated some level of social responsibility driven by their stakeholders, whether staff or local communities, except Belhaven Brewery. However, BT, one of the largest donators is actively

encouraging increased use of its product and it is beneficial to do so over the whole of the UK, since it is promoting ICT as the solution to, amongst other things, rural exclusion. Thus BT is acting in a socially responsible manner because it is driven by an opportunity to develop new market potential. The range of companies and their products is neither comprehensive nor reflective of all the types of companies and services provided by corporate activity in Scotland. Thus to provide socio-economic development across all areas, and to all communities, a reliance on corporate sponsorship, engagement or partnership would be irresponsible. It would not reach areas where businesses do not expect to penetrate and the types of socio-economic activity would be limited.

6.2.4 Theme 4: Form and Effectiveness of Actions (Environmental)

Environmental action is strongly associated with implementation of sustainable development, as argued in earlier chapters. It is important therefore to gauge the private sector perspective on the extent to which environmental action is associated with implementation of and progress towards sustainable development.

Previous chapters have recognised that a lack of a holistic approach to sustainable development will hinder progress towards sustainable development. Sustainable development is about achieving a balance that considers both the needs of future generations and others in our own generation less able to utilise or access resources for development. Where a strong emphasis has been placed on the importance of the environment in delivering sustainable development, it is not the only area where

further improvements to current practice are required for nations, businesses and the world to become more sustainable. However the relative ease of implementation of environmental actions may influence approaches taken to other sustainable actions and increase understanding of sustainable development. In addition attitudes to and reasons for action on environmental issues for businesses may offer some insight into potential areas of further sustainable development action or attitudes to that approach.

6.2.4.1 Aspect of Research Interest

Firstly the effectiveness of the actions undertaken in making the company more sustainable is a key area of interest. Insight into this is gained from questions about the particular actions undertaken, their environmental and socio-economic outputs and the reporting and monitoring of those actions. Also of interest is the motivation to undertake these actions and the extent to which this encourages or facilitates further action on sustainable development, whether environmental or socio-economic.

6.2.4.2 Research Findings and Analysis

All the companies are involved in energy efficiency and waste minimisation as a basis for saving costs and improving viability of the company. All companies, too, are responsive to the Climate Change Levy and Packaging Waste Regulations that encourage more eco-efficient behaviour. Such market mechanisms and regulations have encouraged all companies to act on the relevant aspects of their strategies. A simple example of this in an SME company is outlined in Example 6.3 on Belhaven Brewery below. In this case a partnership and some financial support from the water regulator enabled Belhaven Brewery to make reductions in effluent disposal.

BELHAVEN BREWERY: ENVIRONMENTAL PROCESSES

A waste minimisation audit completed at the end of 1997 highlighted a cost of waste at £146,000 per year and identified potential savings of £31,000 per year. With the introduction of full effluent charges, resulting from new European legislative requirements, the brewery could potentially incur an effluent bill of over £250,000 per year. This gave the company a major incentive to reduce effluent charges.

The brewery has implemented a series of projects, most of which focussed on effluent reduction. However the introduction of a Combined Heat and Power (CHP) plant has also significantly reduced energy consumption. Measures focussed on effluent reduction include:

- Weak wort previously drained away (once it was too weak to brew from) is now being reused in the next brew cycle reducing the frequency with which the high effluent waste is drained away
- The cleaning cycle for vessels and pipework was reviewed to optimise the volume of water used, the time taken and the chemicals used at each stage
- Instigation of regular team meetings to raise awareness of waste minimisation efforts and highlight potential areas for further improvements
- Installation of new water/ effluent meters to give more accurate information on effluent loading from each part of the brewery highlighting further problem areas
- Installing the CHP plant has reduced the energy cost per barrel from £7.43 to £2.87 and reduced emissions by 42%
- Recycling of waste water from packaging plant
- Treatment of borehole water using reverse osmosis

Savings from these measures excluding the savings from CHP installation totalled £18,000 per year. Emissions of carbon dioxide, sulphurous oxides and nitrous oxides were reduced from 5,181 tonnes to 3,005 tonnes per year.

Example 6.3

Source: Interview with David Walker and George Howell, Belhaven Brewery

Measures implemented meant that the company avoided a significant increase in its effluent bill as a result of forthcoming legislation. The work undertaken in identifying these measures also raised awareness of other issues with significant benefits for the company in terms of water and energy savings. Some of the companies have extended energy efficiency and waste minimisation efforts further. For example UDV has not only applied waste minimisation efforts to the production process but also to the packaging and distribution of the product using glass bottles in response to the Packaging Waste Regulations. These have been redesigned to be lighter and lower in mass with thinner glass as indicated in Example 6.1 on UDV

earlier in the chapter. Installing more efficient technology as well as regular monitoring has improved efficiency of operations.

Other companies such as Shell, BT and BP have invested in research for technological development not to improve environmental impacts of their products but to create product diversification responding to the opportunity of new market potential. In BT's case that product diversification is aimed at making long distance communication easier reducing the need for travel. In the cases of Shell and BP the development of new technologies operating using cleaner fuels such as Liquid Petroleum Gas (LPG). ScottishPower does not undertake technological development but it is diversifying its raw material base from fossil fuel to increasing proportions of renewables in the raw material stream thus taking a more holistic approach life-cycle approach driven by the potential for creating new markets. All of these activities result in more efficient operations and reduced emissions. A consequent impact on productivity and market diversification shows this behaviour is competitive.

BT has made a number of significant environmental improvements and many of these have been openly reported since 1992. Over the past ten years energy consumption by the company has been reduced by 22% contributing to a 46% reduction in carbon dioxide emissions. Also BT has reduced the size of its vehicle fleet by a quarter over the past eight years and consequently achieved a 33% reduction in fuel consumption responding to the Climate Change Levy. A creative application of information and communications technology (ICT) has also reduced

adverse environmental impacts both for the company and its customers. For example, use of conferencing facilities has saved BT around 150 million travel miles in 2000/2001. Reduced commuting as a result of BT's teleworking programme is saving 424,000 car miles and 190,000 rail miles per week. The consequent impacts are reduced emissions and more productive working practices.

Railtrack have prioritised the environmental objectives of the company. These objectives are a mix of efficiency measures benefiting the company itself such as Environmental Management Systems, pollution management, resources and energy management. Other initiatives are aimed at improving the physical environment in which Railtrack operates (sensitive sites, contaminated land, visual impact) and also the environmental impact on customers and people near rail lines and affected by their use (communication, noise and vibration, network development). Yet more priorities tackle the relationship that Railtrack has with other organisations such as the supply chain and competence priorities. Railtrack is one of the few companies that addresses natural environment issues and is encouraging biodiversity.

ScottishPower undertakes a number of environmental initiatives aimed not just at efficiency improvements. For example the company has done a trial on the use of Dual Fuel vehicles (using Liquid Petroleum Gas, LPG) investigating their potential role in ScottishPower's vehicle fleet. The company has also installed a new energy monitoring system in Cockenzie Power Station, combined with conservation awareness and a new lighting system to reduce energy consumption at the plant. The company is also aware of its potential impact on biodiversity and has modified pools

in the Tongland fish pass to make the journey easier for migrating salmon. One of the biggest environmental impacts of ScottishPower behaviour is the renewables programme, where the company is actively increasing the proportion of renewable energy sources in its total electricity production portfolio, responding to the opportunity for new market potential and the business risk associated with not diversifying in the highly competitive energy production business.

In summary, the efforts made by companies to address environmental issues predominantly revolve around efficiency measures either during production processes or in the design of the product itself. Some of the large companies have invested in research for technological development to make products that will operate with less environmental impact than current products or designs. In other companies, realignment of business strategy or operations has also made significant efficiency improvements. Only in two companies is the issue of the natural environment and biodiversity addressed.

6.2.5 Theme 5: Form and Effectiveness of Actions (Socio-Economic)

Companies can have an enormous impact on the socio-economic well being of people all over the world. Companies have significant impacts on their staff such that at the simplest level companies offer access to jobs and incomes for people. Companies are also responsible for the workplace conditions of employees and the well publicised examples of sweat shops and child labour industries in developing countries are demonstrations of areas where companies are having a negative impact

on the socio-economic conditions in which people live and work. Companies also affect the socio-economic conditions of people living nearby. They can bring wealth to an area and can enhance infrastructure. In order to be truly sustainable, companies must address this aspect of sustainable development. Companies have the capacity to affect a much wider audience than just those in their locality. Their products can reach worldwide consumers affecting their lifestyles in an enormous range of ways. The products that those companies choose to produce can be said to establish particular lifestyles.

There are increasing examples of companies undertaking acts of philanthropy to groups of people through charitable donations, through grant schemes, through education and training initiatives and so on. In the case of larger companies much of this activity is reported through social reporting. It is of interest to gain some insight into the motivations and outcomes from these actions in relation to sustainable development and corporate branding and competitiveness.

6.2.5.1 Aspect of Research Interest

The types of actions that companies undertake in relation to socio-economic issues are of interest to this thesis. Specifically companies were asked about actions and prompted in the areas of:

- the extent to which companies use their resources to support the social and economic development of communities
- the extent to which a company contributes to the protection of human rights for its employees, its neighbours and all residents of countries where it operates

- the degree to which a company proactively strives to foster a high quality work environment and work-life balance for its employees (Sustainability, 2001)

The impacts of these actions undertaken by companies are also important in gauging the extent to which the actions described are effective in the intentions they are said to implement. The ability or willingness of the companies to undertake further action on socio-economic aspects of sustainable development is queried. Companies were asked to indicate what would motivate them to undertake further action in this area. The extent to which companies understand the links between socio-economic activity and sustainable development were also queried. The affect that this has on the corporate approach to sustainable development or the sustainability of the company is investigated.

6.2.5.2 Research Findings and Analysis

The findings from the interviews can be categorised into three distinct areas for analysis, and these are listed below:

a. Types of actions and impacts

b. Ability/ willingness to undertake further actions

c. Links to sustainable development

The following subsections present the analysis relevant to each of these areas.

6.2.5.2 a Types of Actions and Impacts

The types of actions undertaken by each business tend to reflect the nature of that business and varying extents of philanthropy with only a few companies exhibiting partnership approaches to the socio-economic dimensions of business operation. The smaller companies, Belhaven Brewery and Smith Anderson do very little in this area.

Belhaven Brewery did not note any socio-economic work at all. However Smith Anderson's attitude towards staff has changed in the past few years reflecting a more sustainable approach. Here a greater understanding of the need to retain skilled staff has led to increasing value placed on the workforce and improved efforts in training and personal development to reflect that. Smith Anderson also sponsored local events such as gala days thus contributing to a very localised and small-scale philanthropic approach. No targets or projected outputs were set. The lack of involvement from the small companies could reflect either a lack of understanding of what can be gained from socio-economic activities or a lack of resources to undertake such activities. The tone of the interviews suggested a mixture of both.

Railtrack and ScottishPower do work on socio-economic activities but these are direct impacts of their core businesses. Railtrack's approach to socio-economic elements of its business relates to safety, improvements to rail stations and a focus on disability and disadvantage. Safety is a key issue for Railtrack and in recent years this aspect of their business has been subject to strong public opinion and scrutiny following a series of fatal rail crashes. Improvements to rail stations are also part of Railtrack's core business although in reporting this emphasis is placed on integrated transport, access and personal safety. Railtrack also undertake some philanthropic work donating cash to charitable gifts, community and commercial initiatives. ScottishPower's approach is to firstly recognise its role in provision of basic needs: energy, water and sewerage. As such its core business provides a social need and could be described as socio-economically sustainable. ScottishPower also targets the low-income sector for fuel provision for a number of sound business reasons

BT: SOCIO-ECONOMIC ACTIVITY

BT is active in the three general areas of socio-economic development:

1. Community economic development partnership and corporate philanthropy
2. Human rights
3. Workplace conditions

Since 1996 BT has provided more than £75million in funding to schemes for social and community improvement. As a member of the Per Cent Club, BT guarantees to donate a minimum of 0.5% of its annual pre tax profits to not for profit causes. In 2000/2001 this commitment was worth £16 million and included direct donations to charity of £1.2 million. BT also provides additional funding and support in kind which in 1999/2000 was estimated to be worth around £20 million. As a global company BT supports a number of social investment initiatives around the world focussing primarily on the development of communication skills.

The community activities fall into four main areas:

1. Education: from primary schools to universities using a variety of techniques and media from live drama to web-based activities. For example, the BT Education programme helps to improve the communication skills of young people throughout the UK and offers on-line resource materials on ICT skills for teachers. The programme aims to reach one million young people in 3,500 schools. It is built around a touring "roadshow" visiting schools, offering drama presentations and communications skills workshops.
2. Charities and Fundraising: BT supports a range of charities such as the Telephone Helpline Association, Childline and the Prince's Trust. The Prince's Trust provides New Deal Training, thousands of young people participated in the scheme and 21 directly found employment in BT through the programme. BT makes awards of new technology to groups of individuals who illustrate how gaining access to email and the Internet could benefit their community. BT also supports various events to encourage fundraising such as BT Swimathon that raised over £14million in 11 years for 39 different national charities.
3. Volunteering: many employees of BT are encouraged to volunteer with causes they choose and can be given paid time off where agreed by their line manager as part of their personal development. BT also supports the Timebank, which encourages individuals to get involved in the local community by donating their time to community activities.
4. Arts and Heritage: BT supports the arts believing it to be one of the most powerful and enduring ways in which people have communicated feelings, ideas and emotions.

Human Rights: BT has based its people policies and procedures on the Universal Declaration of Human Rights adapting them to integrate the UK Human Rights Act. Recognising that not everyone who works for BT does so as a direct employee, BT aims to ensure that the working conditions in its supply chain meet standards based on the Universal Declaration and International Labour Organisation Conventions. BT has established Sourcing with Human Dignity, a supply chain initiative which seeks to promote these universal standards to BT's direct suppliers and gain their support in advancing them throughout the supply chain.

Workplace Conditions: BT strives to:

- Create an open, honest, unprejudiced work environment that encourages people to achieve full potential
- Value people's individual and team contributions and offer opportunities to share in the company's commercial success
- Recruit, employ and reward on ability and contribution
- Provide opportunities for personal growth and professional development
- Communicate and consult with employees in appropriate ways
- Promote a healthy lifestyle

Much of the success of this approach can be quantified by reference to CARE 2000, BT's Communications and Attitude Research for Employees Survey. All employees are given the opportunity to complete the survey. Feedback from the survey is used in teams to formulate action plans to improve employee satisfaction. A key measure of the survey is the People Satisfaction Index (PSI) which was 65 for CARE 2000. The PSI target for the next CARE survey is 67.

Example 6.4

Source: BT Website

including working with a potentially loyal and distinct market group. The company

has thus tailored services to ensure it can meet the needs of this group.

Shell and BP have fairly well developed socio-economic portfolios of activity. In each case the public perception of events such as Shell's involvement in Nigeria and the disposal of the Brent Spar has increased the risk the business and has led to board level decisions to become more proactive about environmental and socio economic activities[48]. Both companies have well-developed policies on human rights reflecting international regulations. In terms of workplace conditions both companies are starting to involve their employees in corporate policy. Much of this effort at engagement with staff relates to personal values and seeking ways in which employees can be engaged making them proud to work for their company. Again the business case is strong. In BP business units compete against each other and staff are encouraged to work together with various schemes to reward people and a yearly share gain at each business unit encourages team working and innovations in efficiency improvements. In both BP and Shell there is an understanding that there has been a cultural shift in society, which both companies are trying to work with and encourage in their own operations. This is the bottom up approach, allowing staff to influence decision-making through incentive schemes and staff surveys.

BP and Shell are both involved in community based work to some extent in areas local to their operations. For example Shell has supported the refurbishment of a site it owned and operated which was due for review. Ultimately the site now is home to

---

[48] For more information see http://www.pirc.co.uk/shelldec2.htm

150 Small and Medium Sized enterprises employing around 1000 people and the site has built links with chambers of commerce, local schools and colleges, business clubs and local towns and parishes. Shell and BP each operate a range of measures, some site specific and some national:

- involving consultation with communities on new developments,
- provision of fuel services to remote rural communities,
- offering financial incentives to employees engaging in voluntary activities,
- sponsoring specific campaigns,
- supporting young entrepreneurs, and
- assisting with education with a sustainability and energy focus.

No targets or outputs are set or projected in this area except in relation to Health and Safety.

UDV's and BT's efforts in socio-economic activity are even more comprehensive than those efforts described above. In UDV's case, as outlined in Example 6.1, more involvement and long-term partnership with a community on a particular location has brought long-term benefits to the island. UDV has expressed its interest in community involvement as one of enlightened self-interest whereby the length of maturation of the malt whiskey product requires a stable population to work in the industry. In addition that industry requires a particularly robust infrastructure and in the case of Islay, improvement of the infrastructure could be enhanced by community involvement.

BT undertakes a range of activities as described in Example 6.4, labelling itself as a member of the Per Cent Club meaning that BT guarantees to donate a minimum of 0.5% of the company's annual pre tax profit to not-for-profit causes. BT supports a number of social investment initiatives around the world focussing primarily on the development of communication skills. Again, while the benefits of BT's role in socio-economic issues are significant, the efforts are aimed at core business activities. BT's activities demonstrate a commitment to staff development and a good working environment, as well as human rights: an approach the company has extended to its suppliers. The scope of BT's activities is far-reaching and captures a wide audience from schools, to charities, volunteers and arts enthusiasts.

These examples demonstrate how BP, Shell, UDV and BT are each motivated to act on their corporate strategies by their stakeholders. In effect few of the corporate socio-economic activities are measured quantitatively (because that is very difficult and activities are extremely diverse) and targets are not set. The exception is for staff surveys where companies set quantitative targets and measure progress such as BT's People Satisfaction Index.

To summarise socio-economic activities are centred around core business and ways in which companies can retain or increase market share, retain staff for production and enhance staff capabilities and understanding. For example in relation to staff, the measures described are recognised by the companies interviewed as having the effect of increasing innovation and making employees proud to be associated with the company thus reducing staff turnover. Both are valuable to corporate

development in terms of remaining competitive both in the quality of services or products and the quality of staff developing and delivering those services or products.

Where efforts are not directly related to core business, they are related to public perception. This is an unsurprising result. However it does highlight a shift in attitude for businesses and an increased corporate understanding of the importance of the public and sometimes of local communities in their competitiveness. It is possible that the increased interest in public perceptions and local community interests reflects a growing body of evidence supporting the role that such efforts have in creating new consumer groups and markets for existing products as well as generating market research to inform development of new products. Community development work tends to be both highly locational and directly related to core business. Efforts in this type of work can have the benefit of enhancing public perception of the company both locally and with a wider audience but also contribute to the creation of markets through understanding potential and existing needs better.

6.2.5.2 b Ability/ Willingness to Undertake Further Action

In general the larger companies were the ones that understood the potential benefits for competitiveness and had the resources to pursue this kind of activity. It may be that smaller companies understood the benefits in theory but did not perceive sufficient benefit based on economies of scale to pursue this type of activity beyond simple donations or staff training activities. As actions become larger the costs of implementing them increase and the relative merits of the impact of socio-economic action could be small for a small company with a low turnover and a corresponding

lack of resources. Motivations for increased activity were a reflection of impact on the bottom-line, scope for market development, impact on customer loyalty and branding and retention of highly qualified and skilled staff. Changes in culture and behaviour of existing and potential customers might motivate further action in socio-economic activity.

6.2.5.2 c Link to Sustainable Development

The companies that have well-developed socio-economic activities as described in this section have been active in this area for many years. Increased individual or governmental interest or activity in sustainable development did not promote the activities described earlier in this section. Despite this the companies interviewed are aware of the links to sustainable development, offering further evidence of the high level of understanding amongst these companies of sustainable development. This demonstrates that some companies do take their socio-economic impacts into consideration as a result of their understanding of the impacts and of the potential to make their own business more competitive where this activity is closely related to market development or core business marketing and diversification.

6.2.6 Theme 6: Integration of Sustainable Development and Competitiveness

This theme covers two particular aspects of integrating sustainable development and competitiveness: corporate governance and engagement.

Corporate governance is about the way in which corporations manage themselves and fully incorporates a company's approach to risk management. Risk management

and the corporate approach to it is a clear indication of the way in which a company perceives a number of factors affecting the business including sustainable development. Increasingly companies are under pressure to ensure that they have clear and robust internal controls on risk from shareholders. The Institute of Chartered Accountants in England and Wales has published a Combined Code of The Committee on Corporate Governance (ICAEW, 2000). It was agreed by the London Stock Exchange to meet the principle of the code in that the Board of any company should maintain a sound view of internal controls to safeguard shareholders investment and the company assets. Interestingly the code also makes reference to a need for consideration of sustainable development. The Code is currently a voluntary code with guidance aimed at encouraging good practice.

Corporate governance is significant area of interest in relation to business activities and as indicated above its scope is very broad and predominantly about financial management and risk. This topic is too extensive for adequate coverage in this thesis, however the elements of corporate governance that are of interest here relate to sustainable development. Thus corporate approaches to corporate governance are important because they will in part reflect a corporate view of the risk associated with sustainable development to their company. The risk can be a reflection of many factors including public opinion, direction of government policy and financial aspects relating to resource supply and demand.

There are two key factors of corporate governance, which relate to sustainable development generally. These are the ethics, values and principles which a company

uses as the foundation for its decisions and operations and the accountability and transparency with which a company reports its business (Sustainability, 2001). As well as the general issues there are company specific issues, for example in the case of energy where well documented and researched issues exist over the life of natural fossil fuel supplies and the issues around carbon dioxide emissions and its effect on global weather patterns. Such trends can be perceived as a risk to a company that has significant interests in fossil fuels.

Sustainable development needs to be delivered by all. It is so far reaching and so complex that no one group or government or agency could possibly effect its progression without the support and involvement of all other groups. Those groups listed in Agenda 21 include business and industry, farmers, the scientific and technological community, women, children and young people, workers and trade unions, local authorities, indigenous people and their communities and non-governmental organisations. It is important to understand the effect and the potential of this particular major group, business and industry, in progressing sustainable development. Agenda 21 advocates high levels of democratic accountability encouraging people to participate in decisions which affect their lives. Companies can make these decisions as well as governments and so the extent to which companies identify and fulfil this responsibility is also of interest.

For the purposes of understanding how business can be sustainable the interpretation of engagement is a reference to a process of understanding the views, concerns and values of stakeholders in the business. Stakeholders are defined as any group or

individual who can affect, or is affected by, the achievement of the organisation's objectives (Freeman, 1984). Stakeholder engagement is an important aspect of delivering sustainable development because it opens up the process of delivery to a wide range of views allowing involvement of all stakeholders in expressing opinion and influencing the actions taken and the ways in which they are delivered. It also increases empowerment of stakeholders and offers a more holistic view of all the impacts of particular ways of operating allowing better understanding of the full range of impacts of business operations. Business relies on satisfying consumer demands and if these are sustainable demands, whether for consumers or the supply chain, then business will become more sustainable by a process of engagement to get an accurate picture of these demands.

6.2.6.1 Aspect of Research Interest

Given the high importance that companies attach to risk management in developing corporate strategies, it is interesting to explore whether or not companies have made the connection between sustainable development and risk. If so, it is also of interest to find out how that knowledge has been applied in making the company either more sustainable or less at risk. The questions asked during the interviews explore the companies systems and controls and reporting procedures and the extent to which these incorporate aspects of sustainable development. In addition the features of the business which give a competitive edge and the interviewees perception of that can provide some insight into where risks lie with the company. The nature of the company itself and its approach to risk also offers some understanding of the future potential of corporate governance in making companies more sustainable.

To simplify the analysis of the actions taken by companies in relation to engagement, two categories of stakeholder engagement have been identified. These are business partners and non-business partners. Business partners are those companies or other organisations which business works in partnership with to deliver its core business. This could be suppliers, joint venture partners, contractors, shareholders or customers. The questions were aimed at finding out the extent to which the companies try to engage with these groups with the aim of becoming more sustainable. For example companies could screen their purchases in order to become more sustainable, or ask that their suppliers behave more sustainably and seek ways to influence that behaviour. Companies could also promote higher standards of operation within the industry and adapt to meet more sustainable customer preferences.

The other stakeholder group of non-business partners could include government and non-governmental organisations as well as people who are not business stakeholders in the company such as potential customers or communities based in the vicinity of business operations. In this case stakeholder engagement might be judged against the quantity and quality of engagement exercises such as consultations, and the perception of such stakeholders of the company as well as the extent to which the outcome from such exercises are reported and acted upon.

6.2.6.2 Research Findings

There are five specific aspects of research that were explored in relation to this theme. These are:

a. Ethics, values and principles

b. Accountability and transparency

c. Future potential

d. Engagement with business partners

e. Engagement with non-business partners

Research findings for each of these topics are described and analysed in the following sections.

6.2.6.2 a Ethics, Values and Principles

None of the companies interviewed bases its business strategy on sustainable development. However to varying degrees sustainable development does have an influence on the precise course of each of the large company's business strategies. Neither of the two smaller companies made any association between corporate governance and sustainable development except in the sense that they had each engaged in environmental efficiency improvements with the objective of reducing overhead costs and consequently supporting the continued existence of the business in a highly competitive business environment.

Each of the large companies has a slightly different approach to sustainable development and its meaning in terms of sustainable corporate governance. In general the approach taken is directly related to areas where each company perceives a risk to the business which can be mitigated to some extent by taking a more sustainable approach. In no case is sustainable development itself the motivator to change the corporate approach.

For UDV the drivers have been cost and increasingly costly and stringent legislation. The Packaging Regulations and projected increases in Landfill Tax Levy rates as well as water charges have pressured the company into seeking efficiency savings. Railtrack is a company that needs to raise finance to undertake developments, enhancements or extensions of its business largely from the public sector. The corporate share price is affected by public perception and the company is currently in a fragile position following a number of fatal rail crashes. Railtrack sees sustainable development as a potential way to enhance financing bids for development of operations and infrastructure with public sector partners by demonstrating social and environmental benefits where the economic benefit is zero or marginal, thus potentially jeopardising the projects. Railtrack perceives sustainable development as a means to enhance its competitiveness in partnerships with the public sector. Equally the company believes that pursuing sustainable development activities may generate a more positive public image.

In BP there is a very strong link between sustainable development and the public image of the company. The company wants to be perceived as a "force for good", enhancing quality of life. To some extent this is a reaction to the negative impact of environmental campaigns such as that targeted at Shell during the disposal of the Brent Spar and the human rights issues arising in Nigeria. BP sees itself as a potential victim of similar campaigns. The approach can also be interpreted as a long-term market positioning in response to increasing rarity of fossil fuel sources and improving public opinion of renewable energy.

SHELL EXPRO UK: CORPORATE REPORTING

Shell's perspective on sustainable development is that the concept is the right approach because values and principles are important to the company and implementing sustainable development makes good business sense. Shell sees that its success as an organisation is intimately linked to that of society. By maintaining and enhancing natural and social capital as well as contributing to the global economy's capacity to generate and distribute wealth, Shell can act out its role responsibly.

To implement sustainable development Shell has developed some key management tools. These are summarised by the following list:

- Setting standards;
- Introducing and working with business systems;
- Setting and working to meet targets;
- Working in a framework of continuous improvement;
- Reporting on progress to stakeholders;
- Engaging stakeholders both internally to the company and externally.

Some key points to note from the systems and procedures established by Shell are as follows:

- Minimum environmental expectations have been set some of which are targets and others are current practice;
- Co-venture partners and contractors are expected to operate in a manner compatible with Shell's principles as they relate to the way work is done. Contracts have been terminated in situations where operations are inconsistent with business principles and some suppliers are being helped by Shell to meet the required standards;
- Employees are valued and their views are welcomed and listened to by the company through a staff survey. Innovation and new approaches suggested by staff are encouraged and practical ideas worked up.
- Stakeholder involvement is encouraged through website development and dialogue events with local communities;
- Community activities in the UK include support to charities, support for young entrepreneurs, development of education materials and encouragement of local community activity.
- Environmental activities undertaken by Shell include reduction of carbon dioxide emissions, development of renewable energy technology, improving environmental performance of existing operations, improving safety in new and existing operations, development of low and zero emissions fuel technologies, promotion of cleaner fuel use and reducing waste.

Corporate reporting is also a feature of the systems utilised by Shell with a range of annual publications clearly stating approaches, goals and progress.

Example 6.5

Source: Shell, 2001a and Shell, 2001b

BT views sustainable development as an area for continual improvement. It does not see that there is any endpoint to the pursuit of sustainability. BT however is in the position of promoting its product, to some extent like Railtrack, as a solution to the problems inherent in being unsustainable. Therefore BT will promote debate and consideration of the role of ICT in becoming more sustainable.

Shell and ScottishPower are the two companies interviewed that appear to have really built consideration of sustainable development in their risk management strategies. Shell has done so by making the decision at Board level to take sustainable development and environmental and social campaign issues into consideration during project development. This follows some very costly and damaging public relations incidents, mentioned earlier, which severely affected Shell's share price during the mid 1990's. The main ways that Shell has addressed this are by embedding ethics, values and principles into corporate reporting, strategy development and supply chain purchasing of goods and services (see Example 6.5 on Shell for more information).

ScottishPower both recognised a business risk in not being more sustainable and decided to be proactive using sustainable development as a business opportunity and build its business strategy to firmly incorporate sustainable development principles. As a company which provides basic needs through energy and water supply ScottishPower sees itself as being in an easy position to work this way compared to many other sectors and industries (Example 6.6). The example of ScottishPower is the closest example amongst those companies interviewed of a company adopting sustainable development principles as its core business strategy. Certainly the long-term view of ScottishPower appears to give strong consideration to this, although current operations still have a heavy dependency on fossil fuels.

SCOTTISH POWER: RISK MANAGEMENT

ScottishPower is an industry leader in the development of environmental governance practices as recognised through the recent award from ACCA (The Association of Chartered Certified Accountants) for the 1998-99 Environment Report. The company employs various techniques and tools to provide control and direction of environmental aspects of the business. These key elements are:

- Stakeholder research to inform management priorities;
- An annual assessment of business risk arising from environmental issues reviewed by an authoritative and independent third party
- Active management of business risk through the implementation of externally verified Environmental Management Systems frequently certified to ISO14001 at an operational level;
- Active foresighting and management of cross business risk through the work of ScottishPower's Environmental Policy Advisory Committee (EPAC) and the Corporate Environment Director;
- An environmental governance review to check the direction and control of environmental issues conducted annually by an independent third party;
- Measurement of performance against Key Performance Indicators which measure progress against strategic goals and business level objectives and targets, controlled by EPAC; and
- Accounting for environmental performance to stakeholders through the publication of the Corporate Environmental Report.

ScottishPower has set clear goals relating to sustainable development and its business. These goals include:

- Having at least 10% of generation from renewables by 2010; at least 400M capacity by 2003;
- Generating 10% of the energy portfolio from Combined Heat and Power by 2010; and
- Cleaning up all remaining coal fired power stations by 2010.

The company has set Key Performance Indicators that align with and map progress towards the corporate strategy for delivering sustainable development. These indicators are now also presented in terms of their relationship to the UK government's headline indicators for sustainable development. This demonstrates the capability of the company to make a substantial contribution to meeting the UK strategy through a commitment to directly aligning management goals and processes to achieving sustainability goals.

Example 6.6

Source: ScottishPower, 2000

6.2.6.2 b Accountability and Transparency

All the companies, except Belhaven Brewery and Smith Anderson, have set specific targets for the actions they have identified and are undertaking. In their case, environmental improvements are measured in relation to water quality and flow as required by legislation and tools used by their regulator have motivated this reporting. All companies other than Smith Anderson and Belhaven Brewery have

published environmental reports to demonstrate this good practice. In some cases environmental reports have been published for many years, for example BT has published one annually since 1992. These reports are all available through the company websites[49]. There is a variety in the range of targets set by each company. All include carbon dioxide and energy reduction. Some targets are set over long time periods such as BP's 50-year vision and others set targets for monitoring at regular shorter intervals, such as ScottishPower's annual performance indicators measured to ensure progress towards two to five year targets. Setting long-term targets and visions for environmental improvements reflects a longer term approach to energy management by these big companies showing that these companies are not just interested in sustainable energy management for the immediate cost savings it brings to their companies.

Many, but not all of the companies have recently started to publish social reports or sustainability reports incorporating social aspects of performance into extended environmental reports. For example BT published its first social report in 2001, BP has been publishing country reports incorporating environmental and social performance for Scotland for a few years. Railtrack extended its environmental report to include social performance in 2000 and Shell produces a family of reports offering country specific and worldwide information on social and environmental performance. UDV is the only large company interviewed which does not currently publish regular reports except for some web based environmental targets but is

---

[49] The addresses are listed in Appendix Three

considering doing so, and BP is considering extending its report to include fixed targets and measures and publish it as a sustainability report.

The motivations for each company to publish reports are similar to company motivations for turning strategy into action. Thus Railtrack, Shell and ScottishPower were motivated by business risk and BP, BT and UDV were motivated by new market potential.

As noted above not many companies have yet built full consideration of sustainable development into their risk management strategies. Belhaven Brewery, Smith Anderson, UDV, Railtrack, BT and BP are all undertaking actions that have been described in earlier sections. Shell has started to operate a comprehensive sustainable development management system described in Example 6.5 earlier thereby developing a tool to increase corporate accountability. ScottishPower too has produced a comprehensive and highly accountable system based on a combination of values relating to renewable energy, social/market understanding based on public perception of energy sources and new technologies and government policy direction. This is also described more fully in Example 6.6 on ScottishPower earlier.

6.2.6.2 c Future Potential

Many of the companies interviewed are showing signs of increasing their potential in pursuing sustainable development via corporate governance. Railtrack for instance is changing the way it works in partnership in order to, in part, enhance/ improve aspects of its business which give the company a negative public image, such as

safety, noise, litter and vibration. BP is investigating potential of setting targets and reporting on sustainable development by way of becoming more accountable and reinforcing the company's target image as a company that improves quality of life. BT has started a new programme aimed at making its suppliers more accountable and ethical in relation to human rights. UDV is considering extension of its community role in other areas. In the cases of Railtrack and BT, these actions can be described as business leadership motivated by risk and market potential in turn. BP and UDV's aspirations could also be described as business leadership once they are implemented.

In each case potential exists to improve the corporate governance of the company in a more sustainable way. In each case, the proposed actions enhance the image of the company in the UK and for BP, BT and UDV that is also true internationally. With increasing consumer awareness of such issues, it is likely that more pressure will come to bear on these and other companies which wish to enhance their brand image and market profile. It is interesting that in all cases energy is a key factor given the widespread understanding of energy production and use and its relationship to climate change. A similar pressure has been applied from government for the same reasons with negotiations on climate change, introduction of the Climate Change Levy and increasing pressure to reduce energy consumption. Potential for solutions to sustainable development, in this the strongest aspect of business strategy will arise with sufficient public pressure and government pressure combined. All companies cited the Climate Change Levy as a driver for enacting their strategy.

In summary, although no business bases its strategy on sustainable development principles there are elements of the ethics, values and principles of sustainable development being taken into account by the big companies. The extent of this varies significantly from enhancing public image to an argument for a corporate strategy at ScottishPower. Companies address accountability and transparency issues mainly through setting targets and reporting on them. However, where fairly comprehensive reports are prepared in relation to resource management, and specifically energy and waste, the scope of reporting on natural environmental impact and socio-economic activities ranges from non-existent to patchy at best. Companies are all planning to address accountability and transparency further and as more reports become available and get scrutinised by non-business stakeholders, the pressure to improve quality of activity and report on that, will grow. Sustainable Corporate Governance offers great potential for making business more sustainable.

6.2.6.2 d Engagement with Business Partners

There is a real diversity in the breadth of engagement that the companies pursue. For example Smith Anderson engages with other local paper manufacturers buying their waste as a raw material. BT, as a large international company, started a supplier initiative on human rights in 2001, encouraging and supporting its suppliers to operate good practice in human rights. It is also involved in a network of telecom operators in regard to environmental issues. Shell does some work with contractors, encouraging them to be compatible with all of Shell's values, thus drawing out human rights, attitudes to staff and environmental issues. BP takes a thorough approach to engagement with business partners through encouraging a bottom up approach to strategy and its leading role in the industry sector strategy group now

looking at sustainability (United Kingdom Offshore Oil Association (UKOOA)). Railtrack relies on a wide range of contractors and suppliers to operate its service and as a previously regulated body has to operate these relationships under tightly controlled and sometimes restricted contracts. Railtrack is making efforts in applying these contracts more on the basis of partnership.

Certain companies have pursued engagement with business partners fairly vigorously. In particular the initiatives with supply chains show a high level of commitment to this sort of engagement. These companies (BP, Shell, BT and Railtrack) all have a strong policy on creation and maintenance of a good public image. It is possible that supply chain initiatives are perceived by these companies as being good in the public eye.

A supply chain approach like Shell's for example, checking that suppliers meet the buying company's own values can have enormous benefits in terms of sustainable development. It proffers a cascade effect whereby hundreds of, often local, suppliers are encouraged to think and act more sustainably in order to retain their supplier status to a multinational company. The limitation here, in terms of sustainability, is the scope and range of suppliers involved. It perpetuates existing industry but does not necessarily attract new big business. However it could develop, enhance and even create new small to medium sized enterprises to meet needs of large multinationals. The challenge for multi-national companies is to be thorough with this approach as it could be resource intensive.

There is little to measure the impact of engagement with business partners. None of the companies interviewed are currently reporting on the impacts of supply chain initiatives. There is no information readily available to identify suppliers and consequently it is difficult to directly approach such companies to determine the impact of the supply chain initiatives described earlier in this section.

6.2.6.2 e Engagement with Non Business Partners

Again there is a real mixture in the extent of engagement by companies. The smaller companies have not engaged with any non-business partners at all except Smith Anderson sponsoring local gala days and competitions. BP engages effectively with non-business partners as outlined in Example 6.7. This example demonstrates the wide range of partners with which BP engages and gives examples of some of the community and the corporate benefits resulting from that engagement. Shell has seen the benefits of engagement with local communities. For example in Fife at Shell's Natural Gas Liquid Plant, a public consultation has improved the environmental performance of the plant following investment in a Vapour Recovery Unit. Also at that plant there is improved flaring performance and management of the land around the site as a result of responding to the community's environmental concerns. Shell's experience during the decommissioning of the Brent Spar have led the company to focus on open and transparent reporting and early engagement of stakeholders in developing new initiatives and reviewing existing operations. BT has prepared their first report to society in 2001 and has invited comment from all interested people.

BP AMOCO: ENGAGEMENT WITH NON BUSINESS PARTNERS

Until the early 1990's corporate citizenship in BP had been seen as synonymous with community affairs. It was handled as a corporate issue rather than by the business units and it tended to be treated as an aspect of external relations. Changing perceptions and conditions during the 1990's brought about greater business unit ownership of community relations, as well as more variety in its practice.

BP produced its first international community report in 1995. By 1998 the publication of BP's third report - it's first social report – the company had broadened its definition of social performance to include:

- BP's behaviour, as circumscribed by its newly published business policies on ethical conduct, employees, relationships, health, safety and environmental performance and finance control.
- BP's impact, both positive – such as wealth creation – and negative – the cultural and social consequences of BP's presence.
- BP's social contribution – not just to community projects, but skills and technology transfer, for example.

Business line managers now had the key role in implementing these policy commitments.

BP states it believes that long-term relationships founded on trust and mutual advantage are vital to BP Amoco's business success. A key measure that BP has set itself is the way stakeholders judge BP's activities. Thus views are sought through attitude surveys of the public and special interest groups. Each year BP invites Scottish environmental, community, local authority, government, academic and business representatives to a forum in Scotland to comment on BP Amoco's environmental and social impacts and how BP can improve. In response to a challenge from one such forum, BP now produces an annual "Report to Scotland" reviewing activities in Scotland and how they have impacted on the country's economy, environment and communities.

BP recognises that social performance, the way the company behaves, the impact of operations on people and their overall contribution to society, is subject to rising levels of expectation from the public. To help deliver these expectations BP has introduced a new strategy for community investment programmes, a major initiative to establish a new and strategic use of investment to support positive social performance. The strategy includes both innovative local community investments where BP has business operations and a global programme of support for employee involvement in the community.

BP Amoco invested £1.5M into community programmes in 1999, rising to £2.8M in 2000. The company operates a range of schemes that address community issues such as education, training and business development with a range of appropriate partners. The schemes include:

- Schools Link Scheme, where employees are partnered with schools to support education/ industry initiatives
- The Scottish Forest Alliance in partnership with a range of organisations to plant trees in Scotland which can be managed for biodiversity enhancement and community involvement
- Dynamic Youth providing young people with the opportunity to develop skills such as team working, leadership and project management
- Development of a Community Enterprise Partnership to promote the growth of local business start ups that pursue a technological or environmental theme
- Helping Hands and Matched Giving programmes encourage BP employees to offer their time talents to support community activities
- Regular meetings with 20 community councils in and around the Grangemouth complex hearing issues and concerns from the local communities and encouraging them to discuss activities and organisations they would like BP to support
- The "Read On" education project sponsoring students to tutor projects which are designed to motivate school pupils to continue their education.

Example: 6.7

Source: Interview with BP and BP website

Overall some of the bigger companies which have significant potential problems

with negative media have become aware, like Shell, that they need to be more open about their activities and to consider what people want. The motivation for non-business partners' stakeholder engagement may just be about avoidance of costly adverse publicity but the outcomes can be sustainable. For example Shell found a delicate cold water coral growing on the Brent Spar, previously only thought to grow in deep water west of Britain and Norway and avoided destroying it following engagement with an environmental pressure group and thus contributing to biodiversity.

To summarise, efforts in engaging business partners are more extensive than those engaging with non-business partners are. The efforts to engage with business partners are frequently aimed at the supply chain, thus having a wide-ranging impact. The business case for such engagement is in part about building up a reliable and good quality supplier base but there is also an element of public perception influencing the decision to encourage suppliers and other partners in basing decisions on the ethics and values of these major companies.

Engagement of non-business partners appears to be entirely focussed on creation of markets and enhancement of public image. The companies appear to want to hear people's views of the organisation and its decisions and activities. However there is little evidence to show how companies take account of these views once sought in affecting core company activities. The outcomes focus around increasing community and philanthropic activities and sometimes in increasing accountability and contributing to natural environment conservation.

6.3 Discussion

The business and industry sector is undertaking a variety of activities that could be described as contributing to sustainable development and with many of the companies interviewed having a view to their long-term future, the potential for becoming increasingly sustainable exists. The companies interviewed offered information on:

- their view of the level of influence government has on their activities,
- their own understanding on sustainable development,
- the company's ability to undertake more sustainable activities,
- the kinds of activities they currently undertake and their outcomes and
- the potential for integrating sustainable development and competitiveness.

The types of activities that the companies are involved in are:

- engaging partners
- developing vision and strategy
- reporting
- turning strategy into action through target setting and implementation
- eco-efficiency processes
- focussed engagement with business and non-business partners
- accountability through reporting on targets or engagement
- making products more eco-efficient through changes to product life cycle
- developing new products and creating more sustainable markets
- being socially responsible

- taking a role in business leadership to encourage other companies to become more sustainable
- undertaking natural environment conservation

As noted in the introduction to this chapter it is of particular interest to understand what motivates corporate behaviour in relation to sustainable development. The kind of drivers and supports for action taken by the companies interviewed are as follows:

- Regulations
- Market mechanisms
- Business risk
- Stakeholders
- Potential to develop new markets
- Global trends
- Partnerships
- Grants
- Knowledge and Information
- Tools

Specific drivers and supports motivate specific actions and this relationship is presented in Table 6.2 below.

Regulations and market mechanisms are having some impact on corporate behaviour in the companies interviewed. In particular they encourage engagement with potential partners at a stage where companies are not sure about the full implications of the regulations or market mechanisms. They are particularly strong on

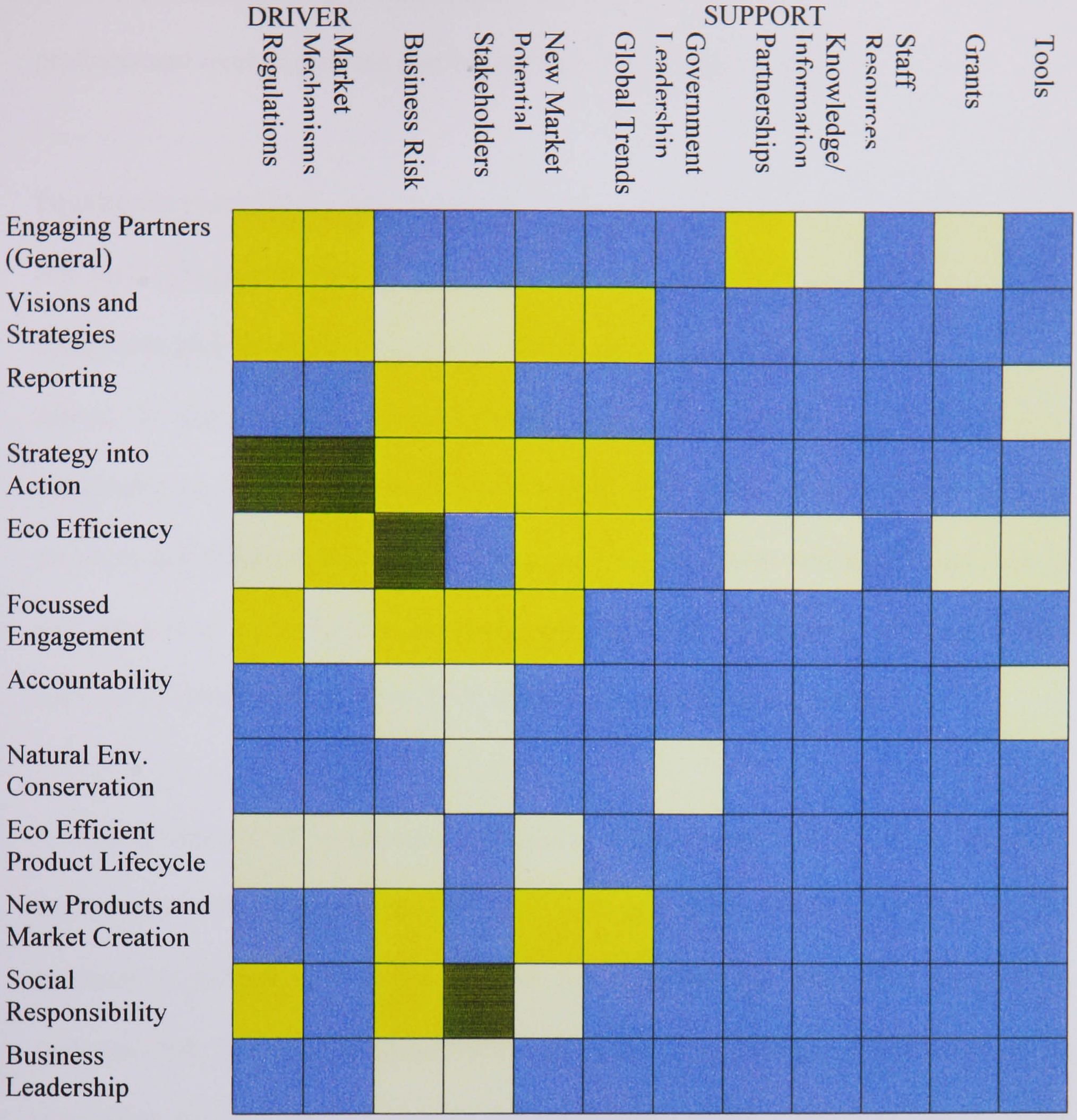


Table 6.2: Private Sector Sustainable Competitiveness Matrix

encouraging more eco-efficient behaviour and encouraging strategy into action where strategy relates to efficiency. Where companies take a proactive stance, the impact of regulations or market mechanisms can contribute to corporate vision and

PAGE

MISSING

IN

ORIGINAL

stakeholder demand is not encouraging more eco-efficient product lifecycles or new products and market creation that leads to more sustainable lifestyles.

Equally the potential for new market development is often a means of addressing risk and such opportunity for innovation has been successful particularly for some of the companies interviewed in developing new visions and strategies and turning that into action. In addition this is an area where innovation is most likely to create a more sustainable company. This particularly relates to the effect of new market potential on more eco-efficient lifecycles, new product development and market creation as well as a need to look to more social responsibility, particularly relating to local community development, whether directly or through focussed engagement.

A further impact of companies' efforts to address risk can result in increased engagement with stakeholders in an effort to become more aware of the risks that the company is subject to. In the case of the multi-national companies interviewed corporate risk has become associated with social responsibility particularly where companies can be perceived to be abusing human rights. This has led to action directly by the companies to address social responsibility as well as enacting business leadership to remove association with suppliers that may be acting in an irresponsible way.

The business operations can reflect whether or not a company perceives itself to offer products that offer more sustainable lifestyles, such as BT replacing travel with ICT solutions. The alternative is a company that offers products that are inherently

unsustainable, such as Shell or BP with a heavy reliance on fossil fuels as their core business. A key factor that will influence whether or not real change in business products or services is possible here is that of consumer demand. It is possible that increased demand for more sustainable lifestyles could result in a change to the way that companies compete. Companies could start to compete on the basis of service rather than product. For example, an ICT company competes with a travel company to offer a service about people meeting and communicating with one offering capacity for interested parties to remain in their original locations and the other offering the opportunity for the interested parties to travel to meet face to face.

For the SMEs the business risk relates to the impact of increased costs associated with forthcoming legislation and related charges and the measures to address that are increased efficiency of existing operations. The main stakeholders for these SMEs are staff and the companies have an interest in retaining skilled staff, which has the impact of the company being more socially responsible. New market potential is again about diversifying products to retain a competitive edge. In one case the SME interviewed addressed this by using waste paper as a raw material to diversify into making paper bags having the impact of creating a more eco-efficient product lifecycle and at the same time diversifying and creating new products. Again this was a development that arose from corporate risk since the market for paper products was increasingly competitive and the company was in a difficult position. In the other SME case the product diversification was not motivated by sustainable development nor did it have any sustainable benefits.

6.4 Conclusions

The companies interviewed are engaged in a diverse range of environmental activities that extend well beyond eco-efficiency. This contradicts the commonly perceived and limited view that companies will only undertake efficiency activities in regard to environmental responsibilities. All companies interviewed have implemented efficiency measures, particularly in regard to water charges and energy costs. However other activities include biodiversity, land use issues, visual and noise impact, new product and market development and conservation of some resources by materials substitution with renewable energy. All of these measures are aimed at increasing competitiveness by making the product or service more attractive and desirable to use and by gaining competitive advantage in new markets.

The strongest drivers for sustainable business behaviour are risk and stakeholders with new market potential also creating a strong driver. The influences of risk, stakeholders and new market potential have more significant impacts on corporate sustainability in the larger companies. The same factors relating to improvements in efficiency, staff retention and skills development, an eco-efficient product lifecycle and new product and market creation apply. However in addition to these outputs, business risk has created a momentum in terms of developing visions and strategies in business as well as reporting where there is a risk that a lack of reporting will be perceived by stakeholders and consumers as negative, uncaring or unethical. By the same token the pressure to take risk associated with sustainable development into account has also led some of the companies interviewed to set specific targets for

turning strategy into action and simultaneously making these companies more accountable.

In terms of the association between environmental and sustainable development issues made in corporations, many large companies are viewing the transition as a natural progression. This goes from basic cost consciousness and efforts to reduce overheads through changes in understanding about the products themselves and their environmental impacts; to an understanding of their interaction with and influence on the communities quality of life where they operate. The key message here is that public perception has a strong influence on some companies, past regulated companies have environmental management on their agenda and it is generally market pressure which has created a need for these factors to be considered rather than altruism or good will. The social issues addressed by companies reflect more about the potential risk of behaviour that is viewed as unethical or not based on stakeholders' values. Socio-economic activities undertaken by business centre on core business issues and ways in which companies can increase market share, retain staff and enhance staff capabilities.

Companies that have recognised both the potential and the risk involved in not addressing sustainable competitiveness deliver the best practice in relation to sustainable development. In relation to business attitudes the understanding of sustainable development and whether or not a company perceives this as a threat or an opportunity will have a significant on the ability of that company to implement more sustainable business practices. On the whole, the large companies interviewed

were turning the possible threat of sustainable development into an opportunity whereas the SMEs interviewed were reacting to a threat in a limited way.

There are a number of features of business management styles that determine both the corporate commitment and reaction to the pressures that can create sustainable competitiveness. Proactive and large companies are leading the way in relation to sustainable competitiveness. This is a result of seeking new ways to gain competitive advantage and sensing a series of pressures that create a policy environment more aligned to the objectives of sustainable development at a global and European level. In addition large companies have the resources to influence and change behaviour reflecting their proactive stance.

Where smaller companies do understand the pressures relating to sustainable development, they are not liable for the same extent of public pressures at this stage and nor do they have resources to be highly proactive about future policy direction. Instead these businesses can be encouraged to become sustainably competitive by putting pressure on the smaller companies through government intervention such as legislation and market mechanisms and supporting small companies to address the issues such measure seek to mitigate. There is evidence that smaller companies react favourably to support where it is tailored to suit individual businesses.

The supports offered by government or the wider public sector do not have a significant impact on the companies interviewed, except the SMEs. The SMEs interviewed welcomed the support offered for developing partnerships, information

and knowledge and grants and this encouraged both a partnership with the public sector and more eco-efficient processes and in one case, as mentioned earlier in this section, a more efficient product lifecycle. These supports were not taken up or indeed desired by the larger companies. Large companies are interested in partnerships with the public sector but this is much more about influencing government policy and practice than as a response to it. Government leadership was only evident in one case, with a previously regulated company and its impact on natural environmental conservation offered potential for more influence in this area. The use of tools by companies was widespread but where the SMEs accepted the tools developed by the public sector for more efficient management of their processes, the large companies all developed their own dedicated tools which incorporated efficiency and increased reporting and accountability. Large companies will develop their own support mechanisms but this trend puts even more emphasis on government leadership to establish the direction that they should be working in.

The companies interviewed were clear in stating that they are most interested not in support from government (except in the case of the SMEs) but in clear vision and direction from government. The companies interviewed suggested that one way for government to achieve this is by publication of sustainable development indicators. The sectoral emphasis applied in the UK indicators was criticised for putting more emphasis on energy consumption than on possible solutions to sustainable lifestyles. Another recommendation for government was to offer more examples of good practice in the public sector and thereby take a stance on leadership for a particular vision of sustainable development. Lastly, for the purposes of demonstrating

leadership and making sustainable development in practice more clearly understood, the companies interviewed suggested that government should make the links between sustainable development policy and other government priorities more explicit.

The other area that companies mentioned in regard to a role for government was in relation to increasing consumer demand for more sustainable lifestyles and products. The method for doing this that was suggested by the companies interviewed was to increase public awareness and understanding about sustainable development. In particular this could be targeted towards creating a culture change amongst consumers.

A company's ability to become more sustainable is a reflection of a number of aspects of business operations and of business attitudes, particularly in relation to understanding of sustainable development and management style. Other factors about business operations are the dependence on energy for that company and the impact of replacing fossil fuel use with renewable energy, location and dependence on retaining current locations, and the resources that the company has at its disposal to address issues about sustainability. Energy, and particularly its usage from fossil fuel sources, has a significant impact on business operations in relation to sustainable development. This is perhaps a reflection of the importance attached to this issue both at a global political level and a Scotland and UK level. It may also be a reflection of increasing political instability in mining or drilling areas and a reflection of the uncertainty over the quantity of resources available. Location can be

important to particular brand names or products as raw material, for example, in malt whiskey distillation, and the extent to which this is true will affect corporate willingness to address issues about sustainability. Lastly it is also true that the more resources a company has, the more it is willing to invest in new technologies, looking to the future and innovating and consequently such companies have more opportunity to become more sustainable through innovation.

There is a clear sectoral bias in relation to the pressures that have resulted in sustainable competitive behaviour. The sectoral bias specifically relates to the energy sector and influences behaviour in any producer or large user of energy. The main areas where government is influencing business behaviour is through regulations, market mechanisms and by targeting area of business risk such as in relation to the energy sector as described above. There is enormous scope for the area of sustainable corporate governance to influence and create substantially more sustainable competitiveness in business.

The companies interviewed have each found ways of becoming more competitive while simultaneously becoming more sustainable. A significant factor in this is the increasing recognition amongst businesses that not being sustainable in certain areas of work, especially where these relate to the use or production of fossil fuels, is a high business risk. At the same time there is an increasing emphasis on corporate reporting and companies are becoming more accountable about their activities in relation to sustainable development as a response to increasing pressure from stakeholders. The capacity of large companies to undertake long-term strategy and

scenario planning makes their approach even more likely to be increasingly sustainable if current trends continue.

However it is important to note at this stage that the companies interviewed were selected because of their good practice in relation to sustainable development. There were some sectors of business and industry that were not willing to give interviews for this thesis and it is possible that the practice they undertake is not particularly sustainable. In addition there are many more companies in all sectors, and particularly the smaller companies, that were not noted for their sustainable practice. There is clear potential for companies to become increasingly sustainable but only the well-resourced and proactive companies are currently doing this by turning business risks into opportunities. The kind of momentum and public opinion about global warming and energy consumption has reached these companies and to influence other aspects of business behaviour a similar amount of resonance for other issues would need to be reached. The influence of government in Scotland on business activities appears to be very limited but its potential is great and the business interviewed have offered a range of activities that they believe will lead to more sustainable business activity.

CHAPTER SEVEN: RECONCILIATION OF EFFORTS IN THE PUBLIC AND PRIVATE SECTORS

7.1 Introduction

The aim of the thesis is to investigate the potential to reconcile sustainable development and competitiveness in the public and private sectors and in order to achieve this the thesis works to meet a number of objectives. Earlier chapters explored three of the four objectives. The fourth objective of the thesis is to understand whether or not the activities of each sector are synergistic, complementary, consistent or working against each other to achieve the reconciliation of sustainable development and competitiveness. This chapter aims to analyse the activities of each sector described in Chapters Five and Six and compare and contrast their influence on each other and on the potential to reconcile sustainable development and competitiveness.

Chapters One to Four set out the literature review of sustainable development and competitiveness and reached conclusions about the potential for reconciliation of sustainable development and competitiveness in theory as well as what the global policy context does or does not do to achieve this reconciliation. Chapter Two proposed a concept of sustainable competitiveness that describes the reconciliation of the concepts of sustainable development and competitiveness. Chapter Four presented a theoretical matrix of sustainable competitiveness and the drivers and supports that encourage its implementation based on the literature review of earlier chapters and the global examples of good practice that exist. This matrix is used in

this chapter as a comparator between the activities in Scotland and the current possibilities.

Chapters Five and Six have set out and described in context the examples of good practice that exist in Scotland in relation to sustainable development and competitiveness in the public and private sectors. These examples and the policy context, within which they are set, were analysed across a range of themes. The themes were:

- government priorities:
- understanding of sustainable development;
- ability to deliver it;
- the form and effectiveness of actions; and
- the integration of sustainable development and competitiveness.

Each chapter concluded with a matrix describing the main types of drivers and supporters, based on that designed in Chapter Four, that were used to encourage more sustainable behaviour and what types of behaviour such mechanisms actually encouraged. The results from each chapter are drawn together in a Scottish data matrix in this chapter (Table 7.1) and this forms the basis of the analysis.

The chapter is split into six sections of which this introduction is the first. The second section integrates the two matrices from Chapters Five and Six in Table 7.1 and the subsequent sections interpret this. Section 7.3 explores the concept of sustainable competitiveness, and compares the integrated Scottish data matrix against the example based matrix concluded at the end of Chapter Four. This section offers

insight into how Scotland approaches the reconciliation of sustainable development and competitiveness compared with the potential for reconciliation that exists in the current policy framework described in Chapters Three and Five and the activity that other nations and global companies are engaged in currently. Section 7.4 explores the policy aspect of reconciliation by exploring the activities undertaken in Scotland against the context of political, financial and technical feasibility first presented in Chapter Two. This section analyses whether or not business can be encouraged to be more sustainable by government in Scotland and the extent to which private sector activity can lead to more sustainable development. Section 7.5 explores implementation in Scotland, analysing whether or not the approaches taken by each sector are synergistic, complementary, consistent or contradictory. The final section summarises the analysis.

7.2 The Sustainable Development/ Competitiveness Integrated Data Matrix

Chapters Five and Six identified particular actions being undertaken by both the public sector and the private sector in relation to sustainable development. These two chapters also presented findings on the influences of those actions on the private sector. It is now possible to compare the actions against their influences and through analysis understand more about the role that government in Scotland has in driving or supporting the influences that create sustainable development. The activities that each sector is undertaking and the influences on those that were described in each sector have been used to construct the matrix. The details of this are available in Chapters Five and Six. An integrated data matrix is presented below which incorporate the findings from both chapters.

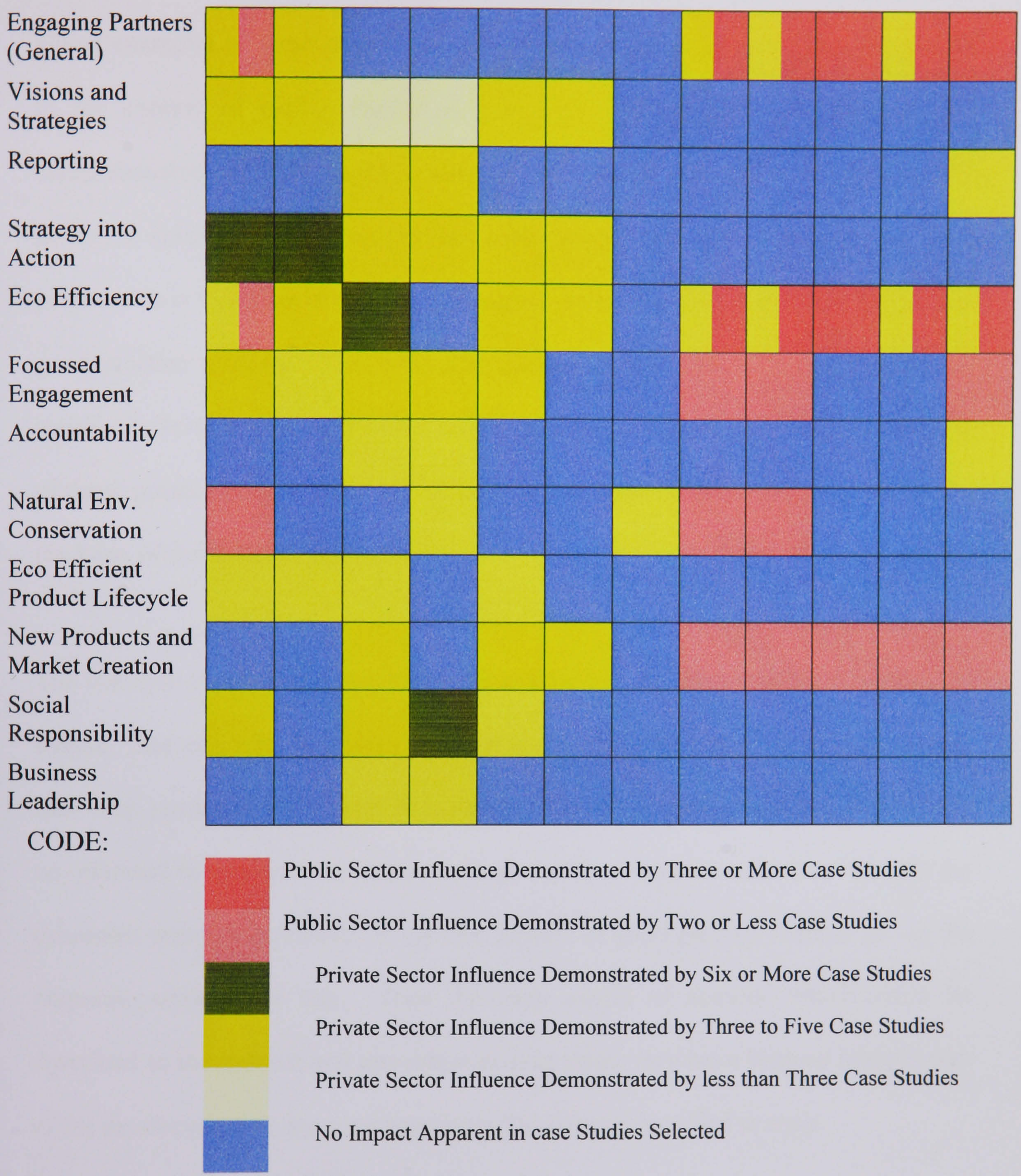
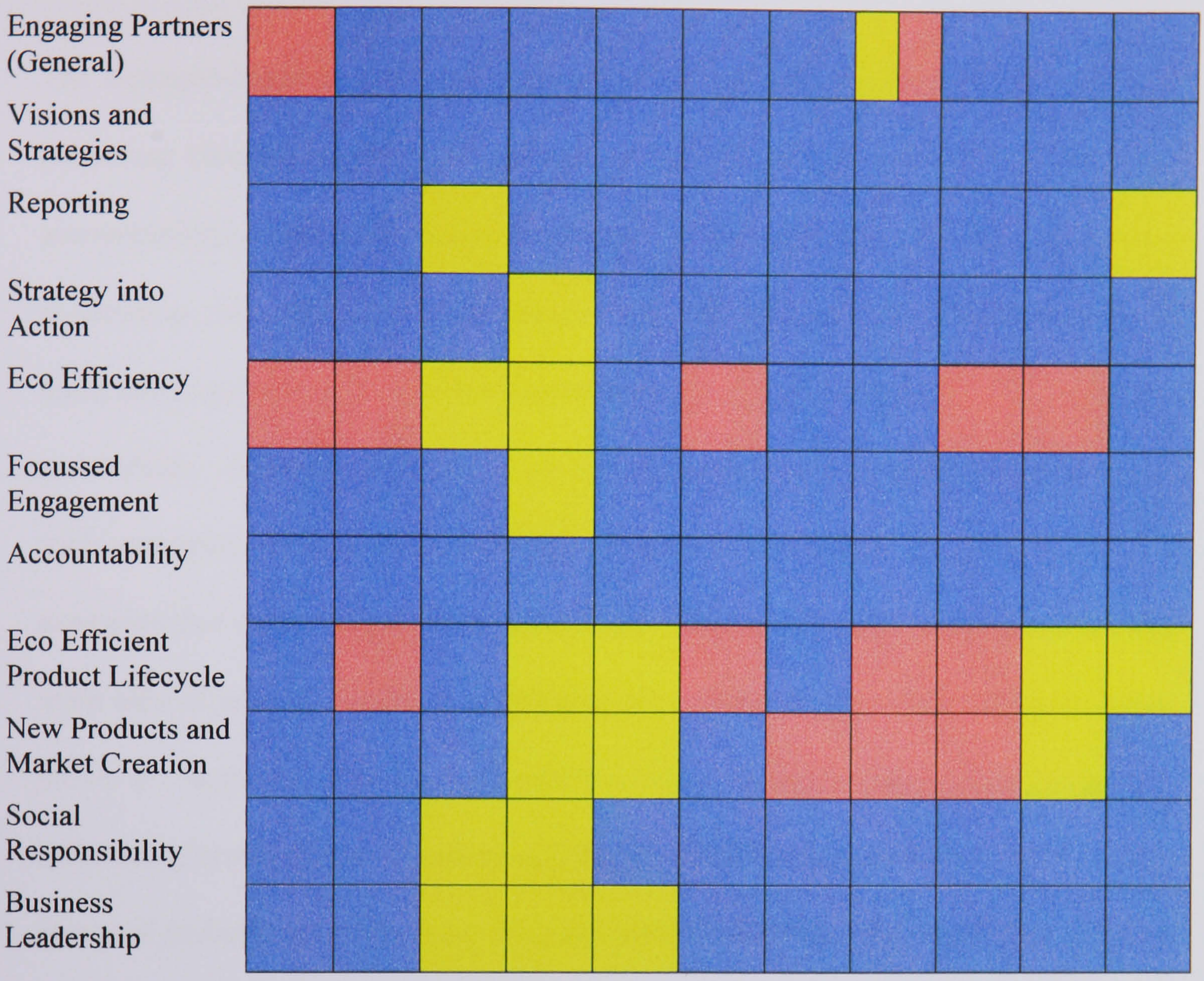


Table 7.1: Scottish Data Sustainable Competitiveness Matrix

7.3 Comparison of Practice Against the Potential for Reconciliation

Chapter Four concluded with a sustainable competitiveness matrix based on the global examples of good practice from the public and private sectors and developed in the context of earlier theoretical analysis. While this is not necessarily a comprehensive overview of the theoretical potential of sustainable competitiveness action, it does offer some insight into activities in other policy contexts for good practice. It is therefore of interest to compare Scottish activity with that accepted as good practice globally. This will offer further insight into the practical extent of activity in Scotland. A copy of the table presented in Chapter Four acts as reminder of those points (Table 4.1 below). A comparison between Table 4.1 and Table 7.1 is the basis of the analysis that follows.

The example-based matrix requires to be analysed in the context of the Scottish data matrix. The examples that were analysed in Chapter Four did not give much insight into what prompted the activity that was recognised as good practice and there was no reference to corporate visions or strategies in the examples reviewed. Equally the examples were giving details of specific aspects of good practice without giving the corporate context for this. Thus the early stages of activity, which could be described as the interest and awareness raising stage, may have been an integral part of the development of the good practice without being recorded as such.



CODE: RED: PUBLIC SECTOR INFLUENCE ON ACTIVITY

YELLOW: PRIVATE SECTOR INFLUENCE ON ACTIVITY
BLUE: NO IMPACT APPARENT IN EXAMPLES SELECTED

Table 4.1: Example Based Sustainable Competitiveness Matrix

In relation to the interest and awareness raising stage the activity in the example-based matrix is much more limited than that evidenced in Scotland. Partnerships and regulations were the only public sector activities perceived as engaging partners in the example based matrix compared to a much wider range of activity in the Scottish

examples. The same private sector drivers and supports as in Scotland stimulated reporting activities although in Scotland the additional feature of stakeholders acted as a driver for action.

The example-based matrix demonstrated little in driving efficient and responsible behaviour (turning strategy into action, eco-efficiency, focussed engagement and accountability). Again this needs to be taken in the context of the examples selected to develop this matrix. As examples of good practice, such activities may be undertaken quite widely but not reported as good practice because they are more mainstream. Alternatively it could be that such practice is not undertaken at all and such examples do not exist, although in light of the nature of the best practice examples that show activity in the final third of the matrix, this seems unlikely. The main area of activity here is in relation to eco-efficiency. Many of the same factors drove or supported this kind of practice but stakeholders appear to have more influence globally than in Scotland and the potential for new markets is not as widely accepted globally as in Scotland with this kind of activity. Accountability does not appear to have been encouraged at all in other countries with the outcome of good practice, whereas it is apparent in Scotland.

There is much stronger public sector involvement in encouraging and creating drivers for eco-efficient product lifecycles through the examples of eco-industrial and industrial ecology business parks in the global examples than the Scottish ones, for example. The public sector in Scotland is not driving or supporting this approach at all. The private sector appears to be more involved in this activity in the global

examples, with a stronger role by stakeholders and private sector development of tools and use of staff that encourage this practice amongst other business partners. In relation to new products and market creation the private sector globally appears more willing to look for the opportunity than a response to business risk. The converse of this appears to be true in Scotland, suggesting that an absence of innovation culture is one of the barriers to more active roles for the public sector in Scotland. The examples that relate to social responsibility globally appear to be driven by the same things as social responsibility in Scotland. Equally private sector drivers rather than public sector support or drivers similarly stimulate the driver for business leadership globally as it is in Scotland. However a further reflection of the more innovative approach that appears to be more commonplace abroad, the business leadership is also stimulated by the potential for new market development and is reflected in examples of industrial ecology and innovation centres that are not present in Scotland.

The data for each table was collected in a different way but there are signs that Scotland is not as innovative as other countries. This reflects public sector activities and there are many examples of more sustainable business practice through partnerships with public and other private sector partners that do not occur in Scotland. The public sector in other countries appears more willing to engage in encouraging eco-efficient product lifecycles and new product and market creation than in Scotland. However public sector involvement in social responsibility and business leadership is limited in other countries as it is in Scotland.

7.4 Political, Financial and Technical Feasibility

The public sector is weak in several regards in terms of its approach to encouraging business and industry to be more sustainable. Firstly it does not take a leadership role in promoting clear policy direction, or indicators that set the context for future developments. It does not raise awareness amongst the public in relation to sustainable development and their role in creating demand for more sustainable technologies and more sustainable lifestyles. The policy framework that the public sector is acting within is limited in its dominating approach to promoting efficiency as the only means by which companies can become more sustainable and fails to address issues about social responsibility for business and industry altogether. It also fails to address issues about consumption. Where the public sector does apply the policy framework and implement action on it, it again takes a limited approach. There is scant regard for the potential of innovation to create more sustainable practice despite the high priority given to it in policy. Where the policy supports the development of more competitive business the public sector only views its role in this in terms of encouraging more efficiency, whereas business itself sees a much more extensive role incorporating social responsibility, and innovation. Thus it appears that the political feasibility of sustainable development in Scotland is weak.

In financial terms funding can be raised to support sustainable development through application of GDP or through stimulation of business led initiatives or through grant funding, such as that from European sources. Much of the public sector activity in Scotland is funded by grant sources and much of this is European. In addition the public sector has applied grants to project activity. None of the work is

mainstreamed and therefore all work to date on sustainable development in the business and industry sector that is supported or driven by the public sector is grant funded. The annual growth rate in the UK is around 2% and consequently less than the 3% that was stated as being necessary for more sustainable behaviour (WCED, 1987). Without a higher growth rate, it may be difficult for the public sector to apply funding to this area of activity, which in the current policy climate is perceived to be desirable but not essential. The other source of funding, which would contribute to GDP, is increased revenues in business that can be applied to more sustainable innovation, R&D or project based work. From the data gathered in relation to Scotland it would appear that this resource is only available from certain sectors of business under particular pressures from business risk and stakeholders. Business and industry are stating that there is insufficient demand from consumers or potential consumers for more sustainable products and lifestyles. Therefore at this stage there is little to encourage business to allocate funding to this kind of activity. The lack of leadership and other aspects of political feasibility described above are doing little to encourage this behaviour.

The technical feasibility of policy and activity in Scotland to encourage more sustainable development in the business and industry sector is also limited. As noted above the business case for innovation for more sustainable products or lifestyles does not appear to exist in Scotland. This has the result that companies are not innovating as much as they could be in relation to sustainable development. When this is combined with the total lack of support for technological innovation from the public sector it appears that there is little to encourage this kind of activity at all.

7.5 Implementation: Reconciling Sustainable Development and Competitiveness in Practice

This section introduces and analyses each element of good practice listed down the side of the Scottish data matrix presented in Table 7.1. Following an overview of the main features of the table, each sub-section starts with a brief overview of the action described and then it offers analysis of the impacts of the drivers and supports on the implementation of specific aspects of practice. Each sub-section also describes whether or not the activities of each sector are synergistic, complementary, consistent or inconsistent. In each section the relevant row from the Scottish data matrix is inserted as a memory aid.

7.5.1 Overview

The public sector agencies in Scotland largely promote sustainable development in business by offering support through developing partnerships, offering knowledge and information about methodologies, offering staff resources through project work or student placements, offering grants for specific activities and tools to monitor and guide developments. This is project-based work and therefore time limited. The main outcome of this work is in engaging businesses in the sustainable development agenda and in encouraging eco-efficiency. In specific cases the public sector has encouraged more focussed engagement and activity to enhance the natural environment (Railtrack) and the creation of new products (recycled paper bags at Smith Anderson).

The SMEs were both heavily influenced by the support they were offered. The project based technique was also instrumental in engaging UDV in community based

work. The regulation driven and regulator pressure on Railtrack encouraged the natural environment work. Other than these cases, the big companies had not utilised nor had an interest in utilising the support tools offered by agencies.

The support tools offered by government and its agencies are resource intensive to apply and have a limited audience. Regulations and market mechanisms can reach a wider audience. However in Scotland the public sector agencies and representatives interviewed were not responsible for establishing or implementing market mechanisms. Consequently they referred to the influence of regulations but not market mechanisms, which are administered by the UK government. Regulations had similar influence to the support mechanisms, encouraging engagement in the issues, eco-efficiency and natural environment conservation.

This illustrates that the focus of Scottish policy is on encouraging eco-efficiency and to a limited extent natural environment conservation. The emphasis of the regulations is related to the emphasis of the support mechanisms offered, giving a consistent message. The activities promoted could be described as the building blocks for an industrial ecology approach but show no signs of encouraging the trademark life-cycle approach advocated by this practice. The public sector has not demonstrated an approach consistent with the theory of ecological modernisation in regard to most of the support it offers business, by failing to encourage more sustainable product innovation. Smith Anderson did develop new products consistent with ecological modernisation but this was a by-product of the project, not a specific objective.

An example of the ecological modernisation approach by Scotland's public sector is through leadership in the consensual and communicative approach illustrated by the engagement of Shell in the Cabinet Sub Committee on a Sustainable Scotland (CSCSS). A parallel development has occurred at UK level engaging private sector companies in government advisory bodies.

The key areas that are influenced by drivers of private sector activity are the role of enacting strategy, delivering eco-efficiency and involvement in social responsibility. Interestingly, while all drivers affect the enactment of business strategy and inform its development in relation to sustainable development, it is regulations and market mechanisms that have the furthest reaching role in this data set. The other drivers, specifically business risk, stakeholders, new market potential and global trends, each affect different companies and there is an indication that the capacity of a given driver to influence corporate strategy is a function of the business context in which that company operates. The support tools offered by the public sector have not influenced business visions and strategies or their enactment at all. This indicates that the types of activities encouraged by the public sector are not changing core business strategies, rather that they are supporting efficiency changes only.

There is some limited progress towards industrial ecology. Although eco-efficiency is strongly driven by a range of factors, eco-efficient product lifecycles, the industrial ecology model, are less encouraged. A small number of companies interviewed have started to develop this approach looking at the lifecycle implications of certain

aspects of their operations. This is however not undertaken in relation to full operations. Stakeholders and global trends are not driving this activity. This is perhaps a reflection of the lack of pressure to develop eco-efficiency to a more holistic level, i.e. to industrial ecology.

Ecological modernisation has been promoted as a rational solution to encouraging business sustainability. Ecological modernisation advocates eco-efficiency, with a broad enough vision to accommodate eco-efficiency product lifecycle. It encapsulates the development of strategy and its implementation. It further encapsulates a consensual style of policy making such as that which encourages focussed engagement of businesses and could be extrapolated to describe a business leadership role although with an emphasis in ecological modernisation theory on public policy roles rather on the roles of other sectors, this is a tenuous extrapolation. The emphasis of ecological modernisation on innovation offers a link to the development of new products and market creation.

However, the actual focus of ecological modernisation is highly strategic and lacks detail about the specific components of a practical model to deliver ecological modernisation. In fact, as noted in Chapter Two, efforts to practically apply ecological modernisation to Swedish policy have not been successful. In identifying the types of activities that businesses are motivated to undertake, there are a number of actions that ecological modernisation theory has not addressed in any detail. The role of ecological modernisation in encouraging social responsibility is still a matter of controversy. Little mention is made of natural environment conservation in

ecological modernisation theory debates and there is no mention of the role of business reporting and accountability. In addition there is little in ecological modernisation theory that engages business in developing a more sustainable business strategy. These areas indicate where the gaps between ecological modernisation theory and a more holistic sustainable development approach may exist.

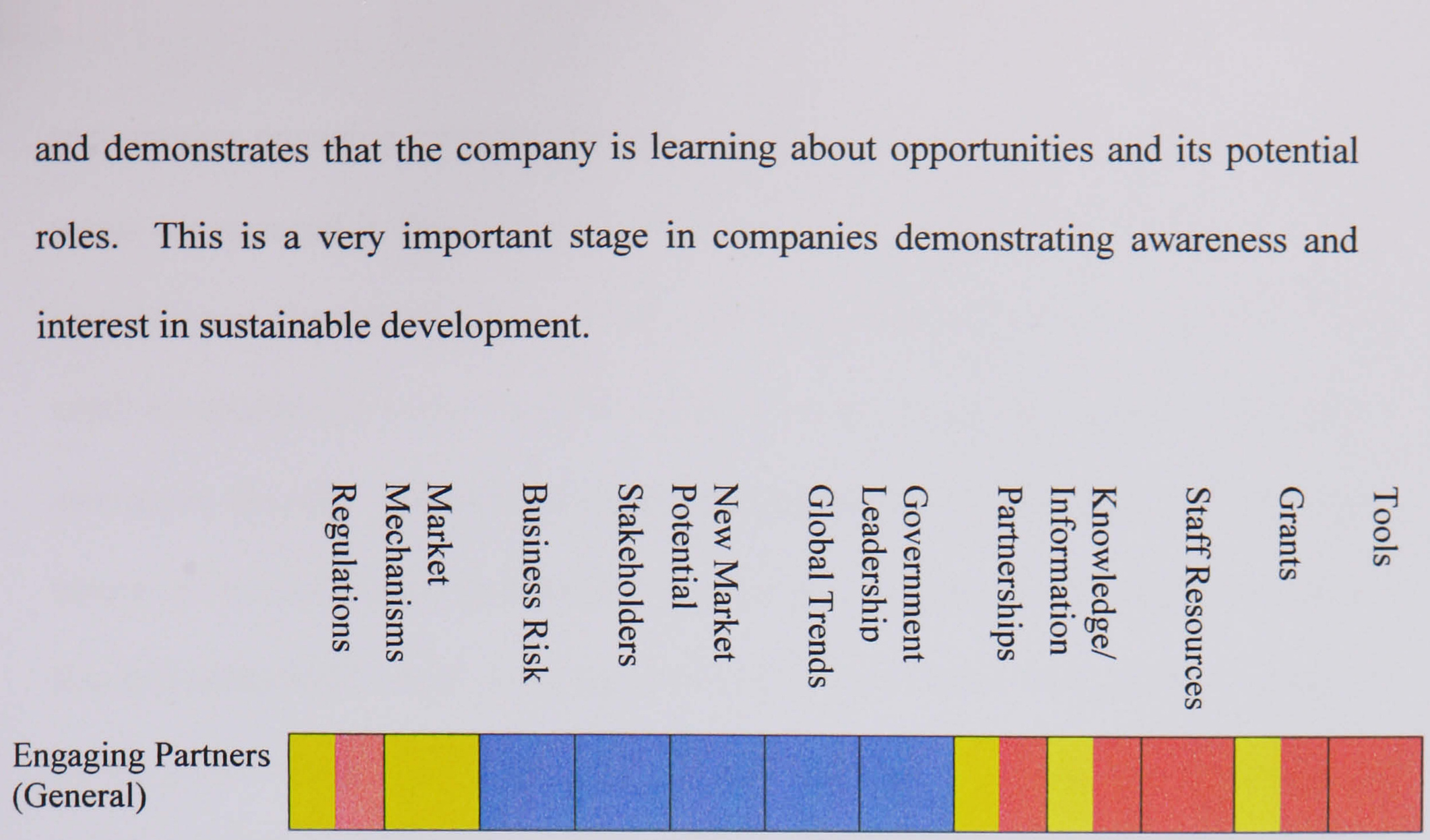
What should also be recognised is the weakness of the public sector in addressing any aspects other than eco-efficiency. While it has found ways to encourage activities in the natural environment conservation and new products and market creation, these efforts are extremely limited, even at the level of innovative project activity. In the case of the latter, the activity was a by-product rather than an objective. Most of the sustainable activities that are being delivered exist outwith the public sectors priority areas and if business is to be encouraged to become more sustainable, ways to affect its drivers need to be found.

7.5.2 Engaging Partners (General)

Engaging Partners (General): The company may start to discuss sustainable development issues with outside organisations, perhaps public sector agencies, NGOs, other businesses or stakeholders.

When a business starts to engage with partners on a general basis and in the context of sustainable development, it can demonstrate that the business is starting to consider sustainable development issues and its own role in implementing good practice. Engagement with potential partners can involve exploratory discussions

and demonstrates that the company is learning about opportunities and its potential roles. This is a very important stage in companies demonstrating awareness and interest in sustainable development.



The thesis Introduction described modes of changing behaviour. One of these is legislation. Both sectors are active in engaging partners as a result of laws relating to waste management. Market mechanisms are similar to laws in their role as instigators of change through communicating a government priority and setting a stringent rule that affects companies that do not address that priority sufficiently. The public sector has succeeded in encouraging engagement between public and private sectors that communicate the priorities of the market mechanisms that largely relate to energy and waste management. There was no evidence amongst the companies interviewed that the market mechanisms had encouraged engagement between partners in the private sector without the engagement of the public sector.

Other modes of changing behaviour are the communication of education and values. In relation to engaging partners, education and values can be communicated through partnerships, information/ knowledge and grants. Both sectors are engaged in all these practices in the group of organisations interviewed. The public sector are

encouraging engaging partners through establishing business clubs and the private sector are engaged in this activity through supply chain strategies. Information and knowledge is disseminated through the same mechanisms. Grants too are awarded to small companies as a way of communicating values about the subject of the grant awards, in the cases interviewed this largely relates to eco-efficiency. However the nature of what is being communicated through these channels is of most importance. Eco-efficiency is the main thing that is being communicated through these channels by the public sector. From the private sector, where it occurs, the key messages relate to a broad range of ethics, values and principles and support through the supply chain process relates to social responsibility as well as environmental activities for some companies interviewed.

Small group management is the final mode of changing behaviour noted in the Introduction. In this context it is about small groups of business working together, engaging with each other, to address a particular issue or set of issues. In two public sector led initiatives aimed at small business this collective philosophy has been applied through offering tools and staff resources. The programmes of work, aimed at making small companies more efficient, worked with a group of small companies in a restricted geographic area encouraging businesses to learn from each other and engage in partnerships both with the public sector leading the activities and with the other companies engaged.

In terms of generally engaging companies, regulations and market mechanisms were the key influences recognised by the private sector. This general engagement in the issues was most encouraged by the support mechanisms offered by the public sector.

The public sector has taken a strong role in engaging with partners and encouraging businesses to engage with each other through a range of support and driving mechanisms. However the values and priorities that are being communicated through this process relate only to eco-efficiency measures and specifically relate to energy and waste management. This sets the context for a limited perspective by all companies that engage with the sustainable development agenda through public sector led partnerships, projects, taxation or enforcement activities. The public sector also lacks consistency and completeness in this process of engagement. Even where it relates to legislation, the most consistent possible application, it is a highly localised and variable process as to whether or not a project or partnership to facilitate engagement will be developed and delivered. This process is therefore limited in the messages it communicates and limited in reaching all areas of the country and all sectors of business. This approach is also predominately targeted to SMEs and therefore does little to address awareness raising amongst larger companies.

The private sector approach is also extremely limited and lacks strategic context relying solely on the interest of certain large companies to undertake the role of engaging partners. Where business does pursue this type of activity, it is not limited to messages about eco-efficiency. The businesses that are engaging partners through

legislation, market mechanisms, grants, information/ knowledge, partnerships and small group management are promoting ethics, values and principles that relate to sustainable development and incorporate social responsibility as well as environmental concerns. This is especially true where a supply chain approach is adopted.

The efforts of the public and private sectors in regard to engaging partners and communicating messages about the nature of change required to move towards more sustainable development are complementary. They reach different audiences and both communicate aspects of sustainable development, although neither individually nor together does this communicate a holistic approach. There is no synergy between the efforts made as no strategic context applies to either sectoral approach. Any consistency in the messages communicated that support engagement for understanding and awareness raising is accidental it appears and in fact only exists where business and the public sector both communicate messages about eco-efficiency. It should be noted that the data relating to this section is limited by nature of the companies interviewed being engaged in sustainable development activity and partnerships already.

7.5.3 Visions and Strategies (Corporate Planning)

Visions and Strategies (Corporate Planning): Setting corporate visions and strategies where companies start to take ideas about sustainable development into the corporate planning process and where strategy starts to take sustainable development into consideration to some extent.

A corporate vision or strategy that makes reference to sustainable development is an indication of that company's awareness and interest in sustainable development. The ability of business to set a corporate vision and strategy that is in line with sustainable development will depend on the signals that company receives from government and how the company interprets them, both globally and nationally. A company will assess such signals in relation to values of resources, people and priority attached to sustainable development issues, relative to other business pressures and signals.

The drivers of action have a strong influence on business taking sustainable development into account in vision and strategy setting. In the companies interviewed, corporate strategies reflect a mixture of ethics and risk management and their approach to sustainable development varies according to the nature of the business and the various pressures on it. Therefore the level of influence each driver has bears a strong relationship to the nature of the business. Specifically, the businesses in the energy sector or oil and gas production have developed strategies reflecting the pressures of global warming trends and other corporate strategies aimed at more sustainable lifestyles. Those companies being proactive are responding to global trends and the scenarios about the ways they may lead to

potential new markets and potential changes in legislation. Other companies are reacting to increased business risks of actual legislation or market mechanisms. Much of the influence that has encouraged business to incorporate sustainable development into corporate visions and strategies has come from activity at a global level and the change in consumer values at that level relating specifically to issues around climate change and social responsibility. Interestingly however stakeholders are not recognised as influencing vision and strategy in a general sense hinting that where their views are taken into account in relation to sustainable development it is not intended to influence corporate vision or strategy.

The possible supports are not being utilised to influence this aspect of company behaviour. There is potential that government leadership and partnerships with the public sector, together with increased knowledge of sustainable development, could also influence business behaviour and encourage thought to go into consideration of sustainable development in corporate vision and strategy setting. The businesses interviewed were all in agreement that a lack of sufficient clarity from government on its sustainable development strategy had made it very difficult for businesses to align with and work together to deliver the strategy.

Government is implementing a limited role here and not fulfilling its potential to influence business behaviour. The legislation and fiscal instruments that it has implemented are having an impact but as mentioned previously they are limited in scope and not all businesses are subject to the limitations imposed. The direction of government legislation is to encourage more efficient practice and there is a

particular emphasis on energy management. When compared against a list of possible sustainable competitiveness actions by business, this level of influence is extremely limited and lacks encouragement of more social responsibility and of more innovation in product and market development for sustainable development. The leadership role has been identified as weak and the potential to work in partnership to generate interest has not been utilised. Government in Scotland has not taken advantage of the high profile associated with certain global trends to add credence to its leadership role.

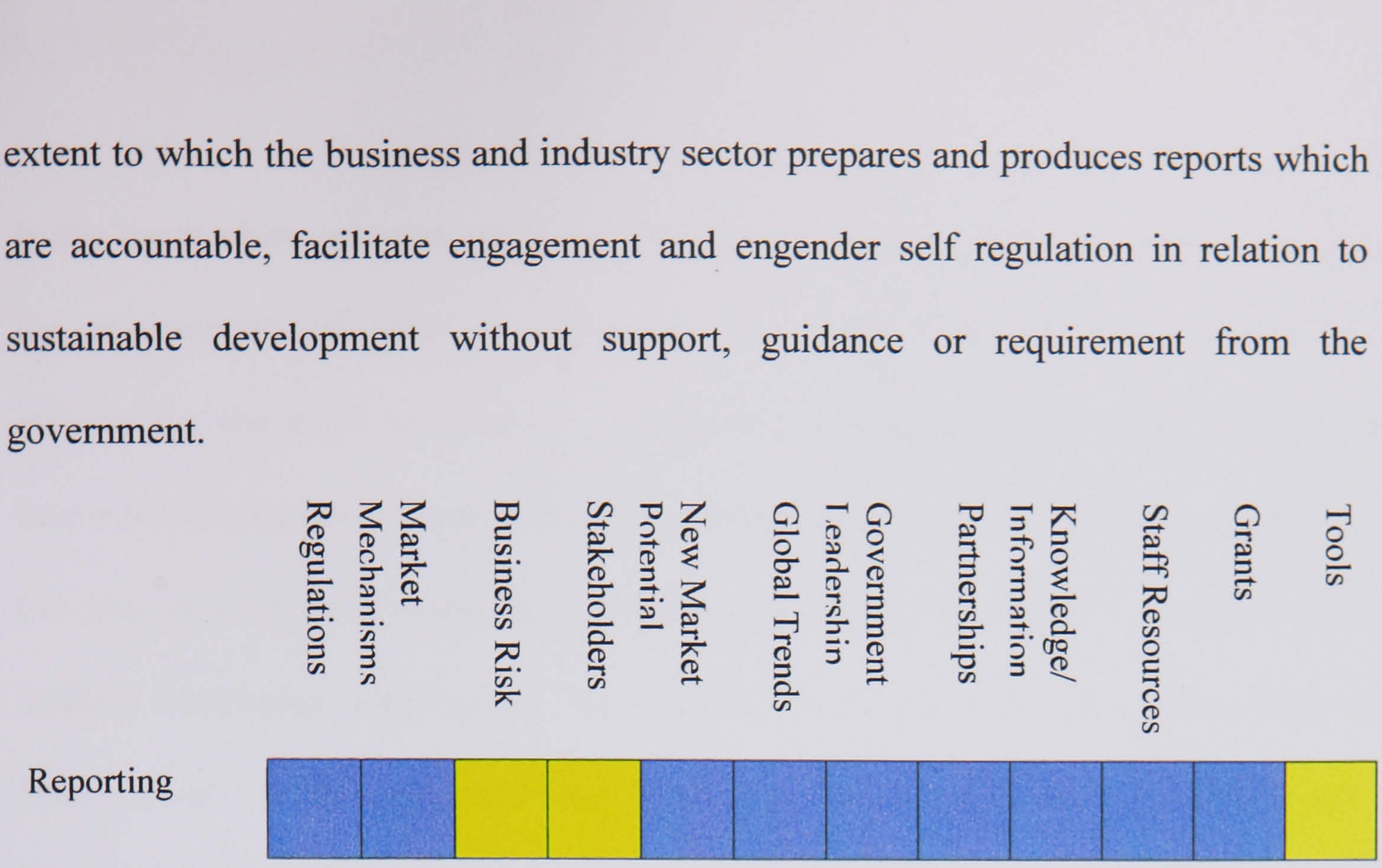
7.5.4 Reporting

Reporting: Companies publicly acknowledge their involvement in certain sustainable development activities by reporting on environmental, social or economic impacts in this context.

The standard of corporate reporting on sustainable development varies enormously, from reporting on existing basic environmental and health and safety data to reporting on measures designed to reflect a long-term and comprehensive sustainable development strategy. As reporting becomes more sophisticated, for example reporting on social impacts, or clear reporting on sustainable development strategy implementation, then it is a sign that the company is increasing its level of interest in terms of its involvement in sustainable development.

The scope of government reporting, specifically its scope and any particular measures of sustainable development, may influence the scope of business reporting and the extent to which it does has been assessed. It is also of interest to explore the

extent to which the business and industry sector prepares and produces reports which are accountable, facilitate engagement and engender self regulation in relation to sustainable development without support, guidance or requirement from the government.



The influence of drivers and supports on corporate reporting for sustainable development is limited. Business risk and stakeholder views act in synergy to encourage reporting. It is interesting that stakeholder views encourage reporting but not strategy setting. This raises various questions about the attitude of companies to stakeholders that are not covered by the scope of this thesis. However it is possible that this shows companies are interested in influencing stakeholder views but not in being influenced by them.

The ability of government to influence corporate reporting on sustainable development is hampered by its failure to engage in influencing global trends that are more sustainable or to influence choices and lifestyles of stakeholders. In addition efforts to encourage business reporting by the UK Government were undermined by a lack of commitment to implement legislation that was threatened. Guidance notes on reporting were produced but with no incentive to follow that guidance[50].

---

[50] For more information on this see http://www.sustainable-development.gov.uk

In the areas where government has made some effort to undertake its leadership role, the government indicators for sustainable development may have the potential of influencing the style and nature of reporting for some of the more aware and interested companies. These indicators however were published too late to influence the data collection and monitoring which formed the more substantive reports of the leading companies interviewed. In addition this is one area where clear links to European and global initiatives are important as many of the large companies take their lead from international or global direction. Thus the Scottish Executive's long overdue set of sustainable development indicators for Scotland (published in 2002) is doing little to enhance the Scottish government's leadership role.

Further potential exists in assisting smaller companies to develop reporting through partnerships, by offering tools such as the triple bottom line accounting package, which government has done little to promote, or by supporting companies with staff resources which can measure and report on key areas of impact. Government has offered none of these potential support mechanisms in relation to reporting. Businesses are developing their own tools to facilitate corporate reporting.

The public and the private sector activities in relation to reporting are consistent in that both sectors aspire to similar reporting standards but the public sector has missed a clear opportunity to take its leadership role in informing this process amongst the private sector's most proactive companies. Which of the two sectors will take the lead in encouraging reporting amongst the less proactive companies and thus the

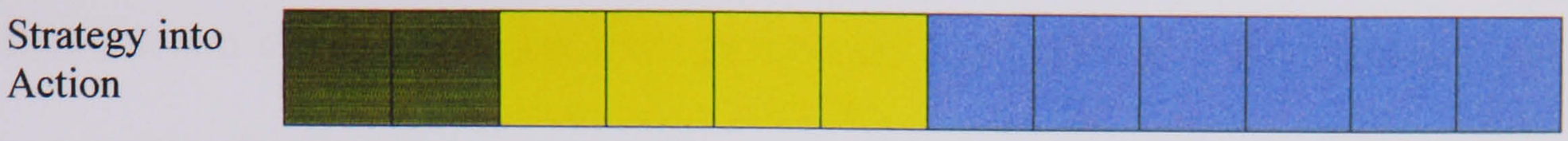
leadership role in communicating the priorities and reporting styles remains to be seen.

7.5.5 Turning Strategy into Action

Turning Strategy into Action (incorporating values, ethics and principles into decision making): Here businesses will have produced documents outlining strategy for sustainable development but there will also be evidence to support that strategy being implemented.

This theme takes into account corporate ethics, values and principles and relates these to sustainable development. It is about understanding how business makes decisions regarding ethics, values and principles and how such decisions are translated into everyday practice and prioritised. There are many influences to corporate ethics, values and principles and the way they are implemented in particular businesses. Of interest here is the extent to which corporate ethics, values and principles are in line with the principles of sustainability. The extent to which government has worked with or supported business to implement sound ethics, values and principles in relation to sustainable development is one part of this and the extent to which business is doing this without the influence of government is another.

The dominant drivers for turning strategy into action (decision-making) are new market potential, business risks, regulations and market mechanisms. To some extent global trends influenced ethics, values and principles (EV&P) but really this was actually where those global trends created a perceived business risk.



There are two dominant areas where government has an influence. One is through the legislation and market mechanisms employed by government, which sends a clear message that reduction in waste and increased efficiency of business operations are desirable goals. These messages are being incorporated into some businesses but it is not clear whether this is a result of the leadership of government or an understanding that such measures can save companies significant sums of money. As noted in Chapters Five and Six, however, this alone is not sufficient to motivate SMEs. The other area where government has set a clear statement of ethics is in the ethical trading initiative recently started by the Department for International Development (DfID)[51]. This is not led by any of the government departments with allocated responsibility for sustainable development and actually appears to be entirely separate from sustainable development activities in the public sector, despite its obvious compatibility. The partnership approach of DfID, working with companies, has created activity amongst the business sector in relation to this initiative.

---

[51] This initiative is being led by a UK Government department and as such is outwith the scope of this interviews held as part of the data collection so it's impact has not been fully explored.

Government leadership is the area with significant potential for influence but this has not been realised. Government appears to be doing very little to influence the ethics, values and principles of corporate decision-making. The lack of leadership, strategic direction and clarity on targets from government goes some way to explaining how sustainable development ethics, values and principles have not been effectively communicated to businesses and industry. A lack of public awareness raising initiatives means that any understanding of individual responsibility in relation to sustainable development, for example that adopted by staff in the companies interviewed, has been the result of non-governmental efforts.

The roles of the two sectors here are complementary. The public sector retains its focus on eco-efficiency through regulations and market mechanisms but extends a leadership role to the ethical trading initiative of DfID. Complementary to this is the interpretation of the large proactive companies interviewed to turn such trends into business opportunities and responding to the risks that such trends highlight. The role of the large private sector companies interviewed in this context is innovative. Although such innovation does not appear to be directly influenced by government, the framework of the regulations, market mechanisms and combined with the ethical initiative sends a message to encourage this efficient and responsible behaviour. The combination of laws and values here has proved to instigate a change in behaviour in some of the companies interviewed.

7.5.6 Eco-Efficiency in Production

Eco-Efficiency in Production: Here businesses will have undertaken a number of efficiency measures in their operations. Such efficiency measures will include waste

minimisation activities reducing wastes through excessive energy use, through over use of raw materials and other means of inefficient processing and sustainable practice in waste disposal where waste does arise.

Cleaner production is about reducing the emissions and pollutants arising from production. These can either be end-of-pipe solutions, changes to production methods, or changes to product design. Such changes predominantly take the form of efficiency improvements reducing energy use and wastes arising from the process of production[52]. The significant issues are about the extent to which drivers or supports from government have been developed to implement efficiency, waste reuse and recycling and reduction of waste discharged per unit of economic output and also what such efforts have achieved. It is also of interest to compare the efforts made by government in relation to the SME sector as compared with the large business sector given the potentially different abilities of those two sectors to absorb the costs of such changes to operational methods. This is set in the context of what business is doing already and outwith the benefit of such drivers or supports.

---

[52] For clarity this also includes responsible and sustainable waste management of any wastes arising from the process.

Government has brought in a range of measures, some fiscal and some regulatory, which are intended to stimulate cleaner production. At a national level little support has been given to companies in addressing the cost implications of most of these. At this level however heavy promotion of forthcoming legislation was undertaken prior to implementation of the Producer Responsibility (Packaging Waste) Regulations 1997. The level of support offered to companies for implementation has been mixed with the most support given to the most recent market mechanism, the Climate Change Levy. This possibly indicates a policy shift towards support packages. Although in neither case has government demonstrated a partnership approach, the impact of both the packaging regulations and the climate change levy have been felt and have created an incentive to change operational processes in business as noted in the previous two chapters.

Measures to support implementation and adaptation to new charges and regulations at a local level vary considerably both across the country and for each type of new legislative measure or market mechanism introduced. Some locally based projects delivered through a partnership between public and private sectors have been very successful in terms of efficiency savings for SME businesses. The benefits of the approach often went beyond the original remit and targets set in the projects. The attitude of the companies involved in such projects changed during the project with those companies becoming more interested in understanding the benefits of sustainable development and more willing to engage in partnership working with the public sector. However such locally based projects are limited by their funding arrangements and by the number of public sector agencies willing or able to

implement them. In some cases other factors have contributed to the success of the projects, especially in terms of securing volunteer companies. These factors include knowledge of forthcoming legislation, staff resources, grants and staff support. Again this indicates that the drivers apply to all companies but the support mechanisms are only relevant to the SMEs.

Big proactive businesses find it relatively easy to comply with the kinds of legislation, regulations or fiscal incentives established by the UK government. However clear direction is not always available from government to ensure that business knows what to expect and can plan to work to mitigate the effects of new legislation, regulations or fiscal instruments.

Eco-efficiency is most strongly encouraged by business risk in the sense that the companies interviewed readily identify the cost-saving benefits and in some cases the long term policy trend that is encouraging that behaviour. This relates to recognition and influence of particular regulations and market mechanisms. It is also driven by global trends, specifically relating to the rising cost and scarcity of fossil fuels and new market potential reflecting the potential of diversifying business opportunities that mitigate risk and address global trends. The smaller companies recognised the role of public sector support mechanisms in promoting eco-efficient behaviour.

The role of the European Union in setting clear direction and leadership in relation to eco-efficiency and waste management is strong and has influenced, if not forced, the UK Government to follow through this leadership by implementing specific

legislative measures and market mechanisms to encourage this behaviour. The Government in Scotland has had little scope for activity here and has only taken the role of encouraging this behaviour through specific projects often funded with European grants.

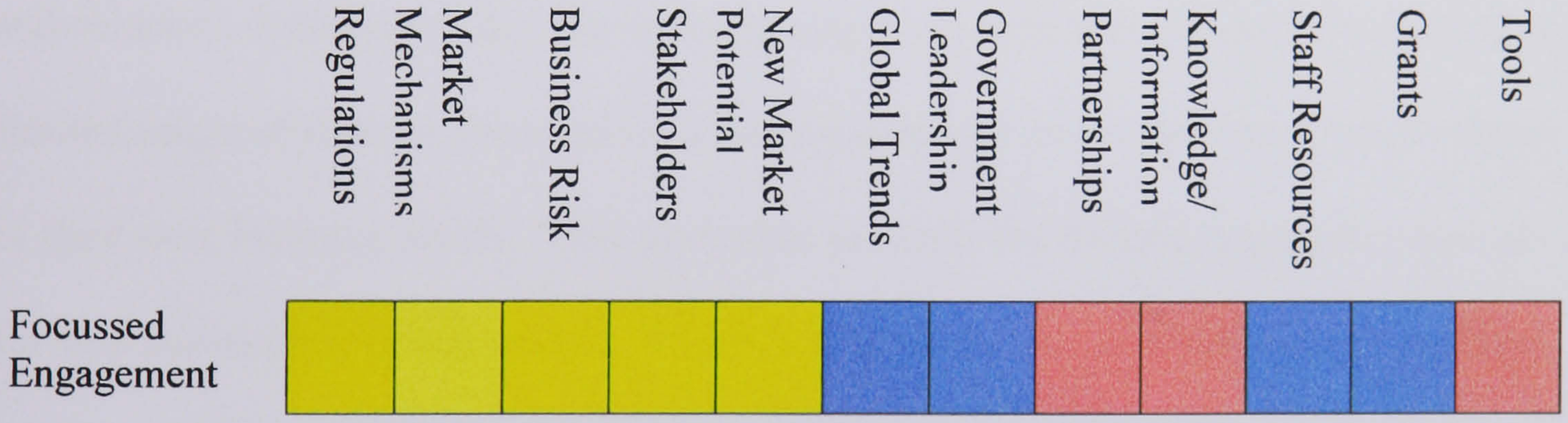
To summarise, government regulations and fiscal incentives have changed behaviour in both large and SME companies. In SME companies the benefit of partnership working has increased the chance of survival of those companies and improved environmental performance. Big companies are more willing to make investments for the return of efficiency savings once they are aware of the potential and so partnership working has not been necessary. Global trends and their impact on business risk and new market potential have also had an impact here on big businesses, where the impact of legislation or market mechanisms might otherwise be less successful.

This is one area of sustainable development activity where efforts in the public and private sectors act in synergy. Here the public sector is taking a strong lead from global trends, as is the private sector. In both cases the returns from an eco-efficient operation are apparent and both sectors are making efforts to maximise potential from this. The efforts are synergistic because the partnership approach offered by the public sector supports the SMEs to achieve their goals in this regard while the influence on the big businesses is rooted in the legislative framework coupled with the influence of global trends. Efforts relating to eco-efficiency are the most successful actions in terms of the role of both sectors of all those listed in the matrix.

7.5.7 Focussed Engagement and Interaction

Focussed Engagement with Key Stakeholders: Companies are increasingly aware that staff, consumers, shareholders and communities are key stakeholders in their business operations and sustainable action in relation to these stakeholders can include issues such as taking their views into account in setting and implementing business strategy.

It is important that the role of government in encouraging or supporting this be understood, for example in relation to exchange of technological know-how, managerial skills and market development. In addition the potentially complementary role of government in education and awareness raising will be examined to understand what influence this is having, if any, on the ability of the business and industry sector to implement sustainable development initiatives.



Many of the drivers have an impact on business activity in relation to focussed engagement and interaction with stakeholders; i.e. regulations, market mechanisms, stakeholders themselves, potential for new markets and business risk. The support mechanisms too have encouraged this behaviour to a limited extent but government leadership was not cited as an influence in this area.

The influence of regulations and market mechanisms in encouraging focussed engagement is not a result of such engagement being a regulatory matter, but a reflection of the interest of business in finding cost-effective solutions to legislation and market mechanisms. Consequently they engage with other businesses to seek lower cost joint venture solutions to the problems they are facing.

Companies have undertaken engagement to understand consumers better, local residents and other stakeholders specifically to mitigate the risks of new developments, develop new markets or because they are under pressure by particular groups of stakeholders to listen to a point of view. Inevitably some companies are taking a more comprehensive approach than others are. Business will only actively participate in activity that it believes to be good for business and which has the potential to increase that business' competitiveness. In relation to engagement with stakeholders, businesses that are actively engaging with stakeholders do so with a limited range of stakeholders and on a limited scope of issues that are directly related to their own business needs. This limitation prevents the holistic approach necessary for true sustainable development. There is a potential for conflict between business activities and sustainable development where companies are not developing business for sustainable lifestyles but are actively engaged in something that is not sustainable.

Government appears to be doing very little to support or encourage engagement of the business and industry sector with stakeholders despite engagement being at the centre of current government policy across all policy areas. In Scotland the Scottish

Executive has started to undertake an awareness raising campaign (during October 2001) but this is targeted at personal responsibility and small measures for resource efficiency in daily living. It is not aimed at encouraging people to assert their values in relation to cleaner production or responsible and ethical management of products and processes in business and industry.

The key difficulty for government in promoting engagement is the lack of clear vision and lack of strategy in communicating messages about sustainable development that covers audiences and means of communication. Further to this there is a distinct lack of willingness to follow through on engagement and the outcomes arising from any engagement are expected to be resourced by those participating in the engagement. The exceptions to this are specific projects, such as the East of Scotland Water Waste Minimisation Project, but despite offering sound demonstrations of good practice, such practice has to date failed to mainstream arguably because of a lack of resources.

Taking a limited view of the problems that are not sustainable prevents the holistic approach necessary to become more sustainable. The limitations of engagement are entirely dependent on consumer pressure and knowledge without input from the government. The research found no evidence to support the suggestion that consumers are currently demanding sustainable lifestyles although there appears to be growing awareness of globalisation and some sustainable development issues. The implications are that without further encouragement of engagement by the government, consumer demand for sustainable lifestyles is unlikely to occur to the

extent that it has a significant impact on businesses to create products suitable for a sustainable lifestyle. Here there is a role for government to engage with those businesses to find solutions that encourage them to operate in a more sustainable way and to encourage more sustainable products to make good business sense. There is no evidence to suggest that government is either considering this or at a local agency level that it has the capacity or remit to do this.

To encourage more companies to take this approach appears to be extremely difficult particularly since the business benefits of engagement are so hard to present to companies and appear to be unique to each company's individual circumstances. The issue about what engagement with stakeholders can actually be said to achieve from a business perspective is one that appears not to have been given sufficient consideration by the public sector as a means of encouraging sustainable practice. It is a low priority from a government perspective and this may reflect either a lack of commitment to engagement from the government itself or a lack of understanding about its benefits from a business perspective. Without further information to support the argument for engagement it is going to be extremely difficult to persuade further businesses to get involved in stakeholder engagement.

There is a lack of recognition by the public sector of the role of engagement with stakeholders and the potential role for influencing more sustainable lifestyles amongst the Scottish population. This leads to the conclusion that in nearly all cases public sector efforts to encourage engagement are very limited and not supporting or complementing the private sector approach. The lack of effort from the public sector

to facilitate further engagement amongst companies that are in less risky positions regarding stakeholder views, undermines its efforts in getting companies to take a more sustainable development perspective in decision-making.

7.5.8 Accountability

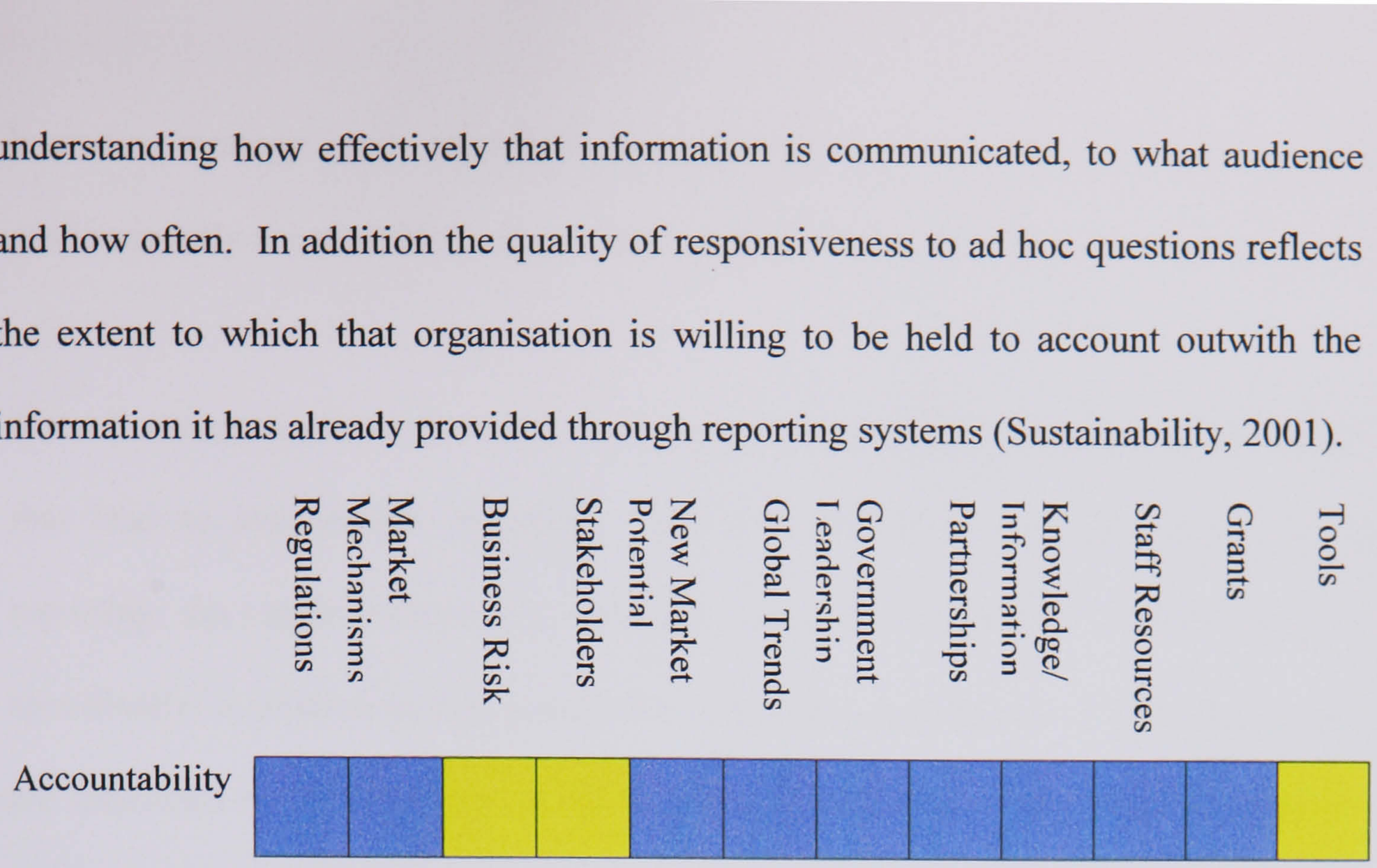
Accountability: Companies are reporting their activities to an extent that makes them more accountable about their behaviour in terms of sustainable development to their stakeholders.

Although business is not required to be accountable to citizens, it is becoming more important to increase the sector's accountability as its influence over socio-economic and environmental conditions increases. In addition the business and industry sector is finding that the culture shift towards people asking more about business operations will increasingly require companies to become more accountable in order to retain a competitive position.

Accountability is important in offering a right to stakeholders to know what affects them and how they might be able to influence relevant decisions. However accountability is also an issue of how priorities are communicated and consequently can be a significant tool in demonstrating leadership for sustainable development. By being accountable about sustainable development, government and business can each encourage behaviour to assist progress towards it.

The extent to which management systems create information about sustainable development is a first step in that sector becoming accountable. The next step is in

understanding how effectively that information is communicated, to what audience and how often. In addition the quality of responsiveness to ad hoc questions reflects the extent to which that organisation is willing to be held to account outwith the information it has already provided through reporting systems (Sustainability, 2001).



Reporting and accountability should intuitively be linked, accountability being a result of reporting. However more companies are driven to report than to be openly accountable. The drivers are the same in each case and limited to business risk and stakeholder pressures. With no regulations in place, businesses are only driven to report on sustainable development when they are perceived by stakeholders to be operating unethical or environmentally destructive operations, usually abroad. This is a function of business risk associated with changing consumer behaviour that could potentially result from such exposure. A small number of companies, such as Shell, have addressed this risk by developing tools to ease reporting and accountability.

Notably the companies that are the most accountable are also the ones that are most aware of the business potential and risk involved in sustainable development. These are the companies with the most comprehensive understanding of how sustainable development relates to their business and they have the resources to build it into their

business strategy and reporting mechanisms. However, companies remain predominantly accountable to their shareholders and boards rather than citizens.

Not all companies interviewed have designed comprehensive management systems that lead to accountable reporting. However, of those that have done so, the reporting on each company's progress towards sustainable development is specifically in relation to that companies operations and the issues that it has agreed are important to the company. There appears to be an increasing number of reports promoting accountability amongst companies. The extent to which these reports influence corporate strategy and decision-making is unclear but unlikely to be significant at this time. Companies reported during the interviews that although there is a lot of information sustainable development, it is still not core to corporate strategy.

Government appears to be unwilling to be accountable itself in relation to sustainable development. The efforts it has made in terms of publishing sustainable development indicators, which, at the time of data gathering, are not broken down in Scotland-wide data unlike the English government regions, have not succeeded in making government in the UK or Scotland accountable in regard to sustainable development. The reports prepared are difficult to interpret even when understanding of sustainable development is good. The reports are widely available through the internet but only promoted to a limited and professionally engaged group of stakeholders. Clearly national reporting on sustainable development is a big and challenging task but difficulties in interpreting this report, which is the requirement

to make the government accountable, are not limited to the general public. Companies too are finding it difficult to interpret the reporting and find the lack of leadership to be in part a result of the lack of sector-specific information. In addition no targets or rates of desired progress are presented in the reports. Nor has government prepared guidelines or set targets or responsibilities for companies to become more accountable.

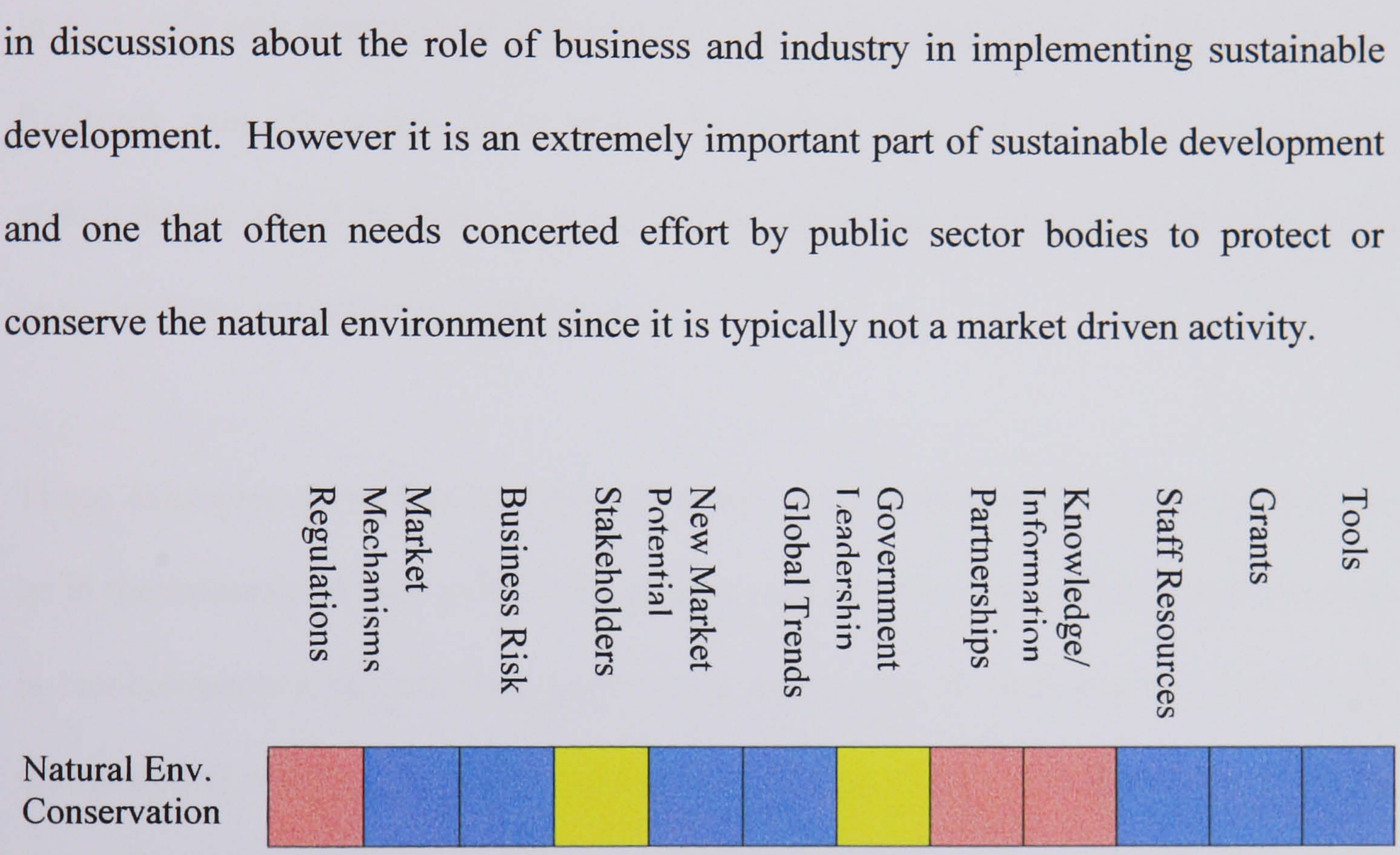
Government is therefore not in a position to encourage increased accountability amongst the business and industry sector. It is also not then in a position to establish a framework for accountability. The nature of accountability is a difficult one for sustainable development because it asks that government and to some extent companies report on the impact of actions for which they are not completely responsible. However the lack of clarity of the role of government in implementing sustainable development actually goes some way to perpetuating this situation. By not being particularly accountable in this area government is precluding the opportunity to get companies to be held to account over sustainable development activities.

The efforts of the public and private sectors are again contradictory in relation to accountability. The actions taken by government are so unclear as to render any influence over private sector accountability ineffective. The role of the private sector in accountability is therefore developing outwith any strategic framework and it is possible that private sector accountability in regard to sustainable development is not actually accountable at all, rather a marketing tool.

7.5.9 Natural Environment Conservation

Natural Environment Conservation: Companies are involved in natural environment conservation through their operations and seek to protect the environment that their operations may otherwise have a damaging effect upon.

Natural environment is often a feature of sustainable development that is disregarded in discussions about the role of business and industry in implementing sustainable development. However it is an extremely important part of sustainable development and one that often needs concerted effort by public sector bodies to protect or conserve the natural environment since it is typically not a market driven activity.



The public sector has the dominant role but not the only role in encouraging business to undertake natural environment conservation. However the examples of good practice that were encountered in the course of the research for this thesis are exceptional and not widespread. The public sector example of Drumcross Farm in Renfrewshire demonstrated the combined impact of planning regulations with partnership working and knowledge dissemination in protecting landscape on the proposed site of an industrial development. Government leadership was also in evidence over Railtrack's need to address biodiversity issues on all its land.

However stakeholders too have had a direct influence on the private sector through active campaigning as evidenced by Shell's experience with the Brent Spar.

As well as the support tools offered by the public sector that encourages natural environment conservation, there are regulations relating to biodiversity and habitat protection. Stakeholders and government leadership influence the private sector but in fact only one company of those interviewed recognised those drivers. This was Railtrack and its status as a major landowner has put it under pressure by stakeholders, whilst its status as a previously public owned company had put it under pressure from government leadership.

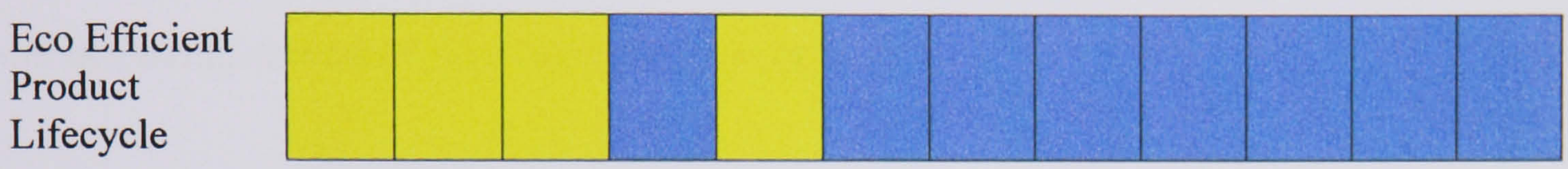
These examples show that to a limited extent natural environment conservation can be in the interests of both public and private sectors. The approach of the two sectors is complementary but not very widespread and a note of caution about how this is interpreted is required given the very few examples of this sort of activity in all the examples of good practice listed through the thesis.

7.5.10 Eco-Efficient Product Lifecycle

Eco-Efficient Product Lifecycle: here businesses can produce goods that are more easily recycled, less often disposed, which create less pollutants or waste during use, and so on.

An eco-efficient product lifecycle integrates product design issues with sustainable waste management as well as an efficient production process. This is not however possible without a high degree of innovation from producers but it is possible for

government to encourage and stimulate this practice. European legislation exists which promotes the required innovation and which sets out leadership for companies encouraging eco-efficient product lifecycles, for example the producer responsibility family of legislation and the labelling regulations requiring manufacturers of certain products to label products with energy efficiency ratings.



Only 3 of the 8 companies interviewed made a product and in each case it is packaging. For two of those this was a secondary product, for one it was the core business. This is not therefore a topic that was really covered in the data gathering for this thesis. However with the possible exception of tools as a support mechanism, all the drivers and support mechanisms mentioned so far are capable of promoting good practice in this area. Those drivers and supports recognised by the companies interviewed to have an influence in this area are regulations, market mechanisms, business risk and new market potential. Partnerships and knowledge or information dissemination were viewed as supporting this activity. It is an area that lends itself to regulation, based on the producer responsibility family of regulations. While much activity has taken place at a European level to encourage this activity, there has been very little information or supporting incentives from the UK or Scottish government in this area of work.

While the effort of the Scottish or UK government is minimal in regard to encouraging this kind of activity, the EU legislative perspective is complementary to encouraging more business effort in this area. The activity undertaken by business is innovative and again innovation with sustainable development as a goal is not something that is encouraged by the public sector in Scotland. Consequently the Scottish role of the public sector is contradictory to the private sector approach for encouraging eco-efficiency product lifecycle. It is odd that given the emphasis on eco-efficiency more systems for taking eco-efficient product lifecycles into account are not being driven or supported by government.

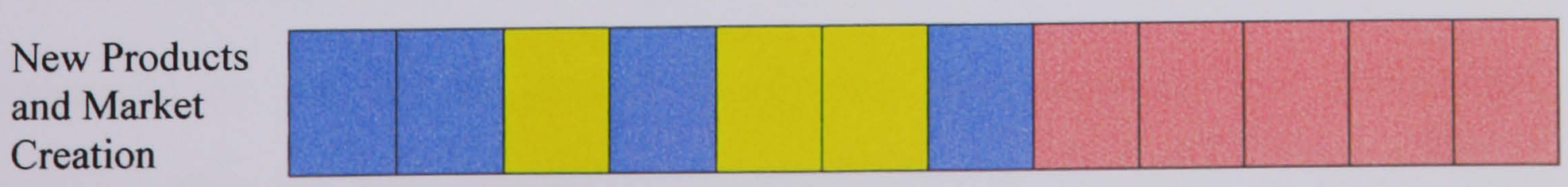
7.5.11 Marketing and Product Development

Market creation and design and build of new products: Market creation is where businesses seek to create markets for goods that are more sustainable. This can include innovation and product design; it will also include an element of public consultation and engagement. In creating new products for more sustainable lifestyles businesses can use the resources they apply to research and innovation to design products that operate differently and more sustainably than current consumer favourites. Ultimately businesses may create products from recycled materials, for example, or operate from a more service-based perspective taking responsibility for future wastes by retaining or reclaiming the final product, for example.

There are a number of ways in which both government and industry can influence and create more sustainable products and production technologies. Some of these are based on identification and application of new technologies but many can be more fully utilised by exchange of knowledge and experience. There is a role for

government to promote technological and know-how co-operation between enterprises. This could encompass identification, assessment, research and development, management, marketing and application of cleaner production. It is of interest to understand the extent to which government has an impact on this sort of exchange in relation to sustainable development. The extent to which big business has engaged with SMEs will show the extent to which the business and industry sector is making provision for exchange of information without the support of government.

In addition to the promotion of ideas and exchange of know-how, which are described above, there is another role for government and industry in research and development of products. One means of promotion of this is for government, in co-operation with the private sector, to encourage the establishment of venture capital funds for sustainable development projects and programmes. Other means are to support R&D through business services or academic endeavour, make provision for R&D facilities and encourage training that adds value to this. R&D could be commercialised to be of benefit to businesses.



In some of the case studies, an innovative role was encouraged by business risk. new market potential and global trends. In many ways these drivers are linked to create a synergy of pressure on companies to develop new products and markets. This innovative role is one encouraged by ecological modernisation theory but with no clear public sector role, it does not appear to be one being encouraged through public policy. These actions are a result of classic business competitiveness behaviour and it appears to be a coincidence that they have, in the cases interviewed, resulted in sustainable business behaviour.

Certain large companies are investing in research and development on sustainable development technologies but these are the same companies that are also heavily promoting the role of government in creating consumer demand for such products. Such companies note that there is currently a lack of demand for the products that they are developing.

In relation to exchange of technological and know-how information amongst larger businesses, many of the big businesses have established sectoral groups. Some of these have gained support from the government in relation to sustainable development, but not all. For example the government has supported the development of a sustainable development strategy for the Oil and Gas sector but not for Telecommunications. The support that government can offer appears to be welcomed by the sectoral groups in creating more certainty over government strategy. This can have significant benefits in building consensus on policy issues regarding that sector. A lack of support has not prevented sectoral groups addressing

the issue of sustainable development. In such cases, for example BT, the group is lobbying for support by sponsoring a research programme into the future of telecommunications and its impact in terms of sustainable development. Again this activity is business-led.

The only effort in evidence from the public sector relates to one European-funded project. The role for government in raising consumer awareness and therefore stimulating demand for technological development could have a significant impact on corporate R&D programmes and partnerships for new product development. Venture capital financing could be targeted to sustainable products and designs but is not. Government could, but does not, support more academic research and commercialisation opportunities. The only real activity in relation to this type of work is being done by major world leading companies and again is a reflection of their proactive and competitive behaviour. This is a competitive business opportunity if demand exists or is likely to exist but the public sector despite describing innovation and sustainable development as priorities has failed to make the connection.

7.5.12 Social Responsibility

Social Responsibility: Businesses could potentially see themselves much more as part of the communities they operate in and around. The potential to engage with communities in a variety of ways which may not reflect core business needs or priorities would be a true reflection of corporate understanding of the complex relationships that can develop between companies and the areas in which they operate to the benefit of those communities.

Businesses are increasingly being viewed as entities that have an effect on and a responsibility to their immediate communities and a range of other people, from staff to consumers, through the process of their operations. The variety of impacts and the range of people affected are vast, as are the ways in which business can become more responsible. Much of the activity by its nature is highly localised making this area of sustainable competitiveness activity more area specific, and therefore more challenging to implement holistically.

Stakeholders are the strongest driver for corporate social responsibility, influencing most of the businesses interviewed. Business risk too can influence social responsibility but it is a factor linked strongly to the views of stakeholders in this case. However regulations also influence this in terms of human rights, health and safety and increasingly to conditions of employment. New market potential can also influence this but this appears to be a factor of the company's operating climate. In the case studies researched Scottish Power identified a market niche in developing a client base of low income people. It is possible that increasingly levels of accountability of business could lead to more stakeholder awareness of and engagement with companies over their social responsibilities.

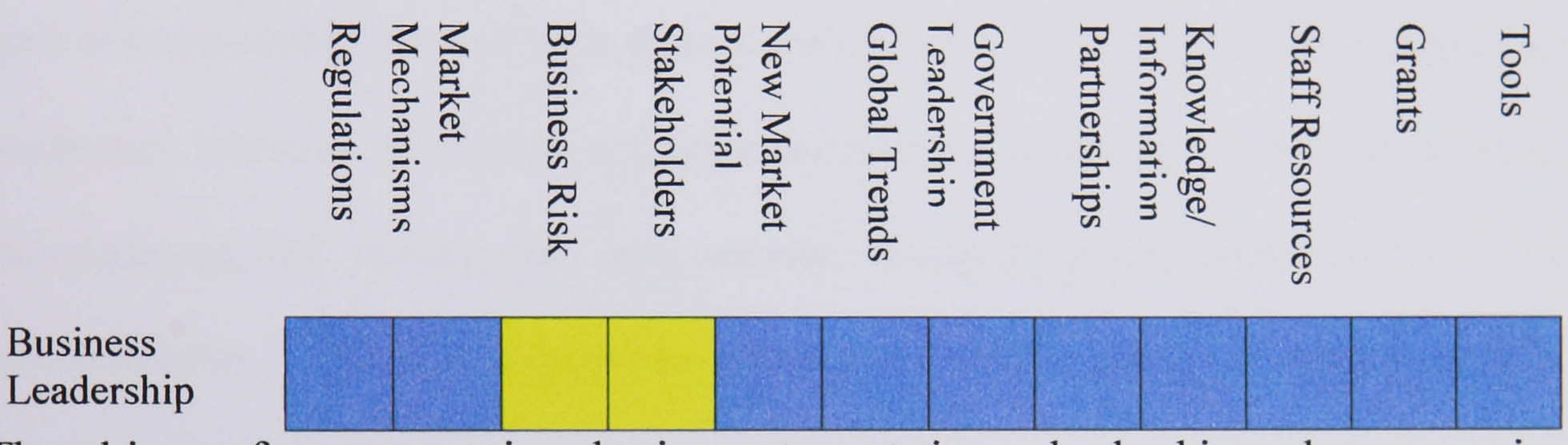
Owing to the highly local nature of social responsibility activities there is significant potential for government and especially local government or local government agencies to be involved in this work and to support it. To date however, there are very few examples of public/ private sector partnerships working on social responsibility. Government has made social justice a high policy priority in The Scottish Executive and it is an area of government that is heavily resourced. Despite the rhetoric on the social justice agenda government has done little to engage business in this area of work.

The competitive approach for business that stakeholders commonly associate with socially irresponsible behaviour is to become significantly more responsible. However the motivation is not so strong for companies that have not been subjected to such strong public opinion. Government is not undertaking public awareness raising sufficiently to encourage more dialogue that would encourage more socially responsible behaviour nor is it supporting such activities. Thus although the approach of public and private sectors is consistent, it is only a reflection of public policy not of public sector activity.

7.5.13 Business Leadership

Business Leadership is possible for businesses willing to engage with supply chains and other stakeholders and demonstrate and encourage good practice in terms of sustainable development supporting them to undertake activities they might not otherwise be able to undertake.

In order to change the way business operates across all business activity requires innovation in both management and in technical ability. However some companies, such as those interviewed, are prepared to take the lead in developing these new innovations. These businesses could encourage other companies to change their attitude and their behaviour to become more sustainable if these businesses were to act in a leadership role. There is huge potential for responsible companies to translate that responsibility to other companies, for example through supply chain initiatives. Here companies encourage suppliers to adopt the same ethics, values and principles as the lead company and apply them to their own operations.



The drivers for encouraging business to act in a leadership role are again stakeholders and business risk. It is possible that development of new markets will also create opportunity for dissemination of good practice to other companies. Some businesses are starting to ask that their suppliers adopt their ethics, values and principles to counter potential or perceived risk of being associated with companies that perform badly. This approach is limited by the interpretation of sustainable development by the lead company but has the advantage of being both focussed and motivational, taking SMEs beyond legislative requirements to retain a supplier contract.

There is enormous potential for government to find innovative ways to encourage business to act in a leadership role but this is not even on the policy agenda. The potential for government to support SMEs in supply chain initiatives through a partnership with the big leading businesses in this area is as yet unfulfilled.

The private sector alone is to a limited extent undertaking this leadership role, however it is only undertaken by large companies where the reputation of their suppliers can effect their own competitiveness. This again relates to high profile companies and those that have or potentially have issues about social responsibility and environmental practice with their stakeholders. The ability of the company to undertake business leadership activities relies upon it having undertaken strategy development and turning this into activity, engagement and increased levels of accountability. There is a possible role for the public sector in supporting this development and encouraging supply chain activity as a precursor to the introduction of legislation, regulations, or market mechanisms. Again the lack of apparent effort by the public sector in developing programmes that facilitate this approach is symptomatic of the lack of commitment to finding solutions to sustainable competitiveness.

7.6 Summary

To summarise, the public sector has taken a very weak role in increasing awareness and interest amongst the private sector in relation to sustainable development. The key messages it is using to promote involvement and engagement are centred on the eco-efficiency argument. The private sector sees a much wider potential role and is separately engaging with other businesses, through supply chains, on these wider

issues. These roles in engaging partners are complementary but not by design it appears. The roles of the sectors in relation to encouraging corporate visions and strategies to take sustainable development into account are contradictory. The private sector is most influenced by global events, where applicable to that company size and area of operation, given the lack of leadership evident from the UK and Scottish governments in this regard. A consistent approach to reporting is evident from the public and private sectors but again the delay in both the UK and the Scottish publication of sustainable development indicators has resulted in a missed opportunity to influence corporate reporting to date. The private sector is reasonably strong in this area but it is extremely limited by the number of companies involved in such proactive activities and the nature of the business that has been influenced, largely by global events, in this way. At the early stages of businesses becoming more sustainable, stakeholders do not appear to have much influence. The main drivers for activity are regulations, market mechanisms and business risk at this early stage. The main support that is being implemented is tools especially those designed to encourage reporting and stimulate partnerships. Government leadership is missed at this stage in business development and has the strongest potential to influence behaviour of companies, especially if it were to resonate with global trends and set clear direction on issues and their relative importance.

The reconciliation of effort by the public and private sectors in relation to efficient and responsible business practice is mixed. In regard to eco-efficiency the approaches of the two sectors are synergistic. In other areas of activity however the approaches of the two sectors are much more disparate. Complementary activity in

regard to turning strategy into action through decision-making and natural environment conservation is set against a lack of strategic context, such that complementary efforts appear to be accidental rather than planned. In regard to focussed engagement and accountability the public sector has altogether failed to reflect any strategic context in its actions and through its failure to act responsibly encourages a contradictory context for such activities. The efforts here by both sectors are limited and it is unclear whether or not they are achieving a responsible role or not for the business and industry sector.

The group of activities that demonstrates best practice shows the most promise for future sustainable development options through innovation. It perhaps should not be a surprise that the public sector role in encouraging this type of activity is extremely limited. The public sector however has the capacity to encourage this sort of activity as demonstrated in the example of new product and market creation. It also has the policy to back up action in this area as demonstrated in the analysis on social responsibility. On the whole the efforts made by the public sector contradict efforts made by the private sector in this range of activities where no effort exists at all on the part of the public sector. The private sector efforts are clearly innovative and are undertaken in a limited range of businesses that are particularly vulnerable to stakeholder pressures and perceive these as significant business risks. Such stakeholder pressures are often but not exclusively linked to global trends regarding views on consumerism, social responsibility in developing countries and global warming. This is an area where a significant difference to sectoral corporate

sustainability could be made if the public sector were willing to promote or support more activity that lead to this kind of practice in a wider range of businesses.

The government is strongly encouraging three things: eco-efficiency; engagement with stakeholders; and new products and market creation. Thus the government encourages engagement but fails to adequately encourage reporting and accountability. These different stimulants should be considered together to emphasise commitment to changing behaviour rather than increasing information with no structure for clarifying its real meaning. The government's approach is also strongly environmental with little regard for social considerations of sustainable business being given. A lack of clear leadership and direction of policy add further confusion to interpretation of sustainable business activity. Thus the government has failed to set up structures that facilitate real change and instead is simply creating the impression that it is taking action on creation of more sustainable business activity.

The analysis also suggests that government is willing to engage with business where it understands there to be a competitive advantage in doing so, but not where the gains of competitive advantage are less clear to the government, whether or not they actually exist. Thus the approach taken by the government is not innovative or progressive, failing to stretch concepts or practice to the next stage. Business is stronger on seeing competitive advantage more widely but is still weak on reporting and accountability as well as business leadership at this stage. The activity by business is much more focussed and specific than that encouraged by government. Additionally the public sector role in innovative practice is extremely limited. Improvements to government leadership for sustainable development could

strengthen innovation in this area. Business takes a much stronger role in innovation and this shows the need for both sectors to work much more closely together so that government can better understand how to stimulate more innovation for sustainable development.

Scotland's public sector role encourages eco-efficiency and consensus building engagement. These aspects of ecological modernisation theory are not however delivered to the extent that the theory suggests is possible and appropriate. The public sector also misses a key feature of an ecological modernisation approach, innovation. There would need to be development of the policy approach to align it with ecological modernisation theory. There are also further aspects of a sustainable competitive business approach extending the detail of ecological modernisation that are discussed in this thesis.

CHAPTER EIGHT: CONCLUSIONS

8.1 Introduction

Sustainable development is an important concept in helping decision makers take all aspects of their actions into account, particularly in regard to environmental and social issues and the long-term implications of such actions. Many governments around the world, including the UK, signed up to Agenda 21, which is a global agreement about how sustainable development can be implemented. Agenda 21 made distinctions between the responsibilities and potential actions of a number of major groups. One of these groups was the business and industry sector. This sector was represented at the 1992 United Nations Conference on Environment and Development (the Earth Summit) by a group of leading industrialists who took the opportunity to influence the content of Agenda 21. The role indicates that business did see potential in the agreement that suited business goals.

Understanding the potentially powerful role of business in implementing sustainable development leads to questions about how a more significant and effective role for business can be achieved. Competitiveness of business is a key consideration in requiring business to manage its responsibilities in sustainable development terms. A need to be competitive is what drives business to perform well and businesses attach a very high priority to achieving a competitive status. Competitiveness of business affects national competitiveness and so this concern also affects governments and national welfare.

This thesis aims to present a sectoral comparison of efforts to reconcile sustainable development and competitiveness in the public and private sectors in Scotland. An extensive literature review examined sustainable development and its potential and actual relationship to competitiveness in business as well as the policy context for sustainable development globally and in Scotland. The literature review is supported by data collection through a series of interviews with staff in both the public and private sectors. In each sector the interviews were carried out with representatives of organisations that were recognised for their good practice in relation to business and sustainable development. The outcomes of the interviews were analysed and the findings of this analysis presented in Chapter Seven. This final chapter presents the conclusions of the thesis, brings together all the findings of the literature review with those of the interviews and analysis and presents them in the following sections.

As illustrated in Table 8.1 following, which summarises the conclusions, the chapter is divided into four main sections. The three sections following this introductory section describe in detail the conclusions to the thesis. The second section describes conclusions regarding the concept of reconciling sustainable development and competitiveness. The third section presents conclusions regarding the policy framework for sustainable development and whether or not this promotes reconciliation of sustainable development and competitiveness. This section makes reference to the policy framework at a global as well as national level. A fourth section describes conclusions regarding policy implementation and whether or not the implementation of policy on sustainable development supports reconciliation of sustainable development and competitiveness.

RECONCILIATION OF CONCEPT
1. Sustainable development is a complex, multi disciplinary concept that is aspirational and progress towards it can only be achieved by setting priorities and involving a wide range of stakeholders in the process of decision-making and implementation.
2. Sustainable development and competitiveness can theoretically be reconciled in some regards whereas in others reconciliation is dependent on the situation. There are some features of sustainable development that appear to be entirely contradictory with the goals of competitiveness.
3. Sustainable competitiveness is a concept describing an area of business competitiveness that positively contributes to sustainable development. It is principally about resource management and establishing conditions that enable a competitive approach to be more sustainable and has a number of features such as eco efficient product lifecycles, product and market creation for more sustainable lifestyles, social responsibility and business leadership. It also reflects accountability of business and focussed engagement with stakeholders.
POLICY FRAMEWORK
4. Agenda 21 sets the global policy framework for delivering sustainable development. Agenda 21's approach is strongly linked to a competitive approach encouraging trade and economic growth. However it fails adequately to address some issues fundamental to sustainable development: consumption, resource depletion, equity and an increasing dependence on international trade. These are notably all the features of sustainable development that are externalities to sustainable competitiveness.
5. The European public policy framework focus on production processes and efficiency, and the UK and Scottish interpretation of that, has a significant role in driving sustainable competitiveness, but it is too limited to achieve it. The UK and Scottish policy framework fails to address the key issue of innovation in driving more sustainably competitive business.
6. Policy must find ways to address the sustainable development externalities to sustainable competitiveness, such as consumption, equity and protection of the natural environment.
7. The policy framework as it stands means that good practice in business is limited to certain types of business at this time. However the increase to competitiveness in the SMEs interviewed resulting from a more sustainable approach indicates that an extended framework and application could result in more competitive business operations.
IMPLEMENTING POLICY
8. The political feasibility of sustainable development is limited by the approach of government in Scotland. This approach is limited in terms of lacking leadership, little consensus building internationally and locally, and a weak approach to creating drivers and support mechanisms for sustainable competitiveness. There is also no framework for addressing the sustainable development externalities to sustainable competitiveness.
9. The business and industry sector has a key role in ensuring the technical and financial feasibility of Agenda 21 and a more significant role in the implementation of sustainable development than Agenda 21 indicates. Business and industry has a key role in improving the state of the world and harnessing energy and innovation as well as generating wealth to achieve that. The business and industry sector has a key role in ensuring the technical and financial feasibility of Agenda 21 through sustainable competitiveness.
10. Policy in Scotland needs to evolve to take advantage of the potential inherent in the concept of sustainable competitiveness. The right conditions for engaging business in sustainable competitiveness are: ▪ Links from sustainable development strategy to social justice agenda ▪ Emphasis on encouraging innovation for sustainable development ▪ Consumer awareness raising and consensus building ▪ Accountability in companies relating to sustainable development ▪ Back up policy statements and voluntary agreements with legislation and market mechanisms ▪ Sending a wider message about how sustainable development is good for business.

Table 8.1: Conclusions

A fifth and final section presents recommendations arising from the conclusions that have been reached splitting them into recommendations to improve policy and its implementation. Table 8.1 above summarises the conclusions and presents them in relation to the sections following where they will be described in more detail.

8.2 Reconciling the Concepts

8.2.1 The Concept of Sustainable Development

Sustainable development is a complex, multi disciplinary concept that is aspirational and progress towards it can only be achieved by setting priorities and involving a wide range of stakeholders in the process of decision-making and implementation.

Sustainable development is about the integration of economic, social and environmental considerations and striving for development with a view to the long-term implications of decisions. It is a complex and multidisciplinary concept. Sustainable development is a concept that grew out of concerns about increasing environmental degradation and changing values reflecting increased interest in the natural environment. However sustainable development is not solely about addressing environmental concerns but about finding ways to integrate these issues with others more commonly addressed during the decision-making process, i.e. economic and social considerations. The need to integrate these issues creates a need to consider potentially conflicting values and difficulties in establishing priorities.

Sustainable development can be characterised by its inherent conflicts:

- the complex features of the interconnected nature of problems across traditional disciplines,
- the longevity of the issues that require consideration,
- the significant role of personal values,
- the challenge of considering global pressures while addressing local and national ones,
- the challenge of being equitable while seeking economic growth, and
- the uncertainty of the outcomes of any efforts to implement sustainable development.

Section 2.3 of Chapter Two describes the contradictions inherent in sustainable development more fully. As a result of its complexity the concept of sustainable development does not provide any insight into best means of implementation or priorities. Economic solutions have been suggested that rely on the current systems of wealth generation and the potential of innovation to resolve any problems before they reach an unacceptable level. This does not resolve the issues of uncertainty of outcome nor of integration of social and environmental concerns into decision-making. Advocates of sustainable development suggest that other solutions might be possible. The UNCED, where Agenda 21 was agreed, was a first step in opening debate on potential solutions and priorities. Sustainable development cannot be achieved without clear statements on values of those affected by decisions and strong leadership to balance priorities.

Sustainable development has proved to be a complex mix of objectives that links together economic, social and environmental interests across different countries and across a long time line. Sustainable development is currently about meeting needs, and particularly basic needs in developing countries. It also has an evolving nature and the concept can be used to address other problems such as inequity in distribution of wealth once such needs are met.

8.2.2 Theoretical Reconciliation of Sustainable Development and Competitiveness

Sustainable development and competitiveness can theoretically be reconciled in some regards whereas in others reconciliation is dependent on the situation. There are some features of sustainable development that appear to be entirely contradictory with the goals of competitiveness.

Industrial ecology and ecological modernisation explore practical and theoretical options for implementing sustainable business. Ecological modernisation encompasses the activities typical of industrial ecology. The theory of ecological modernisation, involving eco-efficiency at a product and geographical level, consensual policy making and innovation, does not offer detail on all aspects of a competitive sustainable business developed through the matrices in chapters Four, Five and Six. The aspects of sustainable business activity not well developed in the theory are social responsibility, natural environment conservation and business reporting and accountability.

The research presented in Chapter Two of the thesis identifies the potential for reconciliation of sustainable development and competitiveness. Competitiveness is definitely compatible with the economic needs of sustainable development. Where innovation is focussed on efficiency or on making products that suit sustainable lifestyles then innovation is compatible with sustainable development. However, where innovation increases consumption and demand it is incompatible with sustainable development.

Increasing trade and wealth may facilitate conservation and/or sustainable management of resources where it encourages materials substitution or where it encourages innovation that is beneficial to sustainable development goals. Conversely increasing trade and wealth may harm resource conservation and/or management where it results in the migration of dirty industries and increases consumption levels. Efficiency in natural resource use, a feature of competitive behaviour, also may reduce overall consumption of natural resources or it may create wealth used to innovate and increase consumption levels. Chapter Two describes and illustrates the feedback loop between consumption and innovation.

There is no ambiguity over the negative impact of use of natural resources and trade on equity. In both cases each has a negative effect on equitable distribution of resources, particularly where further generations are considered, and on enabling access to goods. However where either of these activities creates wealth there is always the possibility that a more equitable distribution of wealth can be managed.

Increasing wealth (for example through increased trade) is often considered to be the best way to address social needs.

Table 2.1 in Chapter Two also highlights the shortcomings of competitiveness as a solution to sustainable development indicating that the two may only ever be reconciled on a very limited basis. These shortcomings are in terms of decision-making and longevity. Decision-making for sustainable development is only possible when the values and priorities of all stakeholders are taken into account. This includes local level as well as national and global priorities. It is not solely dominated by business related and national priorities as consideration of competitiveness often is. In addition the ambiguity over the relationship between competitiveness and the environment, as indicated in the above paragraphs, demonstrates that long-term considerations may not be possible in a decision-making climate that favours competitiveness above all else. Long-term considerations relating to resource management are likely to be more cautious than a competitive approach would encourage. Whether or not such decisions are possible depends on the specific circumstances of national priorities, decision-making processes and values of citizens that can inform these two factors. Chapter One notes that the uncertainty over values creates difficulties for decision-making and creates a need for more engagement. This can be compatible with a need to be clear about values for business competitiveness.

If it is accepted that increasing consumption levels, protection of the natural environment and inequity need to be addressed by government rather than business and industry, then it is possible to define a new concept that outlines the role of

business and industry in sustainable development. This concept is sustainable competitiveness.

8.2.3 The Concept of Sustainable Competitiveness

Sustainable competitiveness is a term describing an area of business competitiveness that positively contributes to sustainable development. Sustainable competitiveness has a number of key features such as an eco-efficient product lifecycle, new product and market creation for more sustainable lifestyles, social responsibility and business leadership. It also reflects increased accountability of business and focussed engagement with stakeholders.

Sustainable competitiveness is principally about resource management and responsible business operations, requiring a policy framework that enables a competitive approach to business to be more sustainable. It facilitates innovation that supports increased efficiency and design for more sustainable lifestyles but does not increase consumption or demand. It contributes to decision-making for sustainable development through increased accountability and engagement. A sense of corporate responsibility is encouraged to address the longevity of business strategies in a sustainable development context. It is also about supporting the increase of wealth through business activity for the purposes of supporting more sustainable development.

Sustainable competitiveness is a concept that could drive more sustainable practice in the business and industry sector. The concept is aimed at harnessing the energy, innovation, global connectivity and productivity of the business and industry sector

in an increasingly competitive global market to create competitive advantage by delivering more sustainable products and lifestyles in more sustainable ways. It also requires a policy framework that facilitates thereby establishing a role for governments. Sustainable competitiveness involves the following activities:

- Focussed engagement with stakeholders enabling them to inform corporate strategy
- Increasing accountability of sustainable activities
- Life cycle efficiency of production and use of goods and disposal
- Production of goods that promote and enhance sustainable lifestyles amongst consumers and innovation in design and marketing of goods which facilitate more sustainable lifestyles amongst consumers
- Social responsibility
- Exertion of business leadership in encouraging similar practice in suppliers and in technological transfer
- Taking a long-term view in decision-making regarding natural environment and social impact of corporate activities
- Redistribution of wealth generated by competitive business to increase social justice, equity and natural environment conservation and management
- Consensus building by government with other nations, businesses and industry and citizens for sustainable development to set a policy framework for sustainable competitiveness and encourage more demand and competition in sustainable competitiveness activities.

Sustainable competitiveness differs from ecological modernisation in that it takes into account the role of business drivers, rather than focussing on public policy approaches, many of which are currently having only a limited impact in practical terms of increasing the sustainability of business operations in Scotland. Such business drivers are increasingly motivated at a global level and even where they take a more national approach the drivers like stakeholder pressure and new market potential are features that government chooses not to influence. Equally sustainable competitiveness notes a role in business leadership that is not clearly identified in the theory of ecological modernisation. Issues such as natural environment conservation and the role of business reporting and accountability are also not yet firmly embedded into the theory of ecological modernisation, while the lack of focus on social responsibility remains a topic debated in the development of the theory.

There is significant variation in the ways in which competitive edge can be gained for different sectors of business and within business sectors and this variation is also a feature of sustainable competitiveness. Specifically competitive edge is gained from differences in operation not similarities and so sustainable competitiveness will feature many different combinations of the above features and some will translate more effectively to certain sectors of business than others. It should also be recognised that sustainable competitiveness is not a finite solution to sustainable development. There is no end point to sustainable competitiveness and where the practice identified above has been adopted it can be said to have been achieved to some extent, its potential can never be said to have been exhausted. Essentially the highly innovative nature of sustainable competitiveness means that as good practice,

such as that described in Chapters Four, Five and Six, becomes more widely adopted, the competitive edge will need to be sought from further innovations and adoption of practices. Such practices are as yet either unknown or not readily applied because they are currently anti-competitive.

Chapter Two notes that sustained productivity growth requires that an economy continually upgrades itself and so that economy requires the ability to compete successfully in entirely new and increasingly sophisticated industries. This too is a feature of sustainable competitiveness. As competition increases the competitive edge can be gained from activities that may have previously been perceived as anti-competitive.

The way to increase sustainable competitiveness is therefore to increase competition within a suitable framework for more sustainable decision-making. It should be noted that as the sophistication of consumers increases and more sophisticated products emerge to address increasing consumer demands, the traditional competitors in business sectors may become superceded by a need to compete with other business sectors. For example, telecommunications could ultimately compete with the transport sector by reducing the need to travel.

8.3 Policy Framework for Reconciliation

8.3.1 Agenda 21

Agenda 21 sets the global policy framework for delivering sustainable development. Agenda 21's approach is strongly linked to a competitive approach

encouraging trade and economic growth. However it fails adequately to address some issues fundamental to sustainable development: consumption, resource depletion, equity and an increasing dependence on international trade. These are notably all the features of sustainable development that are externalities to sustainable competitiveness.

Agenda 21 presents a complex mix of goals to achieve sustainable development. Agenda 21 suggests ways that such needs and inequities can be addressed as well identifying key groups that need to be involved to support this process. Agenda 21 therefore recognises that its objectives are not just the responsibility of government although governments have a lead role in co-ordinating and leading on activity to meet the objectives. It seeks to manage the complexity of linkages between cause and effect and the difficulties in reliance on hard data noted in Chapter One (Section 1.3) by taking a highly strategic overview of the issues.

Business and industry is one of eight groups of major contributors identified in Agenda 21 and the one with a key role in developing and implementing some of the more innovative solutions that Agenda 21's successful implementation will require. Business and industry is also a key group in terms of its transnational position and its ability to engage in consensus building over a number of different locations.

There are many possibly contradictory challenges in meeting the objectives of Agenda 21. Not least of these is the position that was agreed in regard to economic development. Although many environmental campaigners dominate the discussions

regarding sustainable development and argue that economic growth is not sustainable, Agenda 21 demonstrates a commitment to economic growth and trade as a priority. Agenda 21 also requires global co-operative working as many of the objectives are transboundary and therefore requires governments and other key groups to work with international goals in mind rather than just national ones.

Both North and South lobbied for Agenda 21 to take account of their interests in relation to more growth, trade, aid, science, technology and management. The unilateral agreement by nation states on these priorities ensured that Agenda 21 promoted solutions to sustainable development in line with the competitive perspective by emphasising the importance of free trade. Innovation is also strongly encouraged by Agenda 21, very much in line with this competitive approach. However the emphasis on innovation in Agenda 21 is often in regard to increasing efficiency rather than changing lifestyles. As noted in Chapter Two the impacts of trade and globalisation are good for innovation but Agenda 21 does not address the potential negative impacts of trade and globalisation on environment and welfare.

Agenda 21 has failed to address the most challenging features of sustainable development: consumption, resource depletion, equity and an increasing dependence on international trade. These features are notably the sustainable development externalities to sustainable competitiveness and trade is a vehicle for increasingly competitive activity. This suggests that imaginative implementation of Agenda 21 would result in sustainable competitiveness but not in sustainable development. A further limit to the implementation of Agenda 21 is its facilitation of national and

local activity rather than international activity. Consequently, it weakens the international approach to sustainable development, limiting capacity to achieve sustainable competitiveness by removing implementation from the international agenda.

Agenda 21 is not prescriptive about how it should be implemented and leaves much of this open to interpretation. The implementation is difficult to visualise and will require a lot of innovative working. Despite offering suggestions about types of implementation that might be useful, Agenda 21 sets no definite targets and so monitoring progress is difficult. Monitoring progress is generally undertaken by the Commission for Sustainable Development and the reporting to the five yearly conferences which have been held subsequent to the original Earth Summit in 1992.

8.3.2 EU, UK and Scottish Policy

The European public policy framework focus on production processes and efficiency, and the UK and Scottish interpretation of that, has a significant role in driving sustainable competitiveness, but it is too limited to achieve it. The UK and Scottish policy framework fails to address the key issue of innovation in driving more sustainably competitive business.

Much of the emphasis placed on sustainable competitiveness activity in Scotland has been a result of the strong public policy focus at a European level on eco-efficiency and pollution control measures. Where this approach has been successful to some extent in creating awareness amongst businesses about the opportunity for increased efficiency measures, it has not promoted any additional ways of being more

sustainable to businesses. This approach considers the European policy agenda of creating greater economic growth and also of decoupling growth from natural resource use since natural resource use is seen to be an uncompetitive basis for the economy. The eco-efficiency is in part a reflection of the apparent misunderstanding amongst key government representatives that the only way to positively affect competitiveness in relation to sustainable development is through efficiency measures. This reflects a somewhat limited view that the only way to influence business competitiveness is through simplistic profit oriented bottom line measures. In fact, as has been demonstrated earlier in this thesis, there are many other ways to affect business competitiveness with positive outcomes for business which are more sustainable, reflecting the proposal made earlier in this section that sustainable competitiveness is a multi-faceted and realistic proposition that some businesses are starting to address through their business planning. The emphasis on eco-efficiency as the only link between businesses and sustainable development does not address the drivers that will influence product design, creation of new markets, community based work and more social responsibility all of which can be parts of a sustainable competitiveness business strategy. In fact, of these drivers, government in Scotland does not admit to being responsible for or able to implement anything that encourages sustainable practice in this area as indicated by the policy framework described in Chapter Five. With a clear vision, government would be in a stronger position to influence these external factors in favour of sustainable development. The lack of encouragement of voluntary agreements prior to implementation of legislation precludes a more innovative approach to addressing equity and natural environment issues.

Scotland's policy approach indicates an emphasis on eco-efficiency but not one that encourages full life cycle industrial ecology. The approach also demonstrates consensual style policy making to a limited extent (Shell's participation in the Cabinet Sub Committee on a Sustainable Scotland (CSCSS)) and the lack of encouragement of voluntary agreements indicates the limited extent to which ecological modernisation is embedded in policy delivery. The approach also does not encourage an innovative approach to business in terms of sustainable development. As such the approach taken falls short of an ecological modernisation approach, which in itself does not detail enough features to fully encourage sustainable competitiveness.

In addition to the limited perspective currently employed by the Scottish Executive and the UK Government, there is a further point about an over dependence on eco-efficiency that has come through the analysis in this thesis. This is that the drivers and support mechanisms that promote eco-efficiency are not the same ones that produce incentives for implementation of the other sustainable competitiveness activities. An over emphasis on eco-efficiency as the only means to engage business in sustainable development is extremely limiting in that it rarely leads onto additional activities. The eco-efficiency approach also fails to address levels of consumption of non-renewable or depleting resources by focussing attention on efficiency and not on the sustainable development implications of production or over consumption of goods once produced. Thus while the approach towards eco-efficiency is sound in some respects it is highly limited and not likely to enable the business sector to

contribute to sustainable development to the extent that it has the potential to without being anti-competitive.

Chapter One notes that innovation is an uncertain solution to sustainable development but it is a good solution if it is undertaken in a sustainable development value based culture and the leadership for setting this basis for innovation exists. In addition Chapter Two noted that competitive advantage is no longer factor based and the pressure for companies to innovate is becoming more intense. The BCSD report, described in Chapter Two, seeks to confirm that public policy will create an environment that stimulates innovation. Agenda 21 took on board all the BCSD's comments but this particular aspect of Agenda 21 has failed to translate recognisably into Scottish policy. In terms of encouraging innovation and consumer demand the government again is doing little to encourage more sustainable consumers or innovation in business that can address and encourage more sustainable lifestyles.

The approach taken by the Enterprise Network in Scotland is one that offers grant aid and advice to businesses, particularly with a remit, among other things, to encourage new business start-ups. It takes a very limited role in promoting sustainable development and demonstrates a lack of understanding of the potential for sustainable competitiveness. The use of resources applied to such business support could have a longer-term benefit for the businesses if it were used to influence the drivers of sustainable competitiveness. This lack of long-term vision prevents the support of a process that would have the effect of stimulating innovation and competitiveness amongst businesses in Scotland.

There is also scope to harness the energy and innovation of big business and use that to lead development of more sustainably competitive practices amongst smaller businesses. The analysis to date shows that companies most inclined towards sustainable competitiveness are globally competitive. However, Scotland is potentially at a disadvantage in becoming more sustainable because it is not sufficiently competitive to attract business that will proactively pursue sustainable competitiveness. Although Scotland is the home nation for some globally competitive companies, these are companies that are currently tied to Scotland for its natural resources. Developing the theory presented earlier that globally competitive companies are the leaders in any movement for change in business practice then if Scotland were able to attract more leading companies by being more competitive, it could be in a better position to create a more sustainable Scotland. Drawing from the conclusions of Chapter Two, nation states power is now from competing for investments of TNCs in terms of providing a large and growing market for goods and services. This can be capitalised on by ensuring that that nation has all the facilities, services and qualities required by the investor both for business and quality of life, then sustainable development approaches could lead to longer-term increases in competitive advantage of nations.

8.3.3 The Externalities of Sustainable Competitiveness

Policy must find ways to address the sustainable development externalities to sustainable competitiveness, such as consumption, equity and protection of the natural environment.

Ultimately sustainable development policy, through Agenda 21 and at the EU level, makes efforts to decouple environment from social and economic behaviour. However where this may tackle the ethico-social limits identified by Daly (1980) in Chapter One, the use of chemicals and plastics makes it very difficult to address the biophysical limits, also described in Chapter One. In effect current policy is doing little to even start to address the complex issue of human consumption that is putting increasing demand on sciences like plastics development and biotechnology. The future impact of these sciences and the consumptive practices that encourage their further development can only be guessed at present. This is a classic example of where the precautionary principle should be applied but as yet, appears not to be. This issue too may have significant effects on the natural environment and on future generations but a policy dialogue on these matters is not, at this stage, accessible to the citizens who will be affected by them.

The lack of clarity over the issue of equity as it relates to sustainable development draws attention to the possible conflict between equity and economic growth as it is currently managed. Equitable distribution of food and natural resources would require an end to protectionist policies and a radical restructuring of trade and pricing of goods systems as indicated in Chapter One. Because the concept of sustainable development and the policy of Agenda 21 is so clearly based on achieving economic growth, neither addresses the equity. Consequently policies that flow from sustainable development and Agenda 21 do not adequately address equity either.

Chapter Two notes that the BCSD puts responsibility for management of the natural environment firmly with national governments. Nothing in Agenda 21 disputes this. However Chapter Two also notes the link between natural resource use and global inequity, as well as the link between innovation and economic growth and increasing levels of consumption of natural resources. The discussion on TNCs and SMEs in Chapter Two also highlights the danger in taking a nation-based approach to natural resource management. Governments really need to address natural environment issues globally increasing the importance of consensus building and possibly of global regulations.

Sustainable competitiveness offers a key role to business in implementing sustainable development but even at its most holistic and innovative, that role fails to address consumption, equity and often natural environment protection. Consequently government intervention is required to introduce limitations and address needs that relate to increasing equity in relation to social order. In addition policy makers require to find ways to prioritise issues given their constrained resources and to set the priorities in line with values that relate to social justice and environmental limitations. Clear government leadership, policy and limitations in these areas are more important than in other areas where there is at least potential for competitive approaches to business to address them.

8.3.4 Limitations to Current Policy Framework

The policy framework as it stands means that good practice in business is limited to certain types of business at this time. However the increase to competitiveness in the SMEs interviewed resulting from a more sustainable approach indicates that

an extended framework and application could result in more competitive business operations.

The companies that are really engaging with sustainable competitiveness are those that have been key targets in a synergy of drivers and support mechanisms. The key feature, which has influenced decision-making and more sustainable practice in each company interviewed, was energy. In the major oil and gas and energy supply companies it was perceived as a business risk in relation to stakeholders perceptions in regard to social responsibility and longevity of supply. Such risk features have motivated these companies to seek potential diversification of products and investigate new market creation. These companies are developing long-term business strategies for retention of their competitive position. Risk also extends to stakeholders' perceptions of the company and has prompted business leadership in encouraging suppliers to implement measures more in line with these companies' strategic visions. At the same time the legislative climate regarding energy supplies and the global public policy pressures regarding longevity of supply and climate change risks have also come to the fore creating further pressures. These risks synergistically combine to create rising fossil fuel prices and consequently raise customer and stakeholder awareness of the issues. This unique combination of pressures is driving proactive companies working in this sector to seek opportunities for business diversification and resulting in a sustainable competitiveness approach to business.

In the other companies energy has been a major issue for each company predominantly in relation to the amount of energy used by that company, as a significant eco-efficiency driver. In these cases the pressure relates to the cost of supply of energy and so these companies are not subject to the same level of pressure about becoming more sustainable through the types of best practice measures that appear to be more typical of the energy supply and production companies. For companies using significant quantities of energy, the pressures relating to global energy supplies translate to eco-efficiency measures only in these companies.

Other than energy, there is no similar single-issue driver that has had this impact on such a wide range of businesses and in such a sustainable and competitive way as energy. However it is also worth reflecting at this point that there has been no global policy drive with focussed attention on a single issue, nor has any single-issue topic, other than energy, caused such a global threat to the economy of all countries. Energy as a subject and a driver for change can be seen to be unique in this sense. Therefore if further drivers for such sustainable competitiveness action are desirable then alternative means to create pressures on this scale, not only of importance to economic systems but also to so many governments, need to be clarified and prioritised.

For smaller companies the pressure to become more sustainably competitive is a trade off against business survival putting these companies into quite a different position than the larger ones. This is where the role of government-led support mechanisms comes in. In these cases the drivers affect SMEs in a similar way to

larger, better-resourced companies but the reaction of the SMEs is quite different. Without support, such as that described in the previous sections many of these businesses may fail. This is where the argument against further environmental and social responsibility regulations as being anti-competitive is seen most strongly. In these cases the drivers for change can encourage sustainably competitive behaviour but smaller companies must be supported to facilitate their implementation. As noted in Chapter Six, SMEs are less able to take advantage of opportunities than big companies and less able to innovate for sustainable development. Spin-offs from the support mechanisms being employed were found to be improved public/private partnerships and more forward-looking companies, that is companies that were becoming more competitive. In fact the interviews found that these companies became significantly stronger by becoming more competitive and so contrary to the financial supports that can perpetuate an unsustainable company, sustainable competitiveness measures might actually make the company more competitive weakening the argument against implementation of further drivers such as legislation and market mechanisms. Contrary to the BCSD view described in Chapter Two, more regulations for environmental protection could lead to a more competitive approach for business. What can be concluded is that where such mechanisms are going to be introduced by government, the support mechanisms are an essential part of making their introduction successful in every sense: economic, environmental and social.

8.4 Implementing Policy

8.4.1 Weakness of Political Feasibility in Scotland

The political feasibility of sustainable development is limited by the approach of government in Scotland. This approach is limited in terms of lacking leadership, little consensus building internationally and locally, and a weak approach to creating drivers and support mechanisms for sustainable competitiveness. There is also no framework for addressing the sustainable development externalities to sustainable competitiveness.

8.4.1.1 Leadership

In practice business appears keen for government to establish a clear direction and finds it to be absent. The business sector, with the exception of the locally based SMEs, looked towards the UK strategy for leadership and vision finding strategic direction from Scotland lacking. The business sector noted that the UK strategy lacked clarity and direction and stated that a more sector-based approach would offer clearer direction for the purposes of planning corporate strategies. The lack of vision from government does not appear to have hampered the efforts of big business to understand and apply sustainable development ethics, values and principles to their corporate strategies. The same companies that are incorporating this into their strategies are reporting on them and so ultimately as they become more accountable will provide more evidence to support understanding of how these principles are being implemented in practical terms. These efforts however result from pressures

on companies in terms of global trends, potential for new market opportunities and risk management.

There are a lot of unrealised potential benefits to be gained from use of reporting not only as a means to establish clear leadership from government on sustainable development. Reporting can also act as a means to communicate cross-sectoral linkages, the holistic nature of sustainable development and a tool to increase partnership working. These are missed because government has not set itself a clear vision and strategy and reporting on sustainable development in Scotland particularly has not, to date, been undertaken. The failure to report and monitor means that Scottish government is not accountable in regard to progress on sustainable development. It is therefore is a weak position in regard to encouraging business to be more accountable. The UK government is in a stronger position than the Scottish government given the bi-annual publications of UK Sustainable Development Indicators. The data on these is not available at a Scottish level however.

The government leadership demonstrated in terms of signalling forthcoming legislation and market mechanisms exists but the limited scope of the forthcoming measures means that a communication of direction beyond the eco-efficiency role does not exist. The lead is from Europe and the UK and Scotland's reactive approach to that further indicates a lack of leadership.

Further synergies are possible and what has not yet been explored is the potential of partnerships between business and government in creating a synergy that will drive

forward sustainable competitiveness. The process of change occurs where first mover business leaders take risks and implement new ways of working. Not all companies are proactive and less proactive companies will need more drivers and supports to encourage sustainable competitiveness behaviour. The business leadership support acts much as government leadership does in providing a framework and where a supply-chain relationship exists there is a motivation for action. The support mechanisms offered by government have significant potential for being used more effectively if delivered in partnership with bigger and more proactive businesses. This should be set in a stronger context of regulations and market mechanisms to ensure firm leadership.

This demonstrates the need for a compatible approach between vision and leadership in terms of sending signals about forthcoming legislation or market mechanisms. It also demonstrates that to ensure successful implementation of such mechanisms for smaller companies, exemption for smaller companies is not the most sustainable solution. With certain supports smaller companies are able to make the changes necessary both to meet requirements of legislation and to start to understand the longer-term nature and benefits of sustainable development for their company.

8.4.1.2 Consensus Building

It is important to note that globalisation has eroded the ability of government to control and influence local activities and this is especially the case where business is responsive to so many other pressures. However this increasing lack of control is a key reason for taking a lead role in consensus building and in setting the trends rather than having to follow them. As noted in Chapter Two the shift of innovation from a

knowledge-driven activity to a market-driven activity makes the role of consensus building central to progress on sustainable competitiveness since this and sustainable development are so heavily reliant on innovation. Additionally the lack of binding implementation tools in Agenda 21 leaves agreements open to influence and consequently makes consensus building an important role.

There is little evidence to suggest that the Scottish government is engaging with the UK government on sustainable development issues or that it is seeking to participate in debate and consensus building in the European or global context. The delay by the Scottish Parliament to produce any strategy on sustainable development despite the UK having produced such a document is evidence to support the claim that the Scottish government is not taking up its role in this level of engagement with other governments. The role of the UK government in international consensus building arrangements therefore becomes much more critical to Scotland but it too is weak. Much of the policy work and consensus building is being effected at the European level and thus is subject to the interests of the leading and most proactive countries in sustainable development within the EU. It appears that the UK's role in consensus building and partnerships to develop sustainable competitiveness is only proactive in relation to eco-efficiency and not as holistic as it could be. Efforts to be seen to do things differently in Scotland from the UK and create a Scottish identity for policies have created a vacuum of ideas, initiatives and action in relation to sustainable development. Consequently the role of government in influencing global trends as a driver for sustainable competitiveness appears weak.

Business is keen to engage in consensus building with government granting it the opportunity to influence policy implementation and future policy direction while at the same time gaining a clear view of the direction which government expects policy to go. The global businesses have become especially good at this process of consensus building, securing positions of key influence on influential policy groups. The UK government's efforts to create sectoral sustainable development groups offer opportunity for consensus building but this approach is not extended to all business sectors.

Consensus building can also have an important role in implementing policies at a more local level through a partnership approach between government and local businesses. Partnerships between the private sector and the public sector have had the definite impact of encouraging business to turn strategy into action, incorporate ethics, values and principles relating to sustainable development into decision-making and to become more eco-efficient. Spreading knowledge and understanding of the business benefits of eco-efficient production has also had an impact in supporting good practice through increased partnership working. The partnership approach has had the strongest impact on SMEs where new legislation has required those businesses to change their operating practices indicating that consensus building can only be effective within a clear strategy framework for sustainable development.

8.4.1.3 Drivers and Support Mechanisms

Government has a potentially strong role in influencing consumers to create demand for more sustainable lifestyles. However, when questioned on the matter government

felt it did not have a particular role here. The central question is whether or not government leads public opinion or is led by it. In the case of sustainable development a strong role in education for sustainable development would be responsible behaviour by government but efforts in this area are not a current priority. Government efforts in influencing public opinion through awareness raising have only recently started through a television advertising campaign in Scotland. This is nine years on from the original commitment at the Earth Summit and the delay in action suggests a lack of commitment. Other efforts which could, within the remit of the Scottish Executive's priority policy initiative to promote community capacity building and social inclusion, be given a priority as a means to communicate sustainable development messages are only being undertaken on a project basis and it is not yet clear whether they will reach the mainstream.

There is some scope for synergy between the public and private sectors in marketing and product development as it relates to sustainable development. However this will not be realised unless government changes its perception that it has no role in encouraging specific types of product development in industry. The potential here is for conflict between the two sectors in their approaches to this area of work. Government has a lot of potential in creating knowledge and research but while it applies it to other areas of activity it does not apply it to sustainable development lifestyles.

Businesses rather than government are taking on the role of creating demand for their products. In some cases these are potentially compatible with sustainable

development but in the majority of cases this is not so. It also means that the full range of socio-economic considerations is not being given to product development enabling companies to create demand for products that may or may not be compatible with sustainable lifestyles. Until government takes a stronger role in leadership for sustainable competitiveness, the business and industry sector will continue to base its decisions on other more concrete influences. To date some of these influences are leading towards sustainable development, for example in the area of energy as discussed earlier, but on the whole this is not the case.

The role that government could have in supporting businesses to become more sustainable and consequently in many cases more competitive was described in Chapter Five. However it is important to note that government is not taking a strong role in terms of development and implementation of such support mechanisms even where their use has proved to create more competitive and sustainable companies. The role that government has had in support mechanisms is a limited one in relation to project-based and grant-funded programmes in a limited number of areas. These examples only relate to efficiency measures and have been most effective where they are supporting implementation of new processes and installation of new equipment to mitigate the measures of forthcoming legislation. Despite the success of these projects the government has not taken any role in a wider application of the approaches that make these projects successful. In relation to the other support mechanisms that were suggested, again the government's view is that despite any success they might have had they are as yet undeserving of central government funding to support their further development.

8.4.2 Role of Business in Securing Technical and Financial Feasibility

Business has a more significant role in the implementation of sustainable development than Agenda 21 indicates. Business and industry has a key role in improving the state of the world and harnessing the energy and innovation of business as well as generating wealth to achieve that. The business and industry sector has a key role in ensuring the technical and financial feasibility of Agenda 21 through sustainable competitiveness.

Business and industry is one of eight key groups in Agenda 21, the only global policy document that sets a framework to enable implementation of sustainable development. Frequently analysis of the delivery of Agenda 21 has focussed on understanding the role of national and local governments and Agenda 21 itself states that some 80% of Agenda 21 should actually be delivered at the local level (Local Agenda 21) thereby giving responsibility to local authorities as significant delivery agents of Agenda 21 in practice. A very proactive consensus-building approach led by the business and industry sector in the negotiations preparing papers for the Conference at which Agenda 21 was agreed appears to have prevented full consideration of the role that this sector can play in delivering sustainable development. In Scotland local authorities have designated responsibility for Local Agenda 21 to officers in the local authority. However a lack of understanding of how to harness the energy and innovation of the business and industry sector combined with a perceived lack of responsibility in this area by this group appears to have prevented much action in this area.

Sustainable competitiveness is more extensive than the role for business and industry that is outlined in Agenda 21. In Agenda 21, the role for business and industry has two key features. The first is promoting cleaner production, which translates broadly to eco-efficiency at the production level. The second feature is promoting responsible entrepreneurship. This second feature is general enough to have broad resonance with sustainable competitiveness but the specific objectives that Agenda 21 sets out to clarify this feature are sufficiently narrow to prevent such resonance. What Agenda 21 fails to address as a role for business and industry are all the social aspects of business behaviour, accountability and engagement and anything that can be described as best practice in sustainable competitiveness, such as business leadership and new products and market creation.

Agenda 21 reflects the views of many countries in asserting that economic growth is a key goal. Economic growth is also a primary driver for the European Union. Globally all nation states argue that economic growth creates wealth and increases competitiveness generating confidence and further wealth in each country that perpetuates achievement of this goal. The management of wealth and redistribution within nations is the significant issue that determines the extent of poverty within countries and the environmental conditions. Increasing globalisation and competitiveness with other countries means that the influences on governments have a wider geographic and political scope than the home nation. This makes policies on economic growth, poverty alleviation and environmental conditions more susceptible to international and business influences than ever before. Chapter Four illustrates the

point that government should involve business and industry in determining what factors are created and encourage firms to play a prominent role in factor creation themselves. Government should only play a direct role for externalities, which implies a need for greater partnership working between the public and private sectors.

The key feature of globalisation is that it increases competitiveness between a widening network of businesses. The world market is growing, both as a result of growth in population and economic growth, and as globalisation becomes more prevalent, more businesses from more countries are starting to compete with each other. This creates a pressure to find more innovative ways to compete and increases opportunities and number of ways in which businesses can and need to compete. As competition increases the competitive edge can be gained from activities which may have previously been perceived as anti-competitive. For example, as more demand is created for a particular product and consumers become more sophisticated, the competitive edge of a particular manufacturer is increasingly derived from offering a wider range of variations on the product, including specific features, and variations on related services. It is possible to harness the potential of the increasingly competitive environment that the business and industry sector is working in to deliver sustainable development. Governments with a key role in delivery of Agenda 21 and with the power to effect changes in business behaviour may have means and opportunity to harness this potential for the benefit of sustainable development.

Business responds well to the pressure to innovate for competitive advantage. Innovation, along with trade and productivity, are key features of competitiveness. Given that the problems of sustainable development are so complex and there is significant lack of understanding about how the competing pressures typical of sustainable development can be resolved, then innovation and advancement, not just technological but also process, policy and management styles and practices, are all key elements in ensuring an effective solution is brought to bear. Globalisation and increasing competition will mean that businesses will innovate in areas that are of core importance to their business and so some intervention or influence is required to make this effort a more sustainable global asset. Thus sustainable competitiveness is the area where this energy and commitment to innovation is harnessed for sustainable development. Chapter Three also makes the point that there is a need to use regulations and market mechanisms to lever private sector funding and potentially also a need to generate more wealth to support sustainable development. This is only being undertaken to a limited extent in Scotland with few market mechanisms aimed at sustainable development. Equally the UK growth rate of roughly 2% per year is lower than that suggested by the Brundtland report (3%) for sufficient growth to redistribute more resources to sustainable development practices.

8.4.3 Conditions for Engaging Business in Sustainable Competitiveness

Policy in Scotland needs to evolve to take advantage of the potential inherent in the concept of sustainable competitiveness. The right conditions for engaging business in sustainable competitiveness are:

- ***Better links to social justice agenda***

- ***More emphasis on encouraging innovation***
- ***Consumer awareness raising and consensus building***
- ***Increasing accountability in companies relating to sustainable development***
- ***Back up policy statements and voluntary agreements with legislation and market mechanisms***
- ***Sending a wider message about what sustainable development means for business***

One of the main conclusions of the Brundtland report was that society had a major role in environmental stresses, whether as a cause or victim of them. This emphasis on the connection has until very recently not been made in Scottish policy. The recent connection is made in Scotland's First Minister's speech of 22nd February 2002 referencing environmental justice. However no policy statement or activity to date in the Scottish public sector has succeeded in making this link a more practical and permanent one. In line with this there has been no public sector effort to build consensus with the public on this matter with the result that some people are not able to make the connections between their immediate social problems and their long-term potential which could rely on environmental quality. The opportunity for others to enact their values relating to the natural environment are not always readily available either.

Chapter Three noted that partnership was the only technique promoted by Agenda 21 for working with the business and industry sector. Policy implementation in Scotland has not to date taken a lead from this nor is government in Scotland

implementing consensus building through partnership working with the business and industry sector. Such partnership approaches can also be used to develop the right policy environment to encourage more innovation for sustainable development drawing on the experience of business and industry in identifying and meeting market needs. The conditions that create the dynamic advantages of innovation, education and training and pressures for upgrading are only partially apparent in the form of the emphasis placed by government on eco-efficiency.

The issue of accountability of business and industry has in part been addressed by the efforts of the UK government to encourage more of this activity. However this together with other initiatives are not being backed up by legislation and market mechanisms that can create the incentive for all but the leading companies proactive in this area. There is no evidence to support the suggestion that government is really encouraging action by business, rather it appears that big and proactive businesses are acting in areas of sustainability where they feel they are vulnerable from stakeholder pressure and business risk. The momentum that could be created from this activity by government appears not to have materialised.

Given the aspects of sustainable competitiveness described above, that are lacking from the Scottish policy framework and it's implementation, to take an approach of ecological modernisation, in its' current form, would be a necessary but not sufficient direction to encourage more sustainable competitiveness. Ecological modernisation would need to set out more clear approaches to social responsibility and accountability as well as accepting that regulations and market mechanisms can

be useful in enforcing and stimulating engagement in voluntary and consensual approaches to policy making.

8.5 Recommendations

The following recommendations are largely aimed at improvements to Scottish and UK policy and to the implementation of existing policy in both the UK and Scotland. The first section relates to policy and the second to implementation. The recommendations presented are derived from the thesis conclusions above and relate to conditions that will improve reconciliation of sustainable development and competitiveness in Scotland.

8.5.1 Policy Recommendations

1. The UK Government and the Scottish Executive should recognise the potential of sustainable competitiveness as a policy objective and thus recognise the full range of activities that make business more sustainable without a negative effect on competitiveness. They should further agree to develop a framework for sustainable competitiveness as a means to establishing a more feasible policy framework for implementing sustainable development.
2. The theories of competitiveness outlined in Chapter Two should be revisited with a forward looking and sustainable development perspective to create a theory of what will make firms and nations competitive in the future.
3. The nature of the companies and their approach to risk offer some understanding of the future potential of corporate governance in making companies more sustainable. The framework of corporate governance offers a significant opportunity to create a framework for sustainable competitiveness. Its full

potential should be explored in the context of improving the policy framework for sustainable competitiveness.

4. Government should put business leadership for sustainable development on the policy agenda. Aiming efforts to the business leaders and emphasising a government role in education and partnership to encourage more sustainable behaviour could encourage proactive business to lead the necessary change.

5. Government should establish finance programmes, such as venture capital programmes or enhanced capital allowance, aimed at stimulating innovation of sustainable product development.

6. The policy framework should be extended to make sustainable competitiveness features applicable to a wider range of business types than those currently affected (i.e. not all dependent on energy).

7. The UK Government and the Scottish Executive should develop and implement policies that address those features of sustainable development that are externalities to sustainable competitiveness. Specifically Government should take a leadership role in and establish specific policies that:

   - address consumption;
   - link sustainable development to the social justice and economic development policies; and
   - create an environment policy;

   recognising that these areas specifically require public sector intervention.

8. Implement instruments (voluntary agreements, market mechanisms and regulations) that mainstream eco-efficiency activities.

8.5.2 Policy Implementation Recommendations

1. Government should clarify its role in regard to sustainable development delivery and in particular the role where it drives sustainable development and the roles where it supports sustainable development. It is recommended that government takes a broad role in driving through leadership, consensus building and through sending early signals about legislation, regulations and market mechanisms encouraging voluntary agreements to motivate early mover advantage. The leadership role should encourage business to create sustainable factor conditions. Support mechanisms should only be used within the context of such leadership to support SMEs to act more competitively in regard to sustainable development.
2. Government should address the political feasibility of its ability to implement sustainable development by setting clear objectives, strategy, targets and propose legislation to add weight to all these activities. To increase resonance of sustainable development across Scotland:

- the work should be allocated to officers and organisations more widely across the public sector;
- sustainable development should be promoted with relevance and resonance for Scotland; and
- Government should promote more sustainable lifestyles and encourage industry to meet that demand through business sectoral strategies.

3. The government should take a more proactive and flexible role to sustainable competitiveness issues developing in particular more voluntary agreements to encourage innovation and business leadership. Government should engage in more focussed and output oriented voluntary agreements with business to

encourage particular types of more sustainable behaviour through the sectoral strategies. It should further set regulations or market mechanisms that will come into force regardless of the success of the voluntary agreements with exemptions and competitive advantage for those involved in the voluntary agreement approach. It should also live up to promises to enforce the objectives of the agreements for all companies at a point where the new approaches are understood and other companies have time to make changes to their business to meet the objectives of the new regulations or market mechanisms.

4. The Government should establish conditions for sustainable competitiveness. The Scottish Executive and its local delivery agencies should engage with large proactive businesses to support SMEs to act more sustainably. Education and partnership with proactive businesses should be encouraged to lead a cultural change for sustainable development, emphasising their role in business leadership. Improved links between Local Agenda 21 efforts and national priorities will enable local priorities to be implemented in context and give Local Agenda 21 effort credibility in awareness raising and consensus building at a local level. More information in the public sector is required to encourage the business and industry sector to undertake more engagement. Regulations to ensure increased accountability in business in regard to sustainable development should be established. Programmes to encourage innovation for sustainable development should be funded.

5. Eco-efficiency measures should be mainstreamed. Specifically a cost benefit analysis of public sector intervention into waste minimisation and efficiency should be undertaken to validate this activity.

BIBLIOGRAPHY

Abramowitz H (1979), Economic Growth and its Discontents *in Economic and Human Welfare* (Michael Boskin, Ed.), Academic Press: New York

AGSD (1999), Scotland the Sustainable? 10 Action Points for the Scottish Parliament, A Report to the Secretary of State for Scotland

Agyeman J and Evans B (1994), The New Environmental Agenda *in Local Environmental Policies and Strategies* Longman: Harlow

Anderson K and Blackhurst R (Eds) (1992), *The Greening of World Trade Issues*, Harvester Wheatsheaf: London

Ball D A and McCulloch, Jr W H (2000), 1999-*2000 Update to Accompany International Business: The Challenge of Global Competition*, 7th Edition, McGraw Hill: Boston

Banuri T (1994), Noah's Ark or Jesus' Cross? *UNCED as a Tale of Two Cities* in Review XVII, 2, Spring 1994, pp187 – 213

Barnard B (1996), *Does Business Want a Green Europe*? In Europe, April 1996, pp22-4

Birley T (2001*), Reality Check: A review of Scottish Executive activity on sustainable development*, WWF: Scotland

Bovenberg A L and Heijdra B J (1998) *Environmental Tax Policy and Intergenerational Distribution* in Journal of Public Economics, Vol. 67, No 1, pp1-24

Bradley S and Taylor J (1996) *Human Capital Formation and Local Economic Performance*, Regional Studies, Vol. 30, No 1, pp1–14

Bramble B (1997), Financial Resources for the Transition to Sustainable Development, in Dodds F *The Way Forward, Beyond Agenda 21*, Earthscan: London

Brown S (1990), Humans and their Environment: Changing Attitudes in Silvertown J and P Jarre, *Environment and Society*, Hodder and Stoughton: London

Budd L (1998) *Terratorial Competition and Globalisation: Scylla and Charybdis of European Cities*, Urban Studies, Vol. 35, No 4, pp663–685

Bunker S G (1996), *Raw Materials and the Global Economy. Oversights and Distortions in Industrial Ecology* in Society and Natural Resources, Vol. 9, No 4, pp419–429

Byrne M M (1997), *Is Growth a Dirty Word? Pollution Abatement and Endogenous Growth* in Journal of Development Economics, Vol. 54, No 2, pp261–284

Carraro C and Galeotti M (1997*), Economic Growth, International Competitiveness and Environmental Protection: R&D and Innovation Strategies with the WARM Model* in Energy Economics, Vol. 19, No 1, pp2–28

CEC (1993), *Growth, Competitiveness and Employment: The Challenges and Ways Forward into the 21st Century*, Commission of the European Communities: Brussels

CEC (2001a), *Sustaining the Commitments, Increasing the Pace*, COM(2001) 641 final, Commission of the European Communities: Brussels

CEC (2001b), *The Competitiveness Report*, Commission of the European Communities: Brussels
Chatterjee P and Finger M (1994*), The Earth Brokers, Power, Politics and World Development*, Routledge: London
Clayton A H, Talbot R D and Thomson I (1997), *A Development Strategy for Sustainable Enterprise at Selkirk Riverside: Final Overview Report*, University of Edinburgh, Edinburgh
Commoner B (1972), *The Closing Circle*, Bantam Press: New York
CoSLA (2000), *Local Agenda 21 Survey Report*, CoSLA: Edinburgh (Unpublished)
Crafts N and Toniolo G (Eds) (1996), *Economic Growth in Europe Since 1945*, Centre for Economic Policy Research, University of Cambridge: Cambridge, UK
Croners (2001), Interview with Michael Meacher, Croners Environment Magazine, Issue 3 Spring 2001
Daly H E (1980), *Economics, Ecology, Ethics*, Freeman: San Francisco
Daly H E (1995), *Consumption and Welfare: Two Views of Value Added* in Review of Social Economy, No 4, pp451–473
Daly H and Cobb J B, Jr (1989), *For The Common Good*, Beacon Press: Boston
Dean C and LeMaster J (1995), *Barriers to Technology Transfer: What Chief Executives Think*, in Business Forum Vol. 20 Winter/ Spring pp19-23
DeCrane, Jr A C (1995), *Green and Competitive* in Harvard Business Review, No. 6, Vol. 73, 1995, pp194
Desrochers P (2002), *Industrial Ecology and the rediscovery of inter-firm recycling linkages: historical evidence and policy implications*, Industrial and Corporate Change, Vol 11, No. 5 pp 1031-1057
Dincer I (1998), *Current and Future Perspectives on Energy Use and Environmental Impact*, International Journal of Environment and Pollution, Vol. 10, No 2, pp240-253
Dodds F (Ed) (1997), *The Way Forward: Beyond Agenda 21*, Earthscan: London
Dryzek J S (1987), *Rational Ecology*, Blackwell, Oxford
DTI (2001), *Productivity in the UK: Enterprise and the Productivity Challenge*, HM Treasury Department: London
EDSG (1999), *Final Report*, http://www.sustainable.scotland.gov.uk
Ekins P and Jacobs M (1995) Environmental Sustainability and the Growth of GDP: Conditions for Comparability, in Bhaskar V and Glyn A (eds.*) The North, The South and The Environment*, Earthscan: London
ENDS (1998), *Minister Backs Peers Over Attack on Sustainable Forestry Scheme*, in ENDS No 281, June 1998, pp33-34
ENDS (1999), *Strategy for Sustainability,* ENDS No. 292, pp170, May 1999
ENDS (2001a), *6th Environmental Action Programme Proposals*, in ENDS, No 313, Feb. 2001
ENDS (2001b), *Soft Talk or Big Sticks: How to get Industry to Act Voluntarily*, in ENDS No 316, May 2001

ENDS (2001c), *Commission Sets out Priorities for Sustainability Strategy*, in ENDS No 316, May 2001
Ehrenfeld J R (2000), *Industrial Ecology: Paradigm Shift or Normal Science,* American Behavioural Scientist, Vol. 44, No.2, pp 229-244
Everett R (1995), *Diffusion of Innovations*, 4th Edition, The Free Press: New York
Faucheux S and Nicolai I (1998), *Environmental Technological Change and Governance in Sustainable Development Policy* in Ecological Economics, Vol. 27, No3, pp243–256
Fleischman P (1969), *Conservation: The Biological Fallacy* in Landscape 18, pp 23-27
Freeman R (1984), *Strategic Management: A Stakeholder Approach*, Basic Books
Frijns J, Thuy Phuong P and Mol A P J (2000), *Ecological Modernisation Theory and Industrialising Economies: The Case of Viet Nam*, in Ecological Modernisation Around the World, Perspectives and Critical Debates, Eds Mol A P J and Sonnenfeld D A, Frank Cass, London
FT (2000), pp10, March 22nd Financial Times Publishing
Fudge C and Rowe J (2001), *Ecological Modernisation as a Framework for Sustainable Development: A Case Study in Sweden,* in Environment and Planning A, Vol. 33, pp 1527 - 46
Gardner G T and Stern P C (1996), *Environmental Problems and Human Behaviour*, Allyn and Bacon: Boston
Giampietro M and Mayumi K (1998), *Another View of Development, Ecological Degradation and North- South Trade* in Review of Social Economy, Vol. 56, No 1, pp20–36
Gibbs D (1997), *Urban Sustainability and Economic Development in the United Kingdom: Exploring the Contradictions* in CITIES, Vol. 14, No 4, pp203–208
Gille Z (2000), *Legacy of Waste or Wasted Legacy? The end of Industrial Ecology in Post Socialist Hungary*, in Ecological Modernisation Around the World, Perspectives and Critical Debates, Eds Mol A P J and Sonnenfeld D A, Frank Cass, London
Gouldson A and Murphy J (1996), *Ecological Modernisation and the European Union*, in Geoforum, Vol. 27, No.1 pp11-21
Grayson L and Hobson M (1994), *Inlogov Informs on Sustainability*, Inlogov Informs, Volume III, University of Birmingham Press: Birmingham
Grossman G (1974), *Economic Systems*, 2nd Edition, Prentice-Hall: New Jersey
Gunner M (1968), *Asian Drama: An Inquiry into the Poverty of Nations*, Pantheon: New York
Gute D M (1995), *Green and Competitive* in Harvard Business Review No.6, Vol. 73, pp198
Harrison P (1979), *Inside the Third World*, Penguin: London
Harrison P (1993), *The Third Revolution: Environment, Population and a Sustainable World*, Earthscan: London
Harrison R M (1990), *Pollution: Causes, Effects and Control*, Royal Society of Chemistry: Cambridge

Hays S P (1959), *Conservation and the Gospel of Efficiency*, Harvard University Press: Cambridge, Mass.
Hinrichsen D (1987), *Our Common Future: A Reader's Guide*, Earthscan Publications: London
Hirsh F (1976), *Social Limits to Growth*, Harvard University Press: Cambridge, Mass
Howard R (1990), *Can Small Business Help Countries Compete?,* in Harvard Business Review, Vol. 68, No. 6, 1990, pp88-103
HM Treasury (UK) (1998), *Stability and Investment for the Long Term: Economic and Fiscal Strategy Report 1998*, Cm 3978, The Stationary Office: London
Hurrell A and Kingsbury B (1992), *The International Politics of the Environment, Actors, Interests and Institutions*, Oxford University Press: Oxford
ICAEW (2000), *The Combined Code of the Committee on Corporate Governance*, Institute of the Chartered Accountants in England and Wales: London
Jacobs M (1997), *The Politics of the Real World, Meeting the New Century*, Earthscan: London
Jevons F (1992), *Who Wins from Innovation*? In Technological Analysis Strategic Management, Vol. 4, No 4, pp399-412
Jones P (Sir, CB) (1986), *Industry and the Need for Competitiveness*, Publication of McLintock Lecture at the North Wales Institute of Higher Education, 16 October, 1986
Jordan (1994)
Kandelaars P P A A H and VanDam S D (1998) *An Analysis of Variables Influencing the Material Composition of Automobiles* in Resources Conservation and Recycling, Vol. 34, No 3-4, pp322-333
Korhonen J (2002), *Two Paths to Industrial Ecology: Applying the Product-Based and Geographical Approaches*, Journal of Environmental Planning and Management, Vol 45, No.1 pp 39-57
Krutilla J V (Ed.) (1973), *Natural Environments: Theoretical and Applied Analyses*, John Hopkins University Press: Baltimore USA
Laffont J J and Tirole J (1996) *Pollution Permits and Environmental Innovation* in Journal of Public Economics, Vol. 62, No 1-2, pp127–140
Lasswell H D (1965), The World Revolution of Our Time: A Framework for Basic Research pp 29-96 in Lasswell H D and Lerner D (Eds*) World Revolutionary Elites*, MIT Press: Cambridge Mass.
Lee H and Roland Holst D (1997), *The Environment and Welfare Implications of Trade and Tax Policy* in Journal of Development Economics, Vol. 52, No 1, pp65-82
LeQuesne C and Clarke C A (1997), Trade and Sustainable Development in *The Way Forward: Beyond Agenda 21*, Dodds F (Ed.), Earthscan: London
Mannion A M (1991), *Global Environmental Change*, Longman: Essex
Markandya A and Richardson J (Eds.) (1992*), The Earthscan Reader in Environmental Economics*, Earthscan: London
Markusen J R (1997), *Costly Pollution Abatement, Competitiveness and Plant Location Decisions* in Resource and Energy Economics, Vol. 19, No 4, pp299-320

McConnell G (1965), The Conservation Movement: Past and Present in *Readings in Resource Management and Conservation*, Eds. Burton I, Kates R W, University of Chicago Press: Chicago
McConnell G (1971), *The Environmental Movement: Ambiguities and Meanings* in Natural Resources Journal II, pp 427-436
McCormick J (1989), *The Global Environmental Movement*, *Reclaiming Paradise,* Belhaven Press: London
McHarg (1977)
Meadows D et al. (1972), *The Limits To Growth*, Universe Books: New York
Mol A P J (1999), *Ecological Modernisation and the Environmental Transition of Europe: Between National Variations and Common Denominators*, Journal of Environmental Policy and Planning, Vol. 1, No. 2 pp 167-181
Mol A P J and Spaargaren G (2000), *Ecological Modernisation Theory in Debate: A Review,* in Ecological Modernisation Around the World, Perspectives and Critical Debates, Eds Mol A P J and Sonnenfeld D A, Frank Cass, London
Murphy J (2000), OCEES Research Paper 19, *From Production to Consumption: Environmental Policy in the EU,* Oxford Centre for the Environment, Ethics and Society: Oxford
Murphy J (2001), OCEES Research Paper No 20, *Ecological Modernisation: The Environment and the Transformation of Society*, Oxford Centre for the Environment, Ethics and Society: Oxford
Myers (1989), The Environment Basis of Sustainable Development in *Environmental Management and Economic Development*, Eds. Scramm G and Warford J J, World Bank: Washington
Naess A (1973), *The Shallow and the Deep, Long Range Ecology Movement. A Summary* in Inquiry 16, pp 95-100
Najam A (1996), *A Developing Countries Perspective on Population, Environment and Development* in Population Research and Policy Review, Vol. 15, No 1, pp1-19
NEDC (1990*), Environmental Issues and Policy Implications: Towards the White Paper*, Memorandum by the Trade Union Council, 20 March 1990, NEDC: London
NEDC (1991*), Environmental Protection and UK Competitiveness: The Challenge for Business*, Memorandum by the Confederation of British Industry, 20 May 1991, NEDC
Nelson R R (1991), *Recent Writings on Competitiveness: Boxing the Compass*, University of California: Berkeley, CA
Netherlands Ministry of Housing (1996), *Recommendation of the Council on Improving the Environmental Performance of Government May 1996*, Study Commissioned by the Netherlands Ministry of Housing, Spatial Planning and the Environment: the Hague
North R D (1995), *Life on a Modern Planet; A Manifesto for Progress*, Manchester University Press: Manchester
OECD (1992), *Progress in Structural Reform: An Overview,* OECD: Paris
OECD (1996a), *Industrial Competitiveness*, OECD: Paris

OECD (1996b), *Communiqué Issued Following the May 21 – 21 1996 meeting of the OECD Council at Ministerial Level,* OECD: Paris
OECD (1997), *Economic Globalisation and the Environment*, OECD: Paris
OECD (1998a), *Eco-efficiency*, OECD: Paris
OECD (1998b), *Towards Sustainable Consumption Patterns: a Progress Report on Member Country Initiatives*, OECD: Paris
OECD (1998c), *Voluntary Agreements,* OECD: Paris
OECD (2001), *The Well Being of Nations: The Role of Human and Social Capital (Education and Skills),* OECD: Paris
O'Neill J (1993), *Ecology, Policy and Politics: Human Well-Being and the Natural World*, Routledge: London
Ophuls W (1977), *Ecology and the Politics of Scarcity*, W H Freeman: San Francisco
O'Riordan T (1976), *Environmentalism*, Pion: London
Owen G (1997), *Who Controls Energy Efficiency Policy?* In Energy Policy, Vol 25, No 11 pp 959-967
Palmer K, Oates W E and Portney P R (1995), *Tightening Environmental Standards: The Benefit-Cost or the No-Cost Paradigm?* In Journal of Economic Perspectives, Vol. 9., No. 4, Fall 1995, pp 119 – 132
Pearce D W and Turner K (1990), *Economics of Natural Resources and the Environment*, Harvester Wheatsheaf: London
Pearce D, Barbier E and Markandya A (1990*), Sustainable Development: Economics and Environment in the Third World,* Earthscan: London
Peck F W (1996), *Regional Development and the Production of Space: The Role of Infrastructure in the Attraction of New Inward Investment* in Environment and Planning A, Vol. 28, No 2, pp327–339
Pellow D N, Schnaiberg A and Weinberg A S (2000), *Putting the Ecological Modernisation Thesis to the Test: The Promises and Performances of Urban* Recycling, in Ecological Modernisation Around the World, Perspectives and Critical Debates, Eds Mol A P J and Sonnenfeld D A, Frank Cass, London
Pepper D (1993), *Eco-Socialism: From Deep Ecology to Social Justice*, Routledge: London
PIRC (1996), *Shell and Nigeria: Analysis of the Company's Response to PIRC's Recommendations*, Report to Clients, December 1996 @ http://www.pirc.co.uk/shelldec2.htm
Pitchon P (1995), *The Unemployed: A North- South Dilemma,* in Share International, October, 1995
Popoff F P (1995), *Green and Competitive*, in Harvard Business Review, No. 6, Vol. 73, 1995, pp194
Porter M and van der Linde C (1995a), *Green and Competitive Reply* in Harvard Business Review No 6, Vol. 73, pp120 – 137

Porter M and van der Linde C (1995a), *Towards a New Conception of the Environment-Competitiveness Relationship* in Journal of Economic Perspectives, Vol. 9. No. 4, Fall 1995, pp 97 – 118
Porter M and Van Der Linde C (1995c), *Green and Competitive: Ending the Stalemate* in Harvard Business Review, Vol. 73, No 5, pp 120- 134
Porter M (1990), *The Competitive Advantage of Nations*, (1998 edition) Macmillan Press: Hampshire/ London
Porter R (1990), *The Enlightenment (Studies in European History)*, The Wellcome Institute for the History of Medicine: London
Portney P R (1995), *Green and Competitive* in Harvard Business Review No.6, Vol.
Pratten C (1991), *The Competitiveness of Small Firms*, Cambridge University Press: Cambridge
Quarrie J (1992), *Earth Summit 1992: The United Nations Conference on Environment and Development*, Regency Press: London
Ramade F (1984), *Ecology of Natural Resources*, John Wiley and Sons: Chichester, UK
Redclift M (1987), *Sustainable Development: Exploring the Contradictions*, Methuen: London
Redclift M and Benton T (Eds) (1994), *Social Theory and the Global Environment*, Routledge: London
Reich R (1990), *Who is US?* in Harvard Business Review, Vol. 68, No 1, pp53-64
Reich R (1991), *The Work of Nations, Preparing Ourselves for 21st Century Capitalism*, Simon and Schuster: New York
Ricker M (1997), *Limits to Growth as Shown By a Computable Equilibrium Model* in Ecological Economics, Vol. 21, No 2, pp141–158
Rinkevicius L (2000), *Ecological Modernisation as Cultural Politics: Transformation of Civic Environmental Activism in Lithuania*, in Ecological Modernisation Around the World, Perspectives and Critical Debates, Eds Mol A P J and Sonnenfeld D A, Frank Cass, London
Roberts P (2003), *Economic restructuring, regional development and the environment: ecological modernisation and the European Union's Structural Funds*, in International Journal Environment and Sustainable Development, Vol. 2, No. 3 pp 1 -18
Roberts R (1998), *Managing Innovation: The Pursuit of Competitive Advantage and the Design of Innovation Intense Environments* in Research Policy, Vol. 27, No 2, pp159–175
Rosentraub M S and Przybylski M (1996), *Competitive Advantage, Economic Development and the Effective Use of Local Public Dollars* in Economic Development Quarterly, Vol. 10, No 4, pp 315–330
Rothwell R and Zegfeld W (1988), *An Assessment of Government Innovation Policies*, in Roessner J D (Ed) Government Innovation Policy, Macmillan: Basingstoke
Sachwald F (Ed) (1994), *European Integration and Competitiveness: Acquisitions and Alliances in Industry*, Edward Elgar: Hants, England

Sandbrook R (1992), *From Stockholm to Rio,* in Earth Summit '92, The United Nations Conference on Environment and Development, UNED: New York
Schmidheiny S (1995), *Green and Competitive* in Harvard Business Review No.6, Vol. 73, 1995, pp 196
Schmidheiny S (with BCSD) (1992), *Changing Course: A Global Business Perspective on Development and the Environment*, MIT Press: Cambridge, Massachusetts
Schumpeter J (1939), *Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process*, McGraw Hill: New York
Scottish Business in the Community (1999), *Social Inclusion: The Business Agenda*, Scottish Business in the Community: Edinburgh
Scott-Kemmis (1988)
Scottish Executive (1999), *Down to Earth,* Scottish Executive: Edinburgh
Scottish Executive (2000a), *Sustainable Scotland: Making it Work Together*, Unpublished
Scottish Executive (2000b), *The Way Forward: Framework for Economic Development in Scotland,* Scottish Executive: Edinburgh
Scottish Executive (2001), *A Smart, Successful Scotland: Ambitions for the Enterprise Networks*, Scottish Executive: Edinburgh
Scottish Executive (2002), *Meeting the Needs,* Scottish Executive: Edinburgh
Scottish Power (2000), *Environment Report 1999 – 2000*, Scottish Power: Glasgow
Silvertown J W and Jarre P (Eds.) (1990), *Environment and Society*, Hodder and Stoughton: London
Shell (2001a), *How do We Stand: People, Planet and Profits: The Shell Report 2000*, Shell
Shell (2001b), *Shell in the UK: Report to Society*, Shell
Simmons I G (1993*), Environmental History: A Concise Introduction*, Blackwell: Oxford
Simon J and Kahn H (1984), *The Resourceful Earth*, Blackwell: Oxford
Simon J L (1981), *The Ultimate Resource*, Princeton University Press: Princeton NJ
Sitarz D (Ed) (1994), *Agenda 21, The Earth Summit Strategy to Save Our Planet*, Earthpress: Colorado
Smith D (1992), *Business and the Environment: Implications of the New Environmentalism*, Chapman: London
Smith V K (Ed.) (1979), *Scarcity and Growth Reconsidered*, John Hopkins University Press: Baltimore
South Commission, The (1990)
Sonnenfeld D A (2000), *Contradictions of Ecological Modernisation: Pulp and Paper Manufacturing in South East Asia,* in Ecological Modernisation Around the World, Perspectives and Critical Debates, Eds Mol A P J and Sonnenfeld D A, Frank Cass, London
Spaargaren G and van Vliet B (2000), *Lifestyles, Consumption and the Environment: The Ecological Modernisation of Domestic Consumption* in Ecological Modernisation

Around the World, Perspectives and Critical Debates, Eds Mol A P J and Sonnenfeld D A, Frank Cass, London
Steger U (1995), *Green and Competitive* in Harvard Business Review No.6, Vol. 73, 1995
Stern D I, Common M S and Barbier E B (1996), *Economic Growth and Environmental Degradation: The Environmental Kuznet's Curve and Sustainable Development* in World Development, Vol. 24, No 7, pp 1151-1160
Stigson B (1997), The Business Charter for Sustainable Development, *in The Way Forward; Beyond Agenda 21* (Ed Dodds F), Earthscan: London
Stoneman P and Battisi G (1998), *Fiscal Incentives to Consumer Innovation: The Use of Unleaded Petrol in Europe* in Research Policy, Vol. 27, No 2, pp 187–213
Storey D J (1994), *Understanding the Small Business Sector*, International Thomson Business Press: London
Strange S (1998), *Who are EU? Ambiguities in the Concept of Competitiveness* in Journal of Common Market Studies, Vol. 36, No 1, pp 101–114
Sustainability (2001), *Buried Treasure: Uncovering the Case for Corporate Sustainability,* Sustainability: London
Tansley A G (1935), *The Use and Abuse of Vegetational Concepts and Terms* in Ecology 16, pp 284-307
The South Commission (1990), *The Challenge to the South*, Oxford University Press: Oxford
Tietenberg T (1992), *Environmental and Natural Resource Economics*, 3rd Edition, Harper Collins: New York
Timberlake L (1992), *Changing Business Attitudes* in Earth Summit '92, The United Nations Conference on Environment and Development, UNED: New York
Todaro M P (1982), *Economics for a Developing World*, 2nd Edition, Longman: Burnt Mill, UK
Tolba M K and El-Kholy O A (1992), *The World Environment 1972 -1992 Two Decades of Challenge*, Chapman and Hall: London
Treece D (1992), *Why the Earth Summit Failed* in International Socialism, Autumn, Part 56, pp 63-81
UK Government (2000), *Productivity in the UK: The Evidence and the Government's Approach*, HMSO: London
UN (1997), *Critical Trends: Global Change and Sustainable Development,* Department for Policy Co-ordination and Sustainable Development, UN: New York
UNCTC (1985), *Environmental Aspects of the Activities of Transnational Corporations: A Survey*, United Nations: New York
UNCTC (1992), *Climate Change and Transnational Corporations Analysis and Trends*, United Nations: New York
UNDP (1991), *Human Development Report*, Oxford University Press: Oxford
UNED (1992*), Earth Summit '92: The United Nations Conference on Environment and Development,* United Nations: New York

UNPRED (1984), *United Nations Population, Resources, Environment and Development: Proceedings of the Expert Group on Population, Resources, Environment and Development, Geneva, 25 - 29 April, 1983 for the International Conference on Population 1984,* United Nations: New York
US (1996), *Population and Sustainable Development* in Population and Development Review, Vol. 22, No 2, pp391-398
Von Weisacker E, Lovins A B and Lovins L H (1997), *Factor Four: Doubling Wealth, Halving Resources*, Earthscan: London
Wackernagel M and Rees W E (1996), *Our Ecological Footprint: Reducing Human Impact on the Earth*, New Society Publishers: Philadelphia, PA
Wallace D (1995), *Environmental Policy and Industrial Innovation: Strategies in Europe, the US and Japan,* The Royal Institute of International Affairs, Earthscan: London
Wallace D (1999), *Sustainable Industrialisation*, Earthscan: London
Washington State University (2002), *World Civilisations: An Internet and Classroom Anthology* @ http://www.wsu.edu/~dee/WORLD.HTM
WEF (World Economic Forum) (1999), *The Global Competitiveness Report*, Oxford University Press: Oxford/ New York
Whittaker S (1995), *Local Agenda 21 and Local Authorities*, in Local Government Policy Making, Vol. 22 No 2 October, 1995 pp 3 - 11.
WHO (1991), *Environmental Health in Urban Development*, Report of a WHO Expert Committee, WHO Technical Report Series 807, WHO: Geneva
Wilson D S (1980), *The Natural Selection of Populations and Communities*, Benjamin Cummings: Menlo Park
Woodwell J C (1998), *A Simulation Model to Illustrate Feedbacks Among Resource Consumption, Production and Factors of Production in Ecological – Economic Systems* in Ecological Modelling, Vol. 112, No 2-3, pp 227–247
Woolard E S (1995), *Green and Competitive*, Harvard Business Review, No. 6, Vol. 73, 1995
World Bank (2000), *World Bank Development Report*, World Bank: Washington
WCED (1987), *Our Common Future*, Oxford University: Oxford
Worldwatch Institute (2001), *The State of the World: Report on Progress Towards Sustainability 2001*, Earthscan: London

WEB REFERENCES

BP: http://www.bp.com
BSD Global: http://www.bsdglobal.com/
BT Group: http://www.groupbt.com
Forward Scotland: www.forward-scotland.org.uk
FT News: http://news.ft.com
http://business-in-environment.org.uk

http://www.bsr.org
http://www.forumforthefuture.org.uk
http://www.queensawards.org.uk
http://www.sbcscot.com
Highlands and Islands Enterprise: http://www.hie.co.uk
International Institute for Sustainable Development: http://www.iisd.org
Railtrack: http://www.railtrack.co.uk
Scottish Enterprise: http://www.scottish-enterprise.com
Smith Anderson: http://www.smith.anderson.com/index.html
The Environmental Reporting Clearing House: HTTP://CEI.SUND.AC.UK/CORE.HTM
The Scottish Parliament, Summary of the Findings of the Advisory Group on Sustainable Development (AGSD): http://www.scottish.parliament.uk/whats_happening/research/pdf_res_notes/rn01-29.pdf
The Social and Ethical Reporting Clearing House: HTTP://CEI.SUND.AC.UK/ETHSOCIAL/INDEX.HTM
The UK Government Sustainable Development Website: http://www.sustainable-development.gov.uk
The United Nations Human Development Report, 2001: http://www.undp.org

APPENDIX ONE: DETAILS OF PUBLIC SECTOR INTERVIEWS

Organisation	Organisation Type	Project	Interviewee Name	Interviewee Role	Date of Interview
Renfrewshire Council	Local Authority	Waste Minimisation grants to SMEs	Collette Saez	Project Manager	3 09 1999
Renfrewshire Enterprise (now Scottish Enterprise Renfrewshire)	Local Enterprise Company	Organisational Strategy	Bob Lawrie	Manager	9 11 1999
Renfrewshire Enterprise (now Scottish Enterprise Renfrewshire)	Local Enterprise Company	Drumcross Farm	Bill Devlin	Project Manager	06 09 1999
South Ayrshire Council	Local Authority	Girvan Waste Minimisation Project	Ken Gibb	Local Agenda 21 Officer	5 10 1999
Girvan Sustainable Communities Project	Project Funded Community Based Organisation	Girvan Sustainable Communities Project	Liz Berry	Project Manager	5 10 1999
ACS Environmental	Environmental Consultant	Sustainable Development Strategy	Roger Willey	Company Director	Sept 1999
ACS Environmental	Environmental Consultant	Girvan Waste Minimisation Project	Derek McGregor	Consultant	Sept 1999
Lanarkshire Enterprise (now Scottish Enterprise Lanarkshire)	Local Enterprise Company	Organisational Strategy	David Stevenson	Senior Manager	Oct 1999
Scottish Borders Enterprise Company (now Scottish Enterprise Borders)	Local Enterprise Company	Tweed Horizons and Selkirk Riverside	Rachael Meehan	Environment and Business Project Manager	16 10 2000

Organisation	Organisation Type	Project	Interviewee Name	Interviewee Role	Date of Interview
Scottish Borders Enterprise Company (now Scottish Enterprise Borders)	Local Enterprise Company	Tweed Horizons and Selkirk Riverside	Simon Longlands	Tweed Horizons Project Manager	16 10 2000
Forward Scotland	Not for Profit Company	Organisational Strategy and various projects	Andrew Lyon	Development Manager	Oct 1999
Scottish Enterprise	National Enterprise Company	Organisational Strategy and various projects	Liz Bogie	Sustainable Development Manager	27 02 2001
The Scottish Executive	Central Government	Organisational Strategy and Various projects	Geoff Pearson	Sustainable Development Unit Manager	23 08 2000

APPENDIX 2: SOURCES OF INFORMATION ON GOOD PRACTICE IN THE PRIVATE SECTOR IN SCOTLAND

A number of sources of information on good practices were investigated and as indicated below many reported good practices from the same companies. Sources researched are listed below and all sources were researched during December 2000:

FT.com World's Most Respected Companies Survey Published 19 December 2000. This includes a section on the 50 most socially responsible companies and those that operate in the UK are: Royal Dutch Shell; BP; Body Shop; and Virgin

Business for Social Responsibility: This is known as a centre of excellence in corporate sustainable practice. The website lists a number of examples of world leadership by specific companies across a range of sustainable development activities. The companies that operate in Britain are not necessarily UK based. The companies which demonstrate leadership in more than one aspect of sustainable development are as follows: BP; Diaggeo; Compaq; The Body Shop; Cisco Systems; Ford Motor Company; IBM; Ikea; BT; Royal Dutch Shell; The Co-Operative Bank.

Business in the Environment: This is an organisation operating in the UK which is a practical networking tool for business, helping companies to make the connection between good environmental practice and sound business performance. Companies noted here of interest are the top ten companies ranked according to environmental policy in six key areas in a Financial Times article

(FT, 2000): Severn Trent, BT, Cable and Wireless, Woolwich, Thames Water, BP Amoco, Astra Zeneca, Anglian Water, Vauxhall Motors, Scottish Power.

The UK Department of Environment, Transport and the Regions Sustainable Development website: This website launched in January 2001 has a section on business and notes specific companies which exercise good practice. These are AEA technology; B&Q; BIFFA; The Body Shop; Bristol Myers-Squibb; BAA; The Co-operative Bank; Northumbrian Water Group; Sainsbury. In addition the website notes companies which offer good reports on their practice relating to sustainable development. These companies are BP; BT; Railtrack; and Shell.

The Queen's Awards: Aimed at improving sound business practice this award has three categories, one of which is good practice in sustainable development. The award category on sustainable development is new for 2000 and replaces the environmental achievement category. 9 of the 77 award winners for the sustainable development category in 2000 are based in Scotland. These are: Baillie Gifford Overseas Ltd, Edinburgh - Investment Management; Anderguage Limited, Aberdeen - Specialist Drilling Tools; Bridge of Weir Leather Company, Bridge of Weir, Renfrewshire - Leather; The Macallan Distillers Ltd., Craigellachie, Banffshire - Highland Malt Whisky; Mannesmann Rexroth Ltd, Rexroth Scotland, Glenrothes, Fife - Hydraulic Motors; John Ross Jr (Aberdeen), Torry, Aberdeen - smoked salmon and fresh fish; Sernefab (Scotland) ltd, Glenrothes, Fife - Integrated circuits and other semiconductor related products;

Silberline Ltd, Leven, Fife - Aluminium Pigments in Paste and Granule; Traditional Weatherwear Ltd, Cumbernauld - Macintoshes and quality outerwear.

Forum for the Future: This is an organisation based in England that works on sustainable development through a range of programmes. It runs a business programme working with Forum for the Future Foundation Corporate Partners to improve their understanding of and practice in sustainable development. Of the companies they work with only a few have operations in Scotland. These are BT, The Post Office, Railtrack, Tesco Stores, and the Royal Bank of Scotland.

Scottish Business in the Community: The companies it profiles, which are based in Scotland, are: Simmers of Edinburgh; United Biscuits; Travel Dundee; Rolls Royce; Scottish Power Learning; Lloyds TSB Foundation; Standard Life Assurance Company; Whitbread; B&Q; The Big Issue; BAA; The Body Shop. (Scottish Business in the Community, 1999)[1]

---

[1] For more information on each of the above see the following websites: http://news.ft.com; http://www.bsr.org; http://www.business-in-environment.org.uk; http://www.sustainable-development.gov.uk; http://www.queensawards.org.uk; http://www.forumforthefuture.org.uk; http://www.sbcscot.com.

APPENDIX THREE: DETAILS OF PRIVATE SECTOR INTERVIEWS AND CORPORATE PROFILES

Company	Web Address	Sector	Interviewee Name	Interviewee Role	Date of Interview
Belhaven Brewery	N/A	Beverage Production and Distribution	David Walker and George Howell	Senior Manager and Chief Executive	25 05 2001
Smith Anderson	www.smith.anderson.com	Pulp Paper Producer	Jack Lord Smith and Brian Henry	Senior Manager and Chief Executive	25 05 2001
BT	www.groupbt.com	Telecommunications	Dunstan Hope	Environment Group Officer	1 05 2001
BP Amoco	www.bp.com	Oil and Gas Production	Dave Cutteridge	Environment Manager	Feb 2001
Shell Expro UK	www.shell.com	Oil and Gas Production	Dermot Grimson	Public Affairs Manager	Dec 2000
ScottishPower	www.scottishpower.com	Electricity Generation and Distribution	Fred Dinning	Manager	21 03 2001
UDV	www.diaggeo.com	Alcoholic Beverage Distillation	Jim Beveridge	Production Manager	23 11 2000
Railtrack	www.railtrack.co.uk	Rail Network	Kirsty Young	Environment Manager	June 2001

CORPORATE PROFILES

1. **Belhaven Brewery** (BB): Belhaven Brewery is a comparatively small independent brewery producing nearly 70,000 barrels of beer per year. A workforce of around 70 people brew a range of cask conditioned and keg beer at Dunbar, East Lothian. The site also has a large bottling plant where a significant volume of other manufactures' beers are bottled. Turnover is approximately £15M per year.

2. **BP Amoco** (BP): The company's main activities are exploration and production of crude oil and natural gas, refining, marketing, supply, and transportation and marketing and manufacturing of petrochemicals. The company also has a growing activity in gas and power and in solar power generation. This company was founded in 1998 following a merger between BP established in 1909 and Amoco established in 1889. The company has also absorbed Arco established in 1866. BP employs 107,000 people worldwide, with exploration activities in 29 countries and production activities in 23 countries. Turnover is approximately $148 billion per year.
3. **BT Group (BT)**: BT's principle activities include local, long distance and international telecommunications services, mobile communications, internet services and IT solutions. In the UK BT services 29 million exchange lines and more than 11 million mobile customers as well as providing network services to other licensed operators. BT has operations worldwide, employing over 137,000 people, although in the future it intends to focus more on the UK and Western Europe. In the year to March 31, 2001 BT Group's turnover was over £20.4 million.
4. **Railtrack**: Railtrack's core business is maintaining and reviewing Britain's railways. It is the company that owns and operates Britain's railway infrastructure: tracks, signals, tunnels, bridges, viaducts, level crossings and stations. The company employs around 11,000 people and it's turnover for the financial year 2000–01 was over £2.4 million.
5. **ScottishPower**: ScottishPower is a major international energy group which had a turnover of £6.3 billion in 2000–01. ScottishPower and its subsidiaries serve around 7 million homes and businesses in the Northwest US and across the UK providing electricity

generation, transmission, distribution and supply services in both countries. The company's US activities extend to coal mining. In Great Britain ScottishPower also supplies gas, water and wastewater treatment, telephony and Internet services and retails electrical, gas and home entertainment appliances. The company employs around 24,000 people.

6. **Shell**: This company produces, processes and delivers energy. It is engaged in exploration and production, oil products, chemicals, downstream gas and power and renewable energy development and production. It operates across the globe in more than 130 countries employing more than 100,000 staff. Shell's operating profits in 1999 were US$15.2 billion.
7. **Smith Anderson**: Smith Anderson produces paper, envelopes and bags over around 3 sites throughout the UK. The main operation is based in Fife. The company employs around 867 staff and has an annual turnover in excess of £60 million.
8. **United Distillers and Vintners (UDV)**: UDV is part of the Diageo Group. Diageo is one of the world's leading consumer goods companies. Formed in 1997 through the merger of GrandMet and Guinness, Diageo employs around 72,000 staff. Diageo has an annual turnover of nearly £12 million. United Distillers & Vintners (UDV) is the spirits and wines division of Diageo and owns a portfolio which includes 18 of the world's top 100 brands and operates in over 200 markets world-wide. The headquarters of UDV's UK production is based in Edinburgh. In Scotland, UDV operates four maltings, 27 malt distilleries and two grain whiskey distilleries, producing over a third of the industry's total output of spirit. UDV also has large warehousing operations in central Scotland as well as

sophisticated blending facilities and a range of technical support services from cooperages and coppersmiths to research centres and new product development groups.

APPENDIX FOUR: CABINET SUB COMMITTEE ON SUSTAINABLE SCOTLAND (CSCSS)

The remit is to:

- Identify priorities for action on sustainable development in Scotland
- Co-ordinate implementation action
- Support cabinet colleagues in embedding sustainable development in their policies and programmes

Chaired by Scotland's First Minister, the members of the CSCSS are:

- Minister for Environment and Rural Development
- Minister for Finance and Public Services
- Deputy Minister for Enterprise, Transport and Lifelong Learning
- Deputy Minister for Environment and Rural Development
- Deputy Minister for Social Justice
- Kevin Dunion (Director, Friends of the Earth Scotland)
- Mark Hope (Director, External Affairs, Shell Expro)
- Jan Bebbington (Professor of Accountancy, University of Aberdeen)

APPENDIX FIVE: AGSD RECOMMENDATIONS

1. The Parliament and the Scottish Executive should demonstrate committed leadership
2. Set up a Sustainable Development Commission
3. Establish a public debate on sustainable development
4. Put sustainable development at the heart of education, and education at the heart of sustainable development
5. Be part of the international dimension of sustainable development
6. Set sustainability aims, objectives, targets and timescales
7. Take a proactive approach to the sustainability of construction and the built environment
8. Establish priority areas for action
9. Strengthen the role of the planning system in delivering national and local sustainable development
10. Support innovation in sustainable development

APPENDIX SIX: ESDG RECOMMENDATIONS

1. The Parliament and the Scottish Executive should establish a leadership programme on sustainable development.
2. The structures set up by the Parliament and Executive to promote sustainable development should integrate education.
3. The Department of the Executive dealing with education should be given explicit responsibilities for promoting education for sustainable development within education and more widely.
4. The Executive should establish a voluntary partnership of major public education bodies to promote complementary action on education for sustainable development within the education sector.
5. The Parliament and the Executive should promote a wide ranging debate on the role and purposes of education for the future, as part of a wider debate on sustainable development.
6. The Parliament and Executive should build effective working links within the UK and internationally to learn, and share experience, about education for sustainable development.
7. The Executive should use its powers and opportunities of policy direction, formal guidance and setting conditions of public funding to promote education for sustainable development.
8. The Executive should ensure improved access to information and examples of good practice on education for sustainable development.

9. The Executive should initiate a programme of projects and initiatives to build a body of documented good practice on education for sustainable development.
10. The executive should ensure that education is included in the development of Local Agenda 21.

APPENDIX SEVEN: PUBLIC SECTOR INTERVIEW QUESTIONS

1. What is the overarching goal in the activities your organisation undertakes?
2. How do you interpret competitiveness in this area and what indicators, if any, do you use to measure it?
3. What do you understand by the term sustainable development?
4. What role do you see for your organisation in the implementation of sustainable development?
5. Do you see a role for your organisation in encouraging businesses to reduce waste, encourage businesses to be more energy efficient, or encouraging business to be more efficient in their use of resources?
6. Are there any ways you think your organisation could be enabled to encourage the activities described in question 5 above?
7. Do you see a role for your organisation in encouraging businesses to change their methods of production, to develop less resources intensive products or to change their product to one more recyclable, repairable, or one which is easier to replace parts rather than whole?
8. Are there any ways you think your organisation could be enabled to encourage the activities described in question 7 above?
9. What role does your organisation have in developing necessary infrastructure (such as physical infrastructure, waste management, energy supplies or R&D)?
10. What role does your organisation play in stimulating innovation locally?

APPENDIX EIGHT: PRIVATE SECTOR INTERVIEW QUESTIONS

1. Give a brief description of what the organisation does, how large it is (both on site and with other units), other key features?
2. What are the key factors or processes in your operation which enable you to deliver your product or service?
3. What features of the way you do business give you a competitive edge?
4. Could you describe the organisational culture?
5. What do you understand by the term sustainable development?
6. How does your organisation contribute to sustainable development?
7. How do you feel that your contributions to sustainable development affect your competitiveness?
8. Are there other actions you would take to contribute to progress towards sustainable development if they did not affect, or contributed to, your organisation's competitiveness?
9. What support do you need, if any, from the public sector in terms of implementing sustainable development?
10. To what extent are you able or prepared to change the way in which you operate to meet goals of sustainable development?

APPENDIX NINE GLOBAL EXAMPLES OF GOOD PRACTICE

Example A: Ozone-Depleting Substances (ODS) Phase Out Strategy: Egypt

Egypt is home to nine manufacturers of domestic refrigerators and freezers that service both the domestic market and some parts of the Middle East. In 1997 the industry was unregulated and emissions of ODS's were increasing dramatically. However to address this problem the Egyptian government adopted an ambitious phase out target with the objective of stopping production of CFC12 by 1998 and CFC11 by 1999. The largest manufacturer in the country, Electrostar, welcomes the new regulations viewing them as an opportunity to overhaul its production facilities and carve out new markets for itself throughout the Middle East and abroad. The regulations anticipate international standards and offer a phase-in period particularly for CFC11. Business participation in the development is apparent from the reaction of Electrostar to the new regulations and the market incentives for business expansion encourage innovation to meet the new regulations. The role of Electrostar in welcoming the new standards can be used to educate and alert consumers and competitors to the need and development of the new regulatory standards. This particular regulation focuses on source reduction of a particular chemical and through the features described above enable innovation and encourages competitiveness.

Source: IISD

Example B: Transatlantic Norms Agreed on for Mobile Machinery Emissions

The EU plans to phase in exhaust emissions standards for a wide range of diesel powered mobile machinery in three stages over a period of seven years. For the first time the standards are being harmonised with the US. This creates a transatlantic market for manufacturers. These standards are the first to fill the gap for a range of machinery types filling a gap in the EU's body of air quality pollution. These regulations affect product standards and create a new level playing field for production of all the machinery types specified by the regulations. The phase-in period and the third stage of more stringent standards makes the regulations very clear about the objective. The regulations also anticipate international standards due to the wide coverage, a result of the agreement throughout Europe and in the US.

Source: IISD

Example C: Energy Efficiency Standards for Refrigerators

In 1997 the US government announced new efficiency standards to require refrigerators manufactured after July 2001 to use 30% less energy than required at the time of the announcement. The US Department of Energy has estimated that the cost of the more efficient appliances will increase by about US$80 although it expects the typical consumer to be able to recover that amount in energy savings within four years. Government has engaged business in the development of the new standard but taken a tough stance on the deadline, which most appliance manufacturers wanted to see extended. The legislation encourages source reduction of HCFCs before the ban deadline set by another piece of legislation. This feature also makes the regulations predictable. The predicted consumer behaviour acts as a

market incentive to business and industry. There is also a phase-in of the regulations enabling business and industry to plan innovation to meet the new regulations. The regulations set product standards and encourage source reduction of a substance that will later be banned.

Source: IISD

Example D: Cutting Packaging Waste, Canada

In 1988, the Canadian Council of Ministers of the Environment, as well as consumer groups, environmental groups and industry came together to form the National Packaging Task Force. The task force developed a National Packaging Protocol that challenges industry to promote sustainable development by taking responsibility for their products and packaging from start to finish. The goal was to design, manufacture, fill, use and dispose of packaging in such a way as to minimise its effect on the environment. The aim of the regulations established is to reduce food-packaging wastes to 50% of 1988 volume by 2000. Interim targets were also set for four-year intervals. The regulations and their development here demonstrate both business participation in setting the standards and the establishment of a demand for environmental improvement by involving other groups in the development of the regulations. A phase-in period facilitates implementation and clear goals make the regulations predictable. The regulations are designed to achieve new product standards, a source reduction of particular materials in packaging and resource productivity during manufacturing.

Source: IISD

Example E: Charge Systems: Germany and Hungary

The German Government operates the Waste Water Charges Act aimed at reducing the amount of waste and other pollutants that are introduced into Germany' aquatic environment. The charge is determined by volume and noxiousness of the discharges and includes a range of parameters including phosphorous and nitrogen. The charge is payable to Lander (the local government administration) and may only be spent on measures to protect the aquatic environment.

The Hungarian Government has established a product change on petrol. The aim of the product charge is to raise revenue for protective measures to solve transport related pollution problems. Petrol producers or importers pay the charge. The redistribution of funds through a Central Environment Protection Fund, which also draws funds from other environmental fines, product charges, tax revenues and grant funds, could arguably educate and alert beneficiaries of the grant and interest-free loan fund used to redistribute the monies raised for priorities in improving the environment.

Source: IISĐ

Example F: Fiscal Instruments: Italy and Denmark

Italy's plastic bag tax is aimed at encouraging alternatives to plastic bags and reducing the amount of waste plastic. By levying a tax on importers and producers, the Italian government created a signal to the market economy that the cost of plastic bags was greater than the alternatives. This system although very simple has reacted to the environmental impacts of plastic bags, particularly in relation to marine litter and dolphin safety, and sent a clear signal about their undesirability. Over a four-

year period of implementation of the tax program the government raised around US$150M through this tax.

The Danish Government has implemented the Wind Energy Programme to reduce CO_2 emissions from 1988 levels by 20% by 2005, to reduce SO_2 emissions from 1980 levels by 80% by 2000 and to increase the share of Denmark's gross energy consumption provided by renewable energy to 35% - 50% by the year 2030. Denmark levies a tax on all electricity and the basic support mechanism for wind energy is partial rebate of this tax. Together the tax accounts for about 7% of domestic revenue. The complex tax system, which includes 15 subsidy schemes related to energy production and consumption, complements other government measures aimed at encouraging the wind energy industry such as grants partnerships and regulations. The tax system has clear long-term goals and works to change consumer behaviour, create markets and encourage materials substitution.

Source: IISD

Example G: Norwegian Aluminium Industry in Greenhouse Gas Agreements

The Norwegian environment ministry has concluded agreements with the aluminium industry that aim to cut greenhouse gas emissions by 55% per ton of aluminium produced from 1990 levels by 2005. If production remains stable, Norway's overall greenhouse gas emissions would be reduced by 4% CO_2 equivalent over the same period. The agreements between the government and companies such as Hydro Aluminium, Elkem Aluminium and SorNorge Aluminium are the first of their kind in Norway. Emissions from the aluminium industry are not currently covered by

Norway's CO_2 tax, but the government has announced it will impose taxes or regulations on the industry if it fails to live up to its commitment. In return for the industry investing in emissions cuts, the government guarantees it will lower costs for companies in other areas so as not to put them at a competitive disadvantage.

Source: IISD

Example H: OECD Voluntary Industry Commitment on Brominated Flame Retardants

This voluntary agreement was initiated by the major global producers of brominated flame-retardants (substances applied to furniture, appliances and textiles to prevent or minimise the occurrences of fires) who committed themselves to take certain actions to reduce the risks posed during the manufacture and disposal of these substances. These actions include such things as committing themselves not to manufacture or import certain individual flame-retardants, using the best available techniques to improve the purity of others and to minimise the levels of releases that occur during manufacture. Beginning in 1998 and every two years thereafter, companies are to report on progress to the OECD's policy body on chemical safety. If sufficient progress is not made, OECD governments may consider other appropriate actions.

Source: IISD

Example I: Dutch Utilities Sign Agreement on Solar Power

Fifteen parties involved in energy production and sustainable consumption in The Netherlands have signed a voluntary agreement with the Dutch government to increase the use of photovoltaics (PV) solar power for housing and other buildings. The parties, including representatives of power utilities, PV system suppliers, and the

construction industry, will seek more than a 10-fold increase in the number of buildings powered by PV energy between now and the year 2000. The Dutch Minister of Economic Affairs has said that by strengthening the domestic PV industry and market, the country could establish a strong export position as well, selling the systems to developing nations.

Source: IISD

Example J: Australian EcoReDesign Programme

The Australian EcoReDesign programme is about assisting Australian manufacturers from a wide variety of sectors to improve the environmental performance of their products through innovative research, design and development strategies. Funded by the Australian government, the ultimate aim of EcoReDesign was to document several case studies and produce an information video and manual for wider adoption by Australian companies, designers, engineers and others involved in new product design. This is effectively a government initiative to support innovative design for sustainable development.

Source: IISD

Example K: Waste Minimisation Circles: India

The Government of India has launched a campaign to encourage the formation of Waste Minimisation Circles in the industrial sector, especially among small-scale firms. The circles will bring together representatives of industrial units and allow action-oriented discussion on waste minimisation. The groups will meet on a periodic basis and exchange information on waste reduction efforts. An entrepreneur will act as the nodal person for each circle and will be assisted by a resource person

either from universities or technical institutions to feed possible solutions into member firms. The National Productivity Council of India has also produced a manual identifying pollution reducing practices of relevance to small firms. This is effectively government supported links between industry and universities to create specialised skills for increasing business productivity.

Source: IISD

Example L: Industrial Ecosystems at the Metropolitan Level

The United States Industrial Ecosystem Development at the Metropolitan level project aims to demonstrate the value of gathering information about local resource flows and potential partnerships between industries. The project was designed to help both business people looking for ways to cut costs and reduce the use and disposal of natural resources by their businesses and to help people working to create more sustainable communities by identifying ways to turn wastes into useful products and reduce disposal of wastes to air, water and land. 182 industries and institutions joined the project. They each provided data regarding the by-product they had that might be useful for someone else in the project and the inputs they used that might be furnished from another facilities by-products. The project played the role of matchmaker in bringing together potential new partners. In one year possible new partnerships were identified for 48% of the facilities participating in the project. One of the partnerships had the potential to save US$100,000 for one partner and US$70,000 for the other partner per year. This is a project that was established government in a partnership approach addressing waste as an externality and involving business in addressing it.

Source: IISD

Example M: Green Procurement: Sweden

In 1995 the Eskilstuna Municipal Council in Sweden resolved that all procurement of goods and services was to be environmentally adapted. As previous municipal contracts expire; the guidelines are being made to include specific environmental criteria for the product group or services with which central procurement is concerned. The guidelines lay down, for example, that suppliers shall as far as possible declare packaging, transport, waste, etc. material to an environmental assessment of the product.

Source: IISD

Example N: Eco Labelling: Australia

Australia introduced the Environmental Choice Australia EcoLabelling Scheme in October 1991. It is an environmental claim verification programme. It only verifies an environmental claim made by the manufacturer, rather than to select certain product groups and establish criteria for these products based on certain principles or considerations. Random testing ensure the label remains accurate. Large fines can be incurred if manufacturers and service providers are caught making false claims.

Source: IISD

Example O: Volvo: Environmental Management Systems

Volvo's stated aim is 'to contribute actively to the development of efficient, safe, environmentally compatible and economically competitive transport systems for goods and passenger traffic'. To this end, life-cycle assessment (LCA) plays a central role in product development activities. Volvo says it is intensifying its 'preventive environmental activities' in order to ensure that the total environmental

impact of its products is minimised. The average Volvo vehicle has a lifespan of 19 years, and LCA means paying attention to environmentally safe recycling and disposal techniques 20 years into the future. The use of life-cycle assessment revealed that more than 90% of the total environmental impact of Volvo products is generated during their useful life, as distinct from manufacturing and disposal activities. A particularly significant factor is fuel consumption, and for this reason alternative fuels and power trains are a high priority for research. Volvo has declared that 'all business areas shall have their environmental management systems certified in accordance with ISO 14001 no later than 31 December 2001.' Similar requirements have been introduced for its suppliers, with a deadline two years later. Volvo regards its commitment to environmental care as a natural extension of its reputation as a world leader in vehicle safety. It believes it will gain competitive advantage by adopting principles of sustainability. Volvo's environmental policy, adopted in September 1997, is characterised by a holistic view, which strives for continuous improvement, technical development, and resource efficiency. Volvo is proud of its achievements in reducing toxic emissions. In 1976, it became the first automaker in the world to introduce a three-way catalytic converter. Since 2000, Volvo has offered an optional exhaust filter that reduces emissions of carbon monoxide, hydrocarbons and particulates by 80 to 90%. Volvo's environmental policy is constantly evolving. In January 2000, Volvo introduced 'quality gates' (or evaluation points) into the product development process. Meanwhile the E-FMEA (Environmental Failure Mode and Effect Analysis) is a systematic method of analysing the environmental hazards associated with new products, and of monitoring the chemicals used in products and manufacturing processes.

Source: BSD Global

Example P: Ebara: Zero Emissions Research Institute

Ebara, the first company to incorporate the 'zero emissions research initiative' (ZERI) concept, is a Japanese engineering firm with expertise in fluid control systems, environmental engineering and precision machinery. An electron-beam flue gas treatment system developed by Ebara eliminates pollution by simultaneously removing sulphur dioxide and nitrogen oxides. This process produces a marketable by-product that can be used as an agricultural fertiliser. Another of Ebara's products converts industrial and municipal waste into useful chemicals such as ammonia, methane, hydrogen and gasoline. The fluidised-bed gasification combustion and ash melting system allows valuable metals, including iron, copper and aluminium, to be extracted for recycling. In addition, heat from the system can be used for power generation. At its Fujisawa plant, Ebara has constructed an eco-industrial park, which makes use of this combustion system. The park is intended to demonstrate the principle of 'zero emissions', and provides logistical support for all constituents of the park, including factories, dwellings, shops and agricultural facilities. The 'Zero Emission Centre' contains plants for water purification, sewage and night-soil treatment, and for electricity generation. It has been created to serve as a model for zero emission communities.

Source: BSD Global

Example Q: Kalundborg: Industrial Ecology

One of the best-known examples of industrial ecology can be found in Kalundborg, a small industrial zone 120km west of Copenhagen in Denmark. Over time, this

unplanned industrial park has evolved from a single power station into a cluster of companies that rely on each other for material inputs. The project began in 1972 and by 1994 had negotiated 16 contracts. The extent of the material and energy exchanges in 1995 was about 3 million tonnes a year. Estimated savings totalled US $10 million a year, giving an average payback time of six years. The core participants are:

Asnaes, Denmark's largest coal-fired power station;

An oil refinery owned by Statoil;

A pharmaceuticals plant owned by Novo Nordisk;

Gyproc, Scandinavia's largest plasterboard manufacturer;

The municipality of Kalundborg, which distributes water, electricity and district heating to around 20,000 people.

The symbiosis has grown over the years to include partners from other districts, as well as farmers. The participants exchange materials and energy for mutual benefit, on the basis that the others can use by-products from one business as low-cost inputs. For example, treated wastewater from the Statoil Refinery is used as cooling water by the Asnaes power station. Meanwhile Statoil and Novo Nordisk purchase 'waste' process steam from the power station for their operations. Surplus heat from the power station is used for warming homes in the surrounding area, as well as in a local fish farm. The power station produces other valuable by-products including 170,000 tonnes a year of fly ash, which is used in cement manufacturing and roadbuilding. The wallboard company, Gyproc, uses the power plant's fly ash to obtain gypsum, a by-product of the chemical desulphurization of flue gases. Gyproc purchases about 80,000 metric tons of this material each year, meeting almost two-

thirds of its requirement. Surplus gas from the Statoil refinery, which used to be flared off, is now delivered to the power station and to Gyproc as a low-cost energy source. Local farmers, meanwhile, make use of Novo Nordisk's by-products as fertilisers. Industrial enzymes and insulin are created through a process of fermentation, the residue from which is rich in nutrients. After lime and heat treatment, it makes an excellent fertiliser. Some 1.5 million cubic metres a year is delivered to local farmers, free of charge. Originally, the motivation behind the clustering of industries at Kalundborg was to reduce costs by seeking income-producing applications for unwanted by-products. Gradually, though, industry managers and local residents realised that they were generating environmental benefits as well. This project has enabled its participants to achieve substantial cost savings and to improve their resource efficiency. Gyproc has recorded a 90-95% saving in oil consumption after switching to gas supplied by the adjacent refinery. In addition to these reductions, the use of the excess heat from Asnaes for household heating has eliminated the need for about 3,500 oil-burning domestic heating systems.

Source: BSD Global

Example R: DuPont: Sustainable Growth

To achieve sustainable growth, Dupont focuses on improved productivity to drive down costs, waste production, and energy demand. It has three core strategies:

Using its knowledge to reduce consumption of raw materials and energy;

Integrating chemistry, biology and technology to create products with greater societal value and lower environmental impact;

Engaging stakeholders.

As part of its 'Responsible Care' strategy (a code of conduct developed by the Canadian Chemical Manufacturers' Association) DuPont aims to increase transparency and communications between the plants and the communities in which they operate. DuPont has a policy of consulting with external groups on global issues that affect its work.

The 'DuPont Commitment' outlines several specific targets:

Zero injuries, illnesses and incidents;

Zero waste and emissions;

Conservation of energy and natural resources, and habitat enhancement;

Continuously improving processes, practices and products;

Open and public discussion, and influence on public policy;

Management and employee commitment, accountability

In partnership with its own customers, DuPont has achieved some notable successes in eco-efficiency. DuPont Canada's performance coatings business initiated a partnership with Ford at its car assembly plant in Oakville, Ontario. Using a new contract based on the number of cars painted, rather than the quantity of paint consumed, DuPont helped Ford achieve significant savings. As a result, hydrocarbon emissions from the plant have dropped by 50%, and costs are down by a third. Since 1991, the DuPont Carpet Reclamation Program has reclaimed more than 60 million pounds of carpet. According to DuPont, it is the only viable carpet reclamation program that reclaims and recycles all types of used commercial carpet. Recycled content is used to manufacture carpet fibre, floor tiles, carpet cushion, sod reinforcement and automobile parts. DuPont envisages further reductions in the size

of its ecological footprint. Its goals for 2010 include sourcing 10% of its energy from renewable sources; and to achieve 25% revenues from non-depletable resources.

Source: BSD Global

Example R: AMP: Life Cycle Assessment

AMP is a leading producer of electrical and electronic connectors, including cutting edge technologies in fibre-optics, wireless technology and sensors. The company defines Design for Environment (DFE) as ensuring that they meet their customers' demands in an environmentally responsible manner. In the past few years, the company has made a major investment in DFE. Working with the University of Wisconsin, AMP developed a DFE training programme. AMP engineers are given a detailed eight-hour training course that emphasises the importance of considering environmental criteria when selecting product materials, and this enables them to apply the pollution prevention hierarchy in product design. In addition AMP engineers gain a better understanding of industrial ecology while learning to use a simplified life cycle analysis tool when designing, developing, manufacturing, packaging and distributing AMP products. Since the scheme was launched, several thousand engineers have received DFE training. In 1996 a 70-minute video presentation was developed and distributed to each country environmental co-ordinator and DFE awareness training was provided. By designing with the environment in mind AMP has:

Eliminated the use of packaging containing ozone-depleting chemicals and heavy metals

Substituted unbleached cardboard in place of bleached cardboard

Reduced packaging materials by recycling and reusing wood pallets

XXX

Increased post consumer recycled content in packaging.

Source: BSD Global

Example S:Dow Jones Sustainability Indexes (DJSI): Sustainability Reporting

In September 1999 Dow Jones launched the first global indexes tracking the performance of companies which are leaders in sustainable development. The Dow Jones Sustainability Indexes are designed to meet the demand for:

A global, rational, consistent and flexible index to benchmark the performance of investments in sustainability companies and funds; and

An independent, reliable index as a basis for derivatives and funds focused on sustainability companies.

The DJSI combines the resources of Dow Jones & Company, the world's leading global index provider, and SAM Sustainability Group - a Zurich-based company specialising in integrated corporate sustainability in financial services and a pioneer in corporate sustainability assessment. The Dow Jones Sustainability World Indexes (DJSI World) consists of more than 300 companies in more than 30 countries. They track the performance of companies that lead the field in terms of corporate sustainability world-wide. They comprise one composite index plus five more narrowly defined indexes that exclude companies engaged in particular 'undesirable' businesses. These are as follows:

DJSI World excluding alcohol;

DJSI World excluding tobacco;

DJSI World excluding gambling;

DJSI World excluding armaments and firearms;

DJSI World excluding alcohol, tobacco, gambling, armaments and firearms.

Source: BSD Global

Example T: Ikea: Corporate Sustainability

Ikea, the international retailer of furniture and household goods, has a reputation for low prices and fresh, innovative design. However, it is also keen to develop a reputation for environmental stewardship and sensitivity to social issues. In September 2000, Ikea launched The Ikea Way on purchasing home furnishing products, a three-page 'code of conduct' for its 2,000 suppliers, focusing on working conditions and environmental impacts. As a first step, suppliers were asked to return a questionnaire to ascertain how well they already complied with the code. External auditors have been appointed to carry out more detailed reviews and to verify the information provided by Ikea's suppliers. Where shortcomings are identified, the companies will be asked to put in place an action plan to remedy them. The code warns suppliers: 'Repeated violations of IKEA's requirements will result in the termination of co-operation.' Ikea has also shown itself not to be shy of working with lobby groups. As long ago as 1991, it collaborated with Greenpeace to find a way of printing its catalogues on chlorine-free paper. Several years later, Greenpeace was enlisted again, this time to advise Ikea on how to phase out PVC from its product range. Since then, PVC has been eliminated from all goods with the exception of electrical cables, and a 100% phase-out is scheduled for 2006. At the end of the 1990s, pressure from Greenpeace and other environmental groups led Ikea to introduce a policy prohibiting the use of wood from intact natural forests, except those certified by the Forest Stewardship Council. This was formally launched in November 1999. Ikea is also keen to send its customers the appropriate signals about

social and welfare issues. A two-page code of conduct relating specifically to the subject of child labour makes clear: 'Ikea disassociates itself from child labour, and works actively against it.' To this end, the retailer requires suppliers to keep it informed about where production is taking place - including the activities of subcontractors. In 2000 Ikea donated US$500,000 to a three-year project aimed at eliminating child labour in Uttar Pradesh, one of India's least developed states. The focus of the project is the introduction of education facilities for children and women alike.

Source: BSD Global

Example U: Otto Versand: Social Responsibility

Otto Versand, based in the German city of Hamburg, is the largest mail-order catalogue group in the world, and has SA8000 membership. The company is heavily reliant on imports from developing countries, particularly clothing and furniture. As such, it recognises the need to encourage socially responsible employment practices among its suppliers - not least for commercial reasons. In 1996, Otto Versand became the first mail order company to sell carpets carrying the 'Rugmark' seal, a labelling scheme launched by UNICEF to indicate that the product was not manufactured using child labour. One percent of the sale price went towards children's education in the country of manufacture. In 2000, the company's commitment to social responsibility earned it the 'Preis für Unternehmensethik', or corporate ethics prize, by DNWE, the German Network of Economic Ethics. Before the development of SA8000, Otto Versand had developed a code of conduct with which its suppliers were expected to comply, based on International Labour Organisation rules. These prohibit child labour, require payment of at least the

statutory minimum wage, and specify a maximum 48-hour working week plus up to 12 hours' overtime. The code also gives employees freedom to join a union and to negotiate wages, prohibits forced labour, and promotes safe and healthy working conditions. Enforcing the code is a complicated business. The technique employed by Otto Versand to ensure compliance with its code of conduct involves inviting suppliers to attend training sessions at its regional headquarters. Here, managers are introduced to the code, and shown how they might go about achieving compliance. The company's eventual aim is for its suppliers to achieve certification under the SA8000 scheme. Its efforts to promote social responsibility are carried out with this in mind. It is expected that SA8000 will gradually replace Otto Versand's own auditing system. In 1999/2000, the company's auditors carried out social responsibility checks on more than 200 of its main suppliers and subcontractors in seven countries: Turkey, the Philippines, Vietnam, Thailand, Indonesia, South Korea and India. The results revealed that most of Otto's main suppliers (84%) needed to take no further action in order to comply with the firm's code of practice. Of the small number of sub-standard suppliers, most were in India and Indonesia. Among subcontractors, however, compliance with the code was generally lower. Only half of the operations audited were found to need no further development. In the Philippines and South Korea, more than three-quarters of subcontractors failed to meet the necessary standards.

Source: BSD Global