



The Impacts of Climate Change on European Employment and Skills in the Short to Medium-Term: Company Case Studies

Final Report (Volume 1)

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Medium-Term: Company Case Studies

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1 INTRODUCTION

1.1 Purpose of the Report

GHK Consulting was commissioned to produce material for the Restructuring Forum to be held on 22 and 23 June on the impact of climate change on EU employment in the medium term (to 2020). In particular the material comprises:

- Fifteen company cases studies across a range of sectors examining how businesses are being influenced by, and responding to climate change and related policies, with a summary report pulling out the main lessons (Volume 1); and
- A literature review in the field of climate change and its impact on employment (Volume 2).

This report is Volume 1 and presents 15 detailed company case studies that explore the main climate change drivers affecting companies; the key responses both internally and externally directed; the impacts on company financial performance, jobs and skills; and the future directions and lessons from experience to date.

1.2 Approach to the Selection of the Case Studies

The companies studied were selected to cover a range of sectors (see Table 1) with different types of exposure to climate change policy drivers: energy, energy intensive, employment intensive and transport sectors.

Table 1: Categories of Sector from which to Select Individual Businesses

Criteria for Selection	Title and Characteristics of the Category	Exemplar Sectors
Energy (carbon) generating sectors	Energy Generation and Supply: Sectors responsible for manufacture and supply of energy, subject to policies that restrict or encourage the types of technologies used and policies that change relative prices between different products	Electricity, gas, coal, transport fuels,
Employment Intensity of Sectors (jobs per unit output)	Customer Focus: Sectors employing large numbers of people and supplying goods and services that are likely to be subject to changing demands as a result of climate change policies, including (but not mainly) as a result of income effects due to higher energy costs	Construction, retailing, tourism
Competitive Intensity of Sectors (EU export, import ratios)	Energy Intensive: Sectors that are subject to high levels of international competition and using high levels of energy, where 'uneven playing fields' due to EU climate policies may have a significant effect on costs and competitiveness	Cement, chemicals, metals
Vulnerability to Climate Policies (risk assessment)	Transport: Transport sectors provide products and services which are likely to be subject to especially focused policies and where the scope for significant changes in service / product offers maybe limited	Airlines, Vehicle and vehicle component producers, Multi-modal providers

This sectoral typology was suggested by the economic context for assessing restructuring and in particular the analysis based on a review of the literature (Volume 2) as to which sectors were likely to be most sensitive to climate change and related policies.

Within these sectors, companies (Table 2) were sought that were leaders in their sector and likely to demonstrate cutting edge practices. This also means that selected companies tended to be those who were generally positive about the climate change agenda and proactive in responding. The purpose of this selection was to give a picture of future trends and directions. All companies were large ranging from employing 425 to 500,000 full time employees (FTEs), with the majority being very large. They were also based in a range of EU countries with most operating across Europe and many internationally.

Table 2: Case Study Companies

Sector	Company	Country	Employees
Energy	SWM	Germany	7,000
	Enel	Italy	85,000
	Stratkraft	Norway	3,000
Energy intensive - Cement	Holcim	Switzerland	90,000
	Cementa	Sweden	425
Energy intensive – Food and Drink	Coca-Cola	US	90,500
	Cadbury	UK	45,000
Employment intensive - Retail	ANCC-COOP	Italy	55,450
	M&S	UK	75,000
	Carrefour	France	495,000
Employment intensive - Construction	Vinci	France	164,000
Transport – Air	Virgin Atlantic	UK	9,000
	Air France KLM	France/Holland	105,000
Transport - Haulage	Menzies	UK	4,000
	Deutsch Post - DHL	Germany	500,000

The case studies have used interviews with senior company officers and company documentation to explore:

- the main climate change drivers affecting companies;
- the key responses both internally and externally directed;
- the impacts on company financial performance, jobs and skills; and
- the future directions and lessons from experience to date.

The next chapter presents a synthesis of the main findings from the case studies. Following sections present the detail case studies.

2 A SYNTHESIS OF THE FINDINGS FROM THE COMPANY CASE STUDIES

2.1 Structure of the Synthesis

Each case study has a common structure that examines:

- The main drivers influencing business performance and response
- The actions taken so far by businesses in response to these drivers
- The impacts so far on the company and especially on employment and skills
- The potential implications for the company of continuing climate change
- The lessons for business more generally that the companies have identified.

The synthesis follows this structure.

2.2 Overview of the Findings

Table 3 presents a brief overview of findings from the case studies. In brief:

Climate change and related policy drivers

- The main drivers to-date relate to policies rather than the physical effects of climate change or immediate competitive pressures
- Regulation has been more important than corporate CSR policies except for airlines

The actions taken so far by businesses in response to drivers

- Internally, the major measures taken to-date are those to improve energy efficiency. Measures to substitute goods and services that have high energy intensity have also been widespread, having immediate effects on suppliers
- Externally, companies have built partnerships to lobby and to manage responses

The impacts of climate change policies especially on employment and skills

- Impacts have tended to be in relation to skills rather than on the actual levels of employment
- There is a widespread need for new skills and a general need for upskilling, met by substantial activity in the introduction of new training programmes, especially in technical competencies

The potential implications for the company of continuing climate change

- Companies see themselves as anticipating and positioning themselves to be ahead of any future climate change policy drivers
- No major changes are expected in corporate strategy except in cement and airlines where major consequences of the EU ETS are expected

The immediate lessons for business more generally

- The main common lesson is the benefit of engaging with climate change policy drivers from a place of leadership with a clear strategic direction.
- Other common lessons include: the need to engage early with policy processes in order to influence them; the need to engage with staff and raise their awareness, and to build the capacity of staff through acquisition of skills and training; and the need to engage with the supply chain by monitoring their environmental impact, raising their awareness and helping them to adopt energy saving production models

Table 3: Brief Overview of Findings

	Sector	Energy			Energy intensive - Cement		Energy intensive – Food and Drink		Employment intensive - Retail			Employment intensive -	Transport - Air		Transport - Haulage	
	Company	SWM	Enel	Stratkraft	Holcim	Cementa	Coca-Cola	Cadbury	ANCC-COOP	M&S	Carrefour	Vinci	Virgin Atlantic	Air France KLM	Menzies	Deutsch Post - DHL
Climate change policy drivers	CSR and Reputation	✓	x	x	✓	✓	✓	✓	✓✓	✓✓	✓✓	x	✓	✓	✓	✓
	Physical	x	✓	✓	x	x	✓	x	x	✓	✓	✓	x	x	x	x
	Regulation	✓✓	✓✓	✓✓	✓✓	✓✓	✓	✓✓	✓	✓✓	✓	✓	x (in ETS from 2013)	x (in ETS from 2013)	✓	✓
	Competitiveness	✓	✓	✓	✓	✓	✓	✓	✓	x	x	✓	✓	✓	✓	✓
Internal measures	Measures to increase energy efficiency;	x	✓✓	x	✓	✓✓	✓	✓✓	✓✓	✓✓	✓✓	x	✓✓	✓✓	✓	✓
	Substitution of inputs and materials;	✓✓	✓✓	✓✓	✓✓	✓	✓	✓	x	✓	✓	✓✓	NA	NA	x	x
	Sales of greener products; and	✓	x	x	✓	✓	x	✓	✓✓	✓	✓	✓	✓ (offsets)	✓ (offsets)	x	✓
	Actions to reduce climate vulnerability.	x	x	x	x	x	✓	x	x	✓	x	✓	✓	✓	x	x
External measures	Working with supply chains	x	x	x	✓	x	✓	x	✓✓	✓	✓✓	✓	x	✓	✓	✓
	Influencing customer behaviour	x	✓	x	✓	✓	x	✓	✓✓	✓	✓	✓	✓	✓	✓	✓
	Trading in carbon allowances	x	✓✓	✓✓	✓✓	✓	x	✓	x	✓✓	x	x	✓	✓	x	✓
	Engaging with the policy process	✓	✓	✓	✓	✓	✓	✓	✓	x	✓	x	✓	✓	x	x
	Working in partnerships	✓	✓	x	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓	✓	✓	✓	✓	x
Impact on Jobs	Direct Jobs	✓	?	✓	✓	x	✓	?	✓	✓	✓	✓	✓	?	x	✓
	Indirect Jobs	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	?	x	x
	Upskilling	✓	✓	✓	✓✓	✓✓	✓✓	✓✓	✓	✓	✓✓	✓	✓✓	✓✓	✓	✓
Impact on skills	Environmental training programmes (Corporate)	x	x	x	✓	✓	✓	✓	✓	x	✓	✓	✓	✓	✓	✓
	Environmental training programmes (Technical)	✓	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Tailored training packages	x	x	x	✓	x	✓	x	✓	✓	x	x	✓	✓	✓	✓

2.3 Key Climate Change Drivers for Change So Far

The main drivers identified across the case studies were:

- **Corporate Social Responsibility and Reputation:** most of these companies have strong corporate brands and want to be seen to be 'doing the right thing', which they see as including taking action on climate change. They saw this as important for their relationships with customers, investors and other stakeholders.
- **Competitiveness:** companies increasingly saw that taking action on climate change was becoming a source of competitive advantage and was important for them maintaining a leadership position, while being overly carbon dependant and not developing low carbon products would become a disadvantage if it wasn't already.
- **Regulation:** the EU ETS and the Renewables Directive were the strongest regulatory drivers, but generally there was a perception of the likelihood of increasing regulation, which could potentially be a risk or an opportunity depending on its design and the leadership position of the company.
- **Physical:** some companies recognised that they were exposed to risks from water shortages resulting from climate change such as those using substantial quantities of water in manufacturing (Coca Cola; Cadbury) and energy companies using hydro power (Statkraft; Enel).

The dominant current drivers varied between the different sectors:

- Regulation was the dominant driver for the energy and cement sectors as they were most affected by the EU ETS and were traditionally most heavily regulated.
- CSR and reputation was the dominant driver for the food and drink and retail sectors as they had very strong brands and were relatively lightly regulated.
- Competitiveness was a dominant driver for the transport haulage sector as fuel was some a major cost in a very low margin business – costs and carbon were 'joined at the hip' (Menzies).

For other sectors there were not so clearly dominant drivers:

- Fuel costs were also a major driver for airlines, but also CSR was clearly important as flying increasingly came under attack for its carbon impacts, while future inclusion in the EU ETS was a major regulatory risk.
- For construction CSR was an issue as well as competitive positioning, while regulation remained a potential risk or opportunity.

2.4 What Companies have been doing so far

All companies examined have taken or are planning to take major actions to reduce their carbon impacts. Most have targets related to carbon reduction of various types. For example:

- 30% reduction in CO₂ tonnes per Kg of product transported by 2011 from 2001 (Menzies)
- 5% reduction in absolute CO₂ tonnes from 2004 with target dates varying between country (Coca Cola)
- 20% renewable energy supply by 2020 from current base of 4.3% (SWM)
- 20% energy reduction by 2015 (Carrefour)

Most have researched their carbon impacts in detail using carbon accounting, footprinting and life-cycle methodologies to establish where their main impacts are within their company, in their supply chains and in the use of their products and services. For many companies this highlighted the importance of emissions outside their immediate control:

- Menzies calculated that their total supply chain produced about 4.73 million tonnes of carbon a year, while the company produce 37,500 tonnes.
- M&S identified that about 75% of the carbon footprint of clothing can result from customer care ie washing, drying and ironing of clothes.
- Carrefour identified that the major impacts of many products was in production or use.

This work has helped to set their targets and prioritise their actions to reduce their carbon impacts.

2.4.1 Internal actions and measures

The key actions can be divided into four main areas:

- Measures to increase energy efficiency;
- Substitution of inputs and materials;
- Sales of greener products; and
- Actions to reduce climate vulnerability.

Energy efficiency

All companies have sought to increase their energy efficiency i.e. the ratio of output to energy input by a whole range of activities of which the key ones are:

- **Investing in new plant:** this includes investment in more efficient fossil fuel power stations (Enel), renewing aircraft fleets (Air France KLM; Virgin Atlantic), renewing truck fleets (Menzies; Deutsche Post DHL, Coca Cola) and moving investment from wet to dry kilns (Holcim);
- **Improving building energy efficiency:** most companies have sought to increase their buildings' energy efficiency;
- **Improving transport efficiency:** this includes for the transport sectors training drivers/pilots, optimising routes and reducing weight in aircraft.

Substitution of inputs

Most companies have substituted inputs to some extent:

- Replacement of fossil fuel with renewable sources (all sectors to differing extents)
- Replacement of HCFCs with CO₂ in refrigeration units (Retail)
- Replacement of clinker with waste materials (Cement)

Sales of Greener Products

There are various examples of the development of greener products:

- 100% renewable electricity product (SWM);
- Sales of a range of greener products (Retail);
- Development of greener buildings and communities (Vinci); and
- Development of 'GOGREEN', a carbon neutral transport service (Deutsche Post DHL).

Actions to reduce climate vulnerability

Actions in this area tend to be limited to those companies with significant risks in this area such as:

- Water reduction programmes (efficiency, sustainable supplies & recycling) are to be in place in 100% of 'water scarce' sites (Cadbury).
- Water used in finished beverages will be 'offset' through local projects supporting communities and nature (Coca Cola).

2.4.2 External actions and measures

The main areas for action can be divided into the following areas:

- Working with supply chains
- Influencing customer behaviour
- Trading in carbon allowances
- Engaging with the policy process
- Working in partnerships

Supply chains

As noted above, many companies have examined their carbon footprint and identified that their supply chains are major contributors to the overall impact of their products and services. This has led to a wide variety of initiatives to work with supply chains to reduce carbon impacts, which often includes working with SMEs. Some examples of these are:

- Cadbury produced a best practice guide for farmers in Low Carbon Dairy Farming after identifying that 60% of emissions from the production of dairy milk chocolate bars related to milk production;
- ANCC-COOP has launched an initiative for engaging suppliers on greenhouse gas emission reduction and energy saving actions on a voluntary basis providing practical suggestions, case studies and a self-evaluation tool-kit on greenhouse gas emissions. ANCC-COOP has also tried to raise awareness amongst suppliers by organising workshops and preparing an informative publication;
- Carrefour sent a questionnaire to 600 own-brand suppliers on their environmental performance, which they later amended to use a more user friendly self-assessment tool that particularly SMEs would find easier to use and more useful for identifying actions to improve their performance;
- M&S worked with the Carbon Trust in the UK to identify its greatest carbon "hot spots" within its supply chain and is now working with suppliers to reduce them;
- Vinci expects its concrete suppliers to provide information on carbon emissions and to innovate to reduce them as part of its supplier relationship;
- Deutsch Post DHL has developed a supplier code of conduct with a key message to SMEs to implement environmental management systems.

Customer behaviour

Again this area of activity has been identified as often important in the overall carbon footprint of products and services. Activity is less extensive than work with supply chains but there are a number of examples in the energy, retail and construction sectors. Examples include:

- Enel fitted 'smart' electricity meters for its customers so electricity use can be monitored on a real time basis encouraging energy efficiency;
- M&S put in place a major educational campaign, "Think Climate Wash at 30°C", which achieved a 15% increase in customers washing at the lower temperature, saving 25,000 tonnes of carbon annually;

- Vinci has worked with its customers of motorways to assist in promoting eco-driving practices;
- ANCC-COOP undertakes regular information campaigns to raise consumers' awareness. Recently, a guideline on how to reduce energy consumption in daily activities has been prepared and tested on 2,500 families;
- Cementa worked with the Swedish National Road and Transport Research Institute to increase the potential for concrete roads to lower fuel consumption for cars and trucks.

Carbon Trading

A small number of companies have become active in trading in carbon allowances:

- Statkraft was a pioneer trader in 'green energy' products such as renewable energy certificates and carbon allowances and has developed a standalone trading business;
- Enel has invested substantially through the Clean Development Mechanism and Joint Initiatives in creating carbon reduction certificates and trading in them;
- Holcim has set up a subsidiary company 'Holcim Environment Services Trading' which translates CO₂ saving into monetary value. The company provides information for trading under the EU-ETS by first balancing allowances internally then trading (buying for compliance or selling the excess);
- Cadbury has seven sites subject to the EU ETS and intends to invest in energy saving measures to sell excess carbon credits.

The Policy Process

Most companies have engaged with the policy process. This is particularly important for companies with strong regulatory risks and opportunities. So for instance:

- The cement sector has commissioned research on the impact of auctioning in the EU ETS and has lobbied for reform;
- The Airlines have also extensively engaged with the EU ETS policy process given that their emissions are to be included in 2013;
- In the energy sector, SWM has set up an office in Brussels to assist in engaging with the policy process.

Partnerships

All companies have engaged in a wide range of different partnerships to research, lobby and develop projects. For instance:

- Energy companies see this as an essential means of sharing risk, skills and expertise in the development of new power capacity;
- Holcim initiated the World Business Council for Sustainable Development's member-led Cement Sustainability Initiative;
- ANCC-COOP has established cooperation agreements on climate change issues with national stakeholders such as the Italian Ministry of Environment for sustainable buildings and with local governments for car sharing;
- Coca Cola are part of the Water Footprint Network, which promotes the transition towards sustainable, fair and efficient use of fresh water resources worldwide.

2.5 Impacts on Company Performance

In general it is difficult to see direct impacts on company sales and profits from responses to climate change drivers, with a few exceptions:

- Energy companies, particularly Statkraft with its production dominated by hydropower, have directly benefited from increases in energy prices resulting from the EU ETS;
- Transport haulage companies have directly benefited from the reduction in costs of fuel driven by energy efficiency initiatives.

In general, companies see the main benefit as increasing investor confidence that they are 'ahead of the carbon game' and this is perceived as likely to improve their future competitiveness.

2.5.1 Barriers and Risks

The current economic climate and institutional factors can also lead to barriers and risks for companies complying with climate change policy drivers. Renewable energy projects, in particular, are already facing constraints from restrictions on accessing finance. Some companies are particularly exposed to risk associated with the EU ETS. Some of the specific barriers and risks are:

- Enel envisages risks arising from the need for electricity transmission networks to adapt to link in to renewable energy plants. Climate change will also be likely to impact on Enel's hydropower production capacity as water suppliers are affected;
- Air France KLM is currently facing a number of barriers to accessing finance. A recent European Investment Bank (EIB) ruling has excluded financing for airlines under their 'green economy' loans. The company has lost 10 of the 25 banks it used to work with for aircraft financing. Moreover, Air France KLM is unable to access state guarantee for large loans due to a new OECD agreement which prohibits access to state guarantees (Export Credit Agencies) when a major airline manufacturer (in this case Airbus) is located in the same country;
- Coca-Cola believes the high cost of innovative technology is a significant barrier. Climate change policies should provide financial incentives that encourage companies to take commercial risks.

2.6 Impacts on jobs and skills

2.6.1 Jobs

The main direct employment impact identified was the recruitment of environmental specialists to inform their responses to the climate change challenge. For examples:

- SWM hired about 10 specialist in renewable energy and climate change strategies;
- Statkraft employs about 50 staff in their wind power team leading on investment in wind power;
- Holcim corporate head office employs 6 people working on climate change issues such as engagement with policy makers, internal communication and sustainability management;
- Carrefour has recruited a team of 6 to manage its sustainability performance;
- Marks and Spencer's climate change related initiative, Plan A, has led to 20-30 new jobs; and
- Vinci has created 4 new jobs in its sustainable development team since 2000;

In other cases, companies have bought in consultancy advice rather than recruited (Cadbury; ANNC-COOP). These positions and their expertise were crucial for informing company strategic direction and integrating climate change responses throughout their operations. However the jobs are generally counted in tens, while the companies have thousands of staff. Hence they are not significant in numbers.

In general companies saw re-skilling staff as more significant than new jobs as climate change driven changes were integrated into current activities (see next section). This is not surprising as the major response to climate change drivers in companies has been to increase energy efficiency. Effectively this means doing largely the same business activities with reduced energy use. The main means of achieving this has been improving the skills of the current work force to manage energy use rather than a significant change in staff numbers. The main exception to this is Menzies where optimising routes had led to the need for less drivers although this was claimed to be counterbalanced by increased business, partly resulting from their more competitive position due to efficiency gains driven by climate change.

The further potential area for job impacts is in the supply chains including SMEs. There are two main ways that these companies have impacted on their supply chains:

- Working with their suppliers to improve their environmental performance; and
- Substituting inputs either through the same supplier or by changing suppliers (Cementa).

In the first case, many of the initiatives are set out in the section above on supply chains. They generally involve providing advice, guidance etc on reducing their suppliers' environmental impact which is likely to have an impact on suppliers, particularly in terms of skills, but may also lead them to recruit environmental experts in a similar manner to the case study companies. However case study companies were not able to provide any information on jobs and skills impacts in their suppliers.

Substituting inputs may have a greater impact on jobs. Potentially generating energy from renewable sources rather than fossil sources could impact on jobs. Likewise substituting refrigerators using HCFC with those using CO₂, as well as substituting traditional packaging with eco packaging, could impact on jobs. The key question is the labour intensity involved in the production of the new input compared to the old input. However companies did not have this information and so were not able to quantify these impacts.

In general, companies did not have any interest in the job impacts in their supply chain due to their environmental initiatives and hence lacked information on this issue. Furthermore, it is not information that their supplier is likely to share readily. The only exception to this was in Statkraft and Cementa. Statkraft had considered looking at the job impacts of hydropower projects in order to justify them to stakeholders but had yet to take action to study this. Cementa's two plants in Sweden support around 23 – 25 direct and indirect jobs related to the demand for alternative fuels. Cementa have hired services from other companies to process, cut and handle the raw materials to be used as fuel.

2.6.2 **Skills**

All companies saw skills as a major area for impact from climate change drivers and much more significant than impacts on the numbers of jobs. All companies, except the energy companies, had environmental training programmes to raise general skills and awareness of environmental and climate change issues, energy efficiency opportunities etc. Beyond this general training different companies had tailored training to address their specific needs. For example:

- Kiln operators in Holcim are trained on a fuel mix optimiser combined with financial software which evaluates savings from different fuel mixes for producing cement;
- Coca Cola trained its packaging designers to develop lighter packaging;
- Virgin Atlantic has trained its pilots in more fuel efficient procedures for take-off and landing;
- ANCC-COOP has a training centre (the "COOP School"). Training on sustainability and climate change is part of mainstream training programme for head of sale points.

Specific training modules are also organised on specific topic (for example on packages and recycling) and when new technology or management procedures are introduced (i.e. waste reduction, recycling, energy saving and management);

- Menzies has trained its drivers extensively, with refresher courses, in more fuel efficient driving.

2.7 Future implications of climate policy drivers

In general the companies see themselves as taking a leading role and positioning themselves to anticipate future climate change policy drivers. They do not expect strategic responses will radically change. So for instance the companies in the UK, who will be affected by the Carbon Reduction Commitment trading scheme after 2010 aimed mainly at improving building energy performance, see themselves as well positioned to benefit from it. There are two major exceptions to this:

- The cement sector claims its international competitiveness is threatened by the move to increased auctioning in the EU ETS in 2013, estimating losses of 40,000 direct jobs and €4.2 bn gross value added according to a study by the Boston Consulting Group for Cembureau¹.
- The airline sector claims that the current proposal for the inclusion of its emissions in the EU ETS in 2012 could undermine the competitiveness of the European airline industry and hence its global leadership in the fight against climate change, which is supported by an independent assessment estimating costs to the industry of €40-65 bn².

2.8 Lessons for other companies and sectors

A wide range of lessons have been suggested by the different companies. The main common lesson suggested is the benefit of engaging with climate change policy drivers from a place of leadership with a clear strategic direction. Other examples of common lessons include:

- The need to engage early with policy processes in order to influence them (SWM; Enel; Vinci);
- The need to engage with staff and raise their awareness (Statkraft; Holcim; ANCC-COOP; Carrefour; Vinci; Virgin Atlantic; Menzies; Duetsche Post DHL);
- The need to build the capacity of staff through acquisition of skills and training (SWM; M&S; Vinci; Air France KLM; Menzies); and
- The need to engage with the supply chain by monitoring their environmental impact, raising their awareness and helping them to adopt energy saving production models (Cadbury; ANCC-COOP; Carrefour). There are benefits when larger companies share their climate change expertise with SMEs from the supply chain by providing voluntary code of conducts, self-evaluation toolkit, real-life case studies and sharing of good practices.

¹ http://www.cembureau.be/Cem_warehouse/CEMBUREAU%20PRESS%20RELEASE%20-%20PRESS%20CONFERENCE%20-%20CARBON%20LEAKAGE.PDF

² http://www.europarl.europa.eu/hearings/20070627/tran/ambrose_summary_en.pdf

3 CASE STUDY 1: ENEL

3.1 Summary

Enel is a very large Italian and international energy company, Europe's second listed utility by installed capacity. Having been a state owned monopoly, it is now a private company with less than 30% of shares owned by the Italian State. 36% of its generating capacity is from renewables, which is largely hydropower.

The main climate change drivers for Enel are the EU ETS and Renewables Directive although these involve risks in terms of how they develop. Overall Enel sees climate change drivers as less significant than competition and globalisation drivers.

Enel has responded to climate change drivers by investing in best available technology for thermal generation; investing developing renewables inside and outside Italy; increasing energy efficiency; researching CO₂ capture and sequestration and innovative renewable technologies; and globally reducing emissions through international projects.

Enel has engaged with its customers particularly through installing smart meters; taken an active role in shaping climate change policies; and ranks among the top players in the global market for emissions reductions.

Enel does consider that climate change has significantly affected its company performance.

Enel employs about 2,600 staff in activities related to its operations of renewables and its research and development out of total employees of about 85,000, although it is not clear what proportion of these jobs are new arising specifically from climate change drivers. Enel see a range of technical and marketing skills becoming more important with the development of renewables, increasing nuclear energy and development of carbon capture and sequestration.

Enel see a future strengthening of climate change drivers strengthening their need to collaborate with other companies and gain new skills.

A key lesson for Enel has been the need to engage with the EU policy making process.

3.2 Introduction

Enel is very large Italian and international energy company with 85,000 employees and a posted turnover of €43.7 billion in 2007. It is Italy's largest power company, and Europe's second listed utility by installed capacity. It produces, distributes and sells electricity and gas across Europe, North and Latin America. Further to the acquisition of the Spanish utility Endesa, together with partner Acciona, Enel has now a presence in 22 countries with approximately 83,000 MW of generating capacity (on 30th September 2008) and serves more than 52 million power and gas customers. Enel is also the second-largest Italian operator in the natural gas market, with approximately 2.6 million customers and a 10% market share in terms of volumes.

Enel was initially established as a state owned monopoly in 1962. It became a private corporation in 1992. It has been listed on the Milan stock exchange since 1999 and Enel has the largest number of shareholders of any Italian company, at some 1.4 million retail and institutional investors in 2008.

Of the 83,000 MW of generating capacity, approximately 30,000 MW or 36% is in plants using renewable energy resources (hydro, geothermal, wind and solar), the vast majority of which is hydropower. The balance comes from thermal plants powered by oil, gas and coal, and some nuclear powered plants. Table 3.1 sets out the thermal capacity of generation by source.

Table 3.1: Generation Capacity in MW by Source

	2003	2004	2005	2006	2007
Thermal	29,043	29,161	29,226	27,472	40,003
Nuclear	-	-	-	-	2,441
Hydro	15,441	15,491	15,573	17,199	27,122
Geothermal	666	642	671	671	678
Wind	344	605	666	699	1,902
Solar (photovoltaic)	4	4	4	4	5

As can be seen Enel's generating capacity increased significantly in 2007 mainly due to international investments.

3.3 Key climate change policy drivers for change so far

The main drivers for change are the EU Emissions Trading Scheme (ETS) and the EU Renewables Directive. A further potential driver is the availability of state aid:

- The EU ETS has already affected its thermal fossil fuel increasing the opportunity costs of emitting CO₂ emissions. As increased compulsory auctioning is introduced this will have an increased impact on the costs of its fossil fuel power production.
- The Renewables Directive target for 20% of final consumption of energy to be sourced from renewable energy provides a strong driver for the development of renewable energy. It will also drive the promotion of energy efficiency.
- Currently there are no subsidies in Italy for renewable energy produced by large companies which is an important issue as generally renewable energy is more costly than its fossil fuel equivalent. Enel are currently seeking clarification at the EU level as to what financing mechanisms are allowed under state aid rules.

As the drivers tend to be regulatory, there are significant regulatory risks in terms of how these mechanisms, particularly the EU ETS, develop and the targets that they have. There are also risks arising from the need for electricity transmission networks to adapt to link in to renewable energy plants. Climate change will also be likely to impact on Enel's hydropower production capacity as water supplies are affected. Enel though see climate change generally as an opportunity for their company to improve its competitive position.

Overall, Enel sees climate change drivers as less significant than competition and globalisation drivers.

3.4 What has the company been doing so far?

Enel's strategy to combat climate change has six elements:

1. investing in the best available technologies for thermal generation (e.g. low-CO₂, high-efficiency coal-fired power plants and combined-cycle gas-fired power plants);
2. developing renewables in and outside Italy (planned investments in the next five years: a little less than 7 billion euro);
3. increasing energy efficiency in power plants and grids (if the electricity from their thermal power plants in Italy in 2007 had been generated with the 1990 heat rate, then CO₂ emissions would have exceeded actual ones by over 3 million tonnes, owing to an increase in the consumption of fuel of about one million tonnes of oil-equivalent);

4. increasing energy efficiency in end-uses (customers) saved about 384,000 tonnes of oil-equivalent of fuel and avoided 1.2 tonnes of CO₂ emissions to the end of 2007;
5. researching into, developing and demonstrating CO₂ capture and sequestration and innovative renewable-energy technologies; and
6. globally committing to cut down CO₂ emissions by disseminating projects and best practices in eastern Europe and in developing countries, also under mechanisms such as the Kyoto Protocol Joint Implementation and Clean Development Mechanisms.

3.4.1 **Internal actions and measures**

Investing in Best Available Technology for Thermal Power

Enel has committed significant resources to cutting emissions in its fossil fuel based thermal plants. They have reduced emissions from 618 gCO₂/KWH of net total generation in 1990 to 496 gCO₂/KWH in 2007. This has mainly been achieved by investment in more efficient power stations such as gas combined cycle power stations.

In Italy in the year 2000, Enel had already entered into a voluntary agreement with the Ministry for the Environment and the company committed itself to reduce CO₂ specific total net emission of approximately 20% by 2006 (down to 510 grCO₂/kWh). Enel has in fact over performed compared to the target, since their specific emissions in Italy were only 496 grCO₂/kWh in 2006. Even though the agreement officially expired in 2007, Enel is still committed to the goal of reducing and maintaining the reduction achieved for CO₂ specific emissions. In fact in the 2007 the registered specific emissions have been: 496 grCO₂/kWh.

Currently, Enel is modifying its power stations to improve both efficiency and energy security by reducing the use of fuel oil, using gas in combined-cycle gas turbines (CCGT) and increasing the use of clean coal in new plants which are very efficient in terms of both fuel and environment. For instance, the conversion of Civitavecchia power plant is already done and Porto Tolle has now received the authorization needed.

ENEL's plans for fuel mix up to 2015 are: 50% clean coal; 20% CCGTs; 30% Renewables, since the nuclear option is not available in short terms. Hence, as far as Italy is concerned, it is important to stress that the Italian power sector will necessarily have to continue relying heavily on fossil fuels.

Investing in Renewables

Enel have a 5 year programme from 2007 worth €6.8 billion to develop and build new renewable-energy power installations. By the end of 2007 they had new power installations totalling 33 MW in Italy and 169 MW outside Italy in service. Additionally Enel acquired 600 MW of in-service power installations as well as projects under development:

- Enel has been active in **wind power** building new facilities in Italy in 2007 leading to a total installed capacity of 315 MW. It has also acquired projects and facilities internationally – France (58 MW to be built); Romania (200 MW to be built); and Greece (127 MW both in service and to be built). It has also entered into agreements for building new wind farms in the US and Canada.
- Enel sees themselves as global leaders in **geothermal** generation. In 2007 they entered the US market acquiring one in service plant and four projects at an advanced state of completion (150 MW total). In El Salvador, they have just completed construction a plant with a capacity of 44 MW.
- 4 **hydropower** plants went into operation in 2007. Enel have also invested in hydropower in Panama (300 MW) and Mexico (59 MW).

- Enel began a programme to install **solar photovoltaic** facilities on the substations of its distribution grid. The first MW has already been installed on 50 substations in 2007.

In 2009 Enel reorganised its operations creating Enel Green Power under which all the renewable energy is operated and branded. This was done to increase the profile and focus on renewable energy generation.

Innovation

Enel are investing €600 million over 5 years from 2007 in innovative projects in the following three areas: zero-emission thermal power plants; diversification and deployment of new renewable-energy technologies; development of distributed generation and end-use energy efficiency:

- Enel is investigating the most promising techniques of CO₂ capture and sequestration (see box 1.1) and developing the first ever power plant powered by hydrogen.

Box 1.1: Carbon Capture and Sequestration Technologies being investigated

post-combustion CO₂ capture, through which carbon dioxide is separated from flue gases from fossil-fired power plants. Within 2012, Enel plans to build a demonstration facility with geological storage of carbon dioxide, which will be one of the most innovative European installations for CO₂ capture. In 2007, experimental tests were conducted in a laboratory facility. A pilot installation, whose design is at an advanced stage and to be built in Brindisi, will precede the construction of the demonstration facility;

combustion in oxygen, which replaces combustion in air with combustion in pure oxygen and which permits to obtain a concentrated flow of CO₂, ready to be sequestered, at the power plant stack. In 2007, tests were initiated on this innovative technique jointly with the ITEA company and the research center of ENEA (Italian national agency for new technologies, energy and the environment) in an experimental facility located in Gioia del Colle; a pilot installation and, subsequently, an industrial-scale demonstration facility are expected to be built in Brindisi;

coal gasification, through which CO₂ is separated before combustion, thereby obtaining hydrogen for thermal power generation. Enel is making arrangements to participate in major European and international gasification and CO₂ sequestration initiatives.

- Enel is developing innovative projects aimed at overcoming the barriers to the use of renewable technologies (e.g. reduction of costs, low efficiency of commercially available systems and storage of electricity to ensure continuity of supply). Enel has undertaken a range of projects to bridge the gap between research and industrial application. Significant initiatives include:
 - The 'Archimedes' project developing a thermodynamic high efficiency 5MW power plant with an innovative system of energy storage;
 - The Advanced Solar Laboratory at Passo Martino to be a center of excellence at national and international level for the study and characterisation of the most advanced photovoltaic components and systems; and
 - The Innovative Geothermal Generation project aimed at exploring the exploitation of still untapped water-dominated low-enthalpy geothermal fields for future geothermal power generation.
- Enel is exploring the development of transmission grids that are able to work with distributed electricity generation so that customers are both users and generators of electricity. Significant initiatives include:

- Enel is working with 'Green Islands'³ to feed them green energy and gradually move them to being energy self-sufficient; and
- Enel is developing 'smart grids' that balance and manage electricity flows at a local level, while maximising security and quality of supply.
- More recently, Enel has been exploring the potential and implications of the development of electronic vehicles:
 - Enel is participating in an EU study exploring the implications of a significant increase in the use of electric vehicles for the operation of European electricity transmission grids;
 - It is currently examining the efficiency of its vehicle fleet and exploring a move to hybrid and electrical vehicles; and
 - It is involved in a study with Daimler Mercedes Benz testing electronic vehicles in Rome, Pizza and Milan, with 100 vehicle users in each city.

3.4.2 External actions and measures

Enel has worked extensively with its customers to promote energy efficiency:

- It was the first utility in the world to fit new electronic electricity meters which could be monitored in real time allowing different charging rates at different times encouraging the use of electricity when demand was low; and
- It has been engaged in energy-saving awareness campaigns including distributing 17 million low-consumption lamps and 4 million water flow reducers in 2007.

Enel is involved in a range of activities where climate change policies are shaped. This activity translates into participation in initiatives such as those of IETA (International Emission Trading Association); e8 (international organization promoting sustainable energy development composed of 9 leading electricity companies from the G8 countries); and Climate Action Programme (promoted by Carbon Trust, Ceres, FTSE4Good, Investor Network on Climate Risk, Pew Center on Global Climate Change), having the purpose of promoting dialogue between Governments and national industries, sharing the best practices and raising awareness of the opportunities that market mechanisms may offer and of the responses that they may give to the challenge of climate change. Further to these, Enel is particularly involved in:

- The Combat Climate Change initiative⁴ involving 49 companies promoting the integration of climate issues into the world's market and business mechanisms; and
- Eurelectric (Union of the Electricity Industry in Europe), where Enel's CEO as vice-president of Eurelectric was instrumental in promoting a declaration aiming for zero carbon power generation by 2050.

Enel ranks among the top players in the global market for emission certificates. Over a period it has scouted for project opportunities globally under the Clean Development Mechanism and Joint Implementation system. It has worked to develop and implement the projects and to verify their avoided emissions and the related issuing of CO2 credits. It has also invested in carbon funds to diversify the risk associated with its project implementation.

As to the portfolio of greenhouse gas abatement projects that Enel has created so far, the expected emission reductions would equal to 75 Mt of CO2-equivalent for the period 2008-2012. Enel's portfolio comprises more than 60 projects concerning fugitive emissions of hydrofluorocarbons and wind and mini-hydro installations. 10 of these projects have

³ These are Italian islands that are seeking to reduce their environmental impacts.

⁴ See http://www.combatclimatechange.org/www/ccc_org/ccc_org/224546home/index.jsp

completed the approval process and have already been implemented; they will generate 73% of the expected volume of avoided emissions.

3.5 Impact on company performance

Enel doesn't consider that climate change drivers have had a significant impact to date on sales or profits. Much of the current investment in renewables is also significantly driven by security of supply considerations.

3.6 Impact on jobs and skills

3.6.1 Impact on jobs

Enel weren't able to quantify the jobs specifically arising from climate change policy drivers. However jobs associated with their renewables and innovation operations as at 28 February 2009 are as follows:

- 1,584 in Enel Green Power (36 Executives; 135 Middle management; 716 white collar; 697 blue collar)
- 1,033 in the Enel Engineering and Innovation Division (43 executives; 410 middle management; 566 white collar; 14 blue collar)

3.6.2 Impact on skills

Enel saw the following impacts on skills, which were likely to become increasingly significant over the future:

- Skills in marketing energy efficiency and behaviour change;
- Expertise in nuclear power plants;
- Engineering expertise involved in the development of the various renewable technologies; and
- Risk assessment analysis, for instance associated with the complexities of sequestering carbon.

3.7 Future implications of climate policy drivers

Enel sees the main further direction one of increasing strengthening of the current regulatory drivers of the EU ETS and Renewables Directive. Enel's see their likely response as follows:

- Collaborating with other companies to gain relevant skills. For instance, they have recently entered into an MOU with EDF to collaborate on the development of nuclear energy in Italy allowing them to benefit from EDF's expertise.
- Increasing need for new skills and retraining such as how to encourage behaviour change towards more energy efficiency.
- Developing a synergistic renewables portfolio seeking low cost renewables where there is greater certainty of regulatory environment and funding availability.

Enel weren't clear as to what the job implications might be of these directions.

3.8 Lessons for other companies and sectors

A key lesson for Enel has been the need to engage with the EU policy making process at an early a stage as possible. Other lessons include:

- Having a multi-pronged approach for complying with climate change. Enel has been working on changing its input mix, increasing energy efficiency in production, transmission grids and end-uses, and off-setting emissions.

- Investing all over the world through CDMs for example, as greater CO₂ reductions can be achieved for a given amount of investment. Since climate change is a global phenomenon, it does not matter the CO₂ emission reduction are being achieved.

4 CASE STUDY 2: STATKRAFT

4.1 Summary

Statkraft is a large power company dominated by its production of hydropower from its history of exploiting Scandinavian hydropower although recently it has diversified into other forms of renewables and into gas fired power, which makes up 15% of its generation capacity.

Statkraft's climate change response has been mainly driven by the EU ETS and EU renewable policy culminating in the Renewables Directive.

These climate change drivers have allowed it to maintain their concentration on renewables rather than significantly diversifying into fossil fuel based power and has lead it to invest and develop a wide range of renewable energy technologies. Their major new investments have been in hydropower, wind and solar energy, while it is researching tidal and osmotic power.

Statkraft has been a pioneer trader in carbon allowances developing a standalone trading business.

It has also been active in seeking to influence EU policy, promoting a harmonised support mechanism that ensures funding supports the most efficient use of renewable resources; an open and interconnected energy market; and non-discrimination against gas fired power plants within the EU ETS. It is also promoting a global market in carbon.

Overall climate change drivers have benefited Statkraft company performance due to increased energy prices and profits from their trading business.

To date climate change drivers have not had a significant impact on jobs within Statkraft, but are likely to have had a significant impact outside Statkraft in companies that build new power plants and through second order effects of new power sources making economic growth possible particularly outside Europe. However Statkraft have not been able to estimate these impacts although they are considering studying them.

There has been a greater impact on skills through their involvement in research and development of new technologies and their investment in different countries requiring new knowledge of business operating environments. It doesn't see any of their current skill base being made redundant.

Statkraft sees future climate change policy drivers only strengthening their current strategic direction although the economic downturn has affected their current ability to invest as energy prices fall and financial uncertainty dominates. Statkraft sees future increasing opportunities for their current business strategy as the US becomes more active in climate change policy and work to develop a stronger international response. It does not see a great change in the job and skills impacts, although clearly increasing investments will continue to drive jobs inside and outside Statkraft.

Statkraft considers that other could learn from its concentration on the opportunities from climate change through developing niches where it can add value, while allowing bottom-up initiatives.

4.2 Introduction

Statkraft is a limited company owned by the Norwegian government and the 13th largest European power generation company. It currently has close to 3,000 employees and had a turnover of about €3 billion in 2008. Its history is inextricably linked to the development of hydropower generation in Norway. Though Statkraft was not established as an independent enterprise until 1992, its power plants and business operations date as far

back as the end of the 19th century, when the power of the country's waterfalls was first harnessed.

The bulk of Statkraft's production, an installed capacity of about 15,000 MW, is based on hydropower. Statkraft operates 143 hydropower plants in Norway, 58 in Sweden, 11 in Germany, 4 in Finland and 1 in UK. It also has 6 district heating plants and 3 wind farms. More recently Statkraft has started investing in gas-fired power plants, particularly 4 in Germany. Overall it has about 85% of its current generating capacity in renewables and 15% in gas-fired power.

It is also investing in other renewable energy sources:

- It is in the process of developing and testing a tidal power plant based on a floating, anchored steel structure which will generate electricity via four large turbines driven by marine currents.
- It has so far established a partnership with Norsk Solkraft in Italy to develop two solar power plants, each of 3.3 MW.

Statkraft also seeks opportunities outside Europe, based on the long experience and knowledge of renewables and open energy markets. Statkraft owns 60% of SN Power, which invests in and develop hydropower in South-America and Asia. The company is today present in Chile, Peru, Brasil, India, Nepal and The Philippines.

4.3 Key climate change policy drivers for change so far

The main drivers for change are the EU Emissions Trading Scheme (ETS) and the EU Renewables Directive. The Kyoto protocol has also been a less crucial driver, mainly impacting on the potential for international investments in hydropower.

The main impact of the EU ETS is to increase the value of hydropower generated electricity as it has pushed up the price of electricity without changing the cost of hydropower generated electricity as it is zero carbon energy. It has also exposed the limited gas powered generation to the price of emission allowances. Finally it has allowed Statkraft to develop a separate business trading in emission allowances.

The EU Renewables Directive should provide a significant opportunity to sell 'green certificates' based on Statkraft's renewable generating capacity. This highlights the importance of renewables for the future of European energy and has driven Statkraft's investment strategy.

As the main drivers are regulatory, this does mean that there are significant regulatory risks given the long-term nature of investment in generating capacity. For instance, Germany recently reduced its targets for wind power capacity. There are also medium term uncertainties round the development of the EUETS and Renewables Directive.

4.4 What has the company been doing so far?

Overall climate change policy drivers have confirmed, strengthened and speeded up the Company's business strategy, rather than significantly altering its direction. The Company's strategy has been to concentrate on development of renewables and other environmentally-friendly generation such as gas power. This has led to some investment in state of the art gas fired power stations to provide extra growth, which could be limited by restricting development to renewable energy. Climate change drivers have allowed them to maintain their strategy to retain their strong concentration on renewable energy planning to maintain their 85% balance of renewable energy.

Statkraft's emissions of CO₂ are mainly from its gas fired power plants and district heating systems, as summarised in Table 4.1. The percentage of heat generation in district heating systems based on waste is between 70% and 80%. This means that around 120,000 tonnes of waste is converted to heat in the Group's plants. Other emissions of greenhouse

gases stem from transport from the Group's own vehicle fleet and the accidental discharge of halon and SF6.

From 2008 the Group has purchased climate quotas in the voluntary carbon quota market for greenhouse gas emissions resulting from transport and environmental non-compliances.

Table 4.1: Statkraft CO2 emissions

CO ₂ -EQUIVALENTS				
	UNIT	2007	2006	2005
CO ₂ -equivalents	Tonnes	292 000	150 900	134 100
Of which CO ₂ from gas power	Tonnes	229 900	-	-
Of which CO ₂ from district heating plants*	Tonnes	55 700	137 500	128 000
Of which CO ₂ -equiv. from SF ₆ emissions	Tonnes	1 500	9 600	1 400
Of which CO ₂ -equiv. from halon emissions	Tonnes	2 100	-	700
Of which CO ₂ from fuel consumption**	Tonnes	2 800	3 800	4 000

* For 2007 only CO₂-emissions from non-renewable fuel has been included, for 2005–2006 both renewable and non-renewable fuel has been included.

** CO₂ from fuel consumption from the Group's own equipment and machinery.

4.4.1 Internal actions and measures

The main internal responses have been the investment in hydro, wind and solar power, and research in tidal and osmotic power. Statkraft is also planning to continue to invest in hydropower particularly in SE Europe including Turkey and internationally, where there continues to be significant potential for the development of hydropower.

Statkraft have developed **wind power** investments over the last 7 years and now have 3 wind farms as well as a range of projects in the pipeline awaiting licensing. Statkraft sees considerable potential for the construction of wind power facilities in Europe, particularly in coastal areas and offshore. The best available wind resources are found in Norway and the UK and the company has recently invested in a major offshore development in the UK as well as being active in the 3rd concession round in the UK on offshore wind (Forewind). In a 10–15 year perspective, they consider that wind power generation in Norway could be expanded to an estimated 10–15 TWh.

They are also now looking to invest in **solar energy**. They are seeking to establish themselves as strong players in what they see as the early stage of development of the solar industry. The main elements in Statkraft's approach to solar energy are as follows:

- focus on centralised solar systems initially;
- geographical focus on Italy, Iberia and Southeast Europe; and
- participation in the entire downstream value chain, with a main focus on securing land and projects in an early phase.

In this phase their main task has been to establish partnerships that can secure access to appropriate land areas and have projects considered for licenses. At the same time Statkraft will continuously assess potential strategic partners to secure market access, consider participation in other parts of the value chain and secure access to new technology.

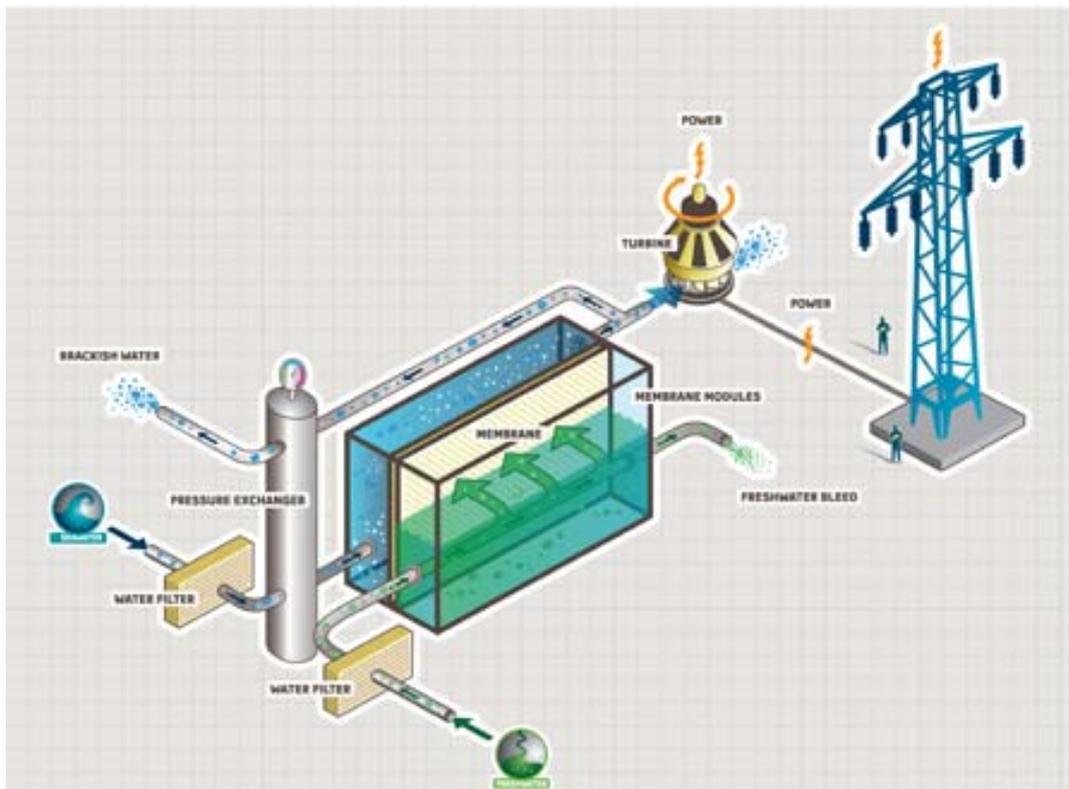
Statkraft has so far established a partnership with Norsk Solkraft in Italy to develop two solar power plants, each of 3.3 MW. One of the power plants has already been granted a

licence. In addition, Statkraft owns 70 per cent of the Spanish development company Renewable Energies & Photovoltaics Spain SL (REPS). The company is currently working on four different projects in Spain with the goal of acquiring its first licence in the spring of 2009. Statkraft also sees opportunities in technology development as regards solar energy and is currently involved in the solar sector through investments in the venture fund Energy Future Invest (EFI). The fund assesses seed companies that develop solar energy technology.

Statkraft is funding R&D in **Ocean Energy**, which includes offshore wind, tidal and wave energy. They have set up a joint research programme as a joint initiative with three Scandinavian universities: Norwegian University of Science and Technology, Uppsala University and Technical University of Denmark. The program includes approx 30 scientific positions (PhDs, senior researchers and one professor) and initiatives to engage students into offshore renewable energy.

They are also funding R&D in **Osmotic Energy**. When freshwater meets saltwater, for example where a river flows out into the sea, enormous quantities of energy are released. This energy can be utilised to generate power through the natural phenomenon of osmosis. Osmotic power plants (as illustrated in Figure 4.1) utilise the osmotic pressure difference between seawater and freshwater to drive a turbine, which in turn generates electricity.

Figure 4.1: Illustration of an Osmotic Power Plant



Although there has been no significant change in the core business, **carbon prices** have become a much greater factor in decision making. This has also led to actions to build capacity in the company to understand carbon prices.

In general actions have focussed on electricity generation as the core means to a low carbon future. However Statkraft has committed to **reduce its flights** by 20% mainly through investment in video conferencing facilities. The details of the timeline for implementing this have yet to be determined.

4.4.2 External actions and measures

Statkraft is a **pioneer trader** in 'green energy' products such as Guarantees of Origin, Renewable Energy Certificates (RECS) and CO2 quotas. This trading has developed as effectively a standalone business taking advantage of the general increase in trading relating to energy and climate change policy.

Statkraft has also been active in **lobbying and influencing** in a number of areas:

- They have been active in promoting a harmonised European support scheme for renewables that matches renewable resources with funding so that renewable energy is developed as efficiently as possible for Europe. Currently renewable energy is developed where support schemes are available that does not necessarily match the availability of renewable resources.
- They have been promoting increased European interconnectivity capacity for electricity so that different energy resources can be balanced out across Europe. So for instance the use of intermittent wind power in NE Europe can be balanced with base load capacity such as hydropower in other parts of Europe.
- They have sought to ensure that new gas fired power stations are not discriminated against within the EU ETS. For instance in Germany, new coal fired power stations received twice the allowances as equivalent gas fired power stations per Kwh electricity produced, in the NAP 2 allocation round.
- Internationally they are promoting a global carbon market and international agreement post Kyoto.

4.5 Impact on company performance

To date Statkraft has definitely improved its company financial performance due to climate change policies. Its sales and profits from hydropower have improved due to the increase in price of electricity due to climate change drivers. It has also made profits from its trading activities.

4.6 Impact on jobs and skills

4.6.1 Impact on jobs

Impacts on jobs within Statkraft have been in 2 main areas:

- Statkraft now employs about 30 staff as analysts, business developers and traders related to climate change policy and renewable energy development; and
- They employ about 50 staff in their wind power team leading on investment in wind power.

These are gross jobs and not all the positions will necessarily be new but result from re-organisations and movements of staff.

However the main impacts on jobs from Statkraft activities are likely to be outside the company through:

- Jobs in constructing and managing new power capacity; and
- Jobs created by the availability of power in new areas.

They are unable to estimate the quantity of jobs involved, but have considered the possibility of commissioning a study to assess this, which they envisage as likely to methodologically challenging.

4.6.2 Impact on skills

Skills have increased in Statkraft from a range of factors driven by climate change policy drivers:

- They have had to increase their investment in R&D and their involvement in the development of technology and use of developing technology. This has all fed into increased skills with the company.
- Investment in a broader range of renewable energy has required diversification overseas. For instance solar energy capacity is planned to be concentrated in southern Europe. This has required a much broader geographic perspective and understanding of the business operating environment in different countries including the corporate social responsibility requirements. Traditionally Statkraft has been focused on Scandinavia.
- Investment internationally has also built and demanded increased investment and project management skills.

Currently there is no perception that any previous skills are redundant as Statkraft is not discontinuing any of its traditional activities.

4.7 Future implications of climate policy drivers

Overall future climate policy drivers are likely to strengthen the current direction rather than change it. However, currently, other factors outside climate change policy are having a significant impact on policy. The current economic downturn has significantly reduced current and forward energy prices and the value of CO2 allowances. It has also created a level of uncertainty over investments. Beyond this, the openness of energy markets in Europe, the interconnectivity and grid capacity, are key factors for future investment decisions.

4.7.1 *Increased stringency of existing climate change policy drivers*

Statkraft is likely to continue with its current direction as current policy drivers become increasingly stringent. This should benefit further its drive to invest in renewable technologies and allow increased growth in wind and hydropower. This will increase the number of projects it is involved with and demand increased project development skills. It may also increase demand for specialists in renewable energy technologies.

4.7.2 *Implications of new climate change policy drivers*

Statkraft sees potential new policy drivers coming from the US's engagement with climate change which could also potentially lead to a stronger post-Kyoto settlement. They see this as potentially boosting investment in renewable energy in the US and internationally particularly increasing growth in wind and hydropower where Statkraft is internationally competitive. Potentially this will further boost demand for international skills and specialist employees.

They also see the potential for increased trading in carbon allowances emerging from the post-Kyoto settlement, potentially through a strengthened CDM mechanism. Their experience and expertise gained in trading in Europe could then be exploited in these new market opportunities.

4.8 Lessons for other companies and sectors

Statkraft considers that other companies could learn the following lessons from their experience:

- they should look for the opportunities arising from climate change policy;
- They should then focus on their niche areas where they can add most value; and
- They should allow bottom-up initiatives especially in the identification of opportunities for CO2 savings.

5 CASE STUDY 3: SWM

5.1 Summary

SWM is a multi-utility company owned by Munich City Municipality in Germany supplying energy, water and transportation services. Its power supply is dominated by combined heat and power plants producing 80% of its power, while a range of renewables provide 4.3% of total power production.

SWM is driven by a range of climate change policies and regulations. These include the EU ETS and Renewables Directive as well as available subsidies in Germany and the policy priorities of the Munich City Municipality. Although SWM faces regulatory risks, overall they see climate change as an opportunity and an equal driver with competition and globalisation.

SWM has focussed on increasing its renewable energy supply with a target to achieve 20% renewable power supply by 2020 from its current low base and a vision of moving to 100% renewable energy for its Munich customers although this does not have a timeline. It has increased its capacity to make investment decisions in renewable energy and is looking at investment opportunities outside Munich and its environments in order to access renewable resources.

SWM have engaged externally with the Brussels policy making process, its customers and renewable energy associations.

Overall SWM considers that climate change has had a positive impact on its performance as profits from investments in renewables and its environmental image outweigh any negative factors such as increased energy efficiency reducing demand for its product.

SWM has not significantly increased its workforce as a result of climate change although there may be employment benefits arising from its investments in renewables outside SWM, but it is not possible to estimate these.

The main new skills required are understanding and knowledge of business operating environments in other countries in order to decide on investments in renewables.

SWM do not see major changes in its broad strategy as climate change drivers change over the future.

SWM sees a variety of lessons in its experience for other sectors in particular in terms of building its capacity gradually to understand the technical and policy issues in renewable energy investment.

5.2 Introduction

SWM is a multi-utility company owned by Munich City Municipality in Germany and citizen value is a central theme for SWM. It employs more than 7 thousand employees and has a turnover of about €4.7 billion. It provides a range of utility services to approximately 1.1 million customers:

- Energy services: electricity, district heating and natural gas supplies;
- Water supply services and 18 municipal swimming pools; and
- Local transportation: subway, bus and tram services.

80% of its power is produced by combined heat and power (CHP) plants, while 350 million kWh/year (4.3% of the total power production) is produced from renewable sources including nine hydroelectric power plants, one wind power plant, various solar plants and one geothermal power plant.

5.3 Key climate change policy drivers for change so far

SWM are faced with a wide range of drivers:

- The EU Renewable Energy Directive with its 20% renewable energy target by 2020 is a key driver.
- The EU Emissions Trading System (ETS) has increased the costs of fossil fuel production driving the company further towards renewables.
- As the company is owned by the City of Munich it is subject to the political position of the City which is promoting action to address climate change. Munich has signed up to the Convention of Mayors with a 20% target for CO2 reduction.
- Germany's feed-in-tariff with its guaranteed price for electricity reduces the risks and costs of investing in renewable energy.
- There is a support schemes for renewable heat supplies as new buildings are obliged to have it unless there is a district Combined Heat and Power (CHP) scheme.
- There are low interest loans for the thermal energy systems.

SWM see a reputational risk from being perceived as a CO2 polluter, but also an opportunity as SWM with 80% of its power produced by CHP is well placed to produce relatively carbon efficient energy. However CHP is somewhat disadvantaged by the EU ETS compared to other household heating as it is covered by the EU ETS while small household boilers are not.

SWM see risks from the current economic depression as it is likely to put downwards pressure on electricity prices and support schemes. It has also made it more difficult to get finance for investments in renewables.

SWM also consider the following factors as potentially significant:

- As demand for renewables increases this is likely to increase the prices and create bottlenecks in delivery given the limited global capacity to supply renewable technology (e.g. wind turbines).
- As buildings become more energy efficient (e.g. due to insulation), this could potentially lead to reduced demands for energy.
- There is increasing demand for district heating as preferred to other forms.
- There is a potential for increased demand for electricity in the case that electric cars become more popular.

Overall SWM considers that climate change has been an equally important driver with increasing competition driven by liberalisation of the energy market.

5.4 What has the company been doing so far?

SWM has focussed on managing its carbon emissions from energy production, rather than its overall carbon emissions. This it has mainly done by investing in renewables and CHP. To support this direction it has established a new strategic unit covering climate change and renewables as well as competition issues. It has also established a policy department. Together these units support it making the challenging decisions on investments in energy production that could last 30-40 years.

5.4.1 Internal actions and measures

SWM has established a target of achieving 20% of its power production from renewables by 2020, which is a challenging target given its current 4.3% renewables production. The company's vision is to achieve 100% renewable power supply to its Munich customers although no date has been set yet to achieve this by. It is examining a whole range of technologies with support from specialists in its strategic unit:

- In and near Munich: hydro power, biomass, biogas, biofuel, geothermal and solar power; and
- Outside Munich and its region: onshore and offshore wind, solar and tidal power.

SWM has concluded that it has to invest outside its region in order to meet its renewable target. It is currently looking at investing in different European countries.

SWM has already invested in a range of innovative renewable energy schemes:

- It is constructing a geothermal power plant with the capacity of 8 MW (electrical power), which will also provide huge parts of the city of Sauerlach with heat through the CHP system. In comparison with heat production by oil and power production by coal power plant, it will save over 35,000 tonnes of CO₂ per year.
- It is using groundwater to cool the BMW research centre. This will save 10 million kWh/year, enough power for 3,000 households.
- It has installed a Biogas power plant at the Munich Zoo which is fed with dung, sewage and feed residue. It produces 240,000 kWh/year of heat and 230,000 kWh/year of heat.

5.4.2 External actions and measures

SWM now has an office in Brussels in order to be able to monitor more closely policy developments in the EU and engage with the policy making process. It also makes presentations to relevant conferences to promote its activities in addressing climate change and promoting the innovative use of renewable energy.

It advertises its environmentally related activities to its customers who are also citizens of Munich and hence influence its owner, the Munich City government.

SWM developed a special higher tariff for 100% renewable electricity but had a very low take-up.

SWM collaborates extensively with various EU Energy Associations. This allows it to keep informed of the latest technological developments and also identify potential joint venture opportunities with other companies with greater experience of particular technologies. For instance it has invested in off shore wind as part of a consortium providing 25% of the investment in 80 wind turbines, sharing experience and risks.

5.5 Impact on company performance

SWM is convinced that the impact of climate change policy on its company performance is positive. However, there are a number of different factors that it sees as having both positive and negative effects:

- Energy efficiency could reduce demand for energy and hence reduce profits;
- Investments in renewables are generally profitable and hence increase profits;
- Its environmental credentials responding to climate change should position it well in competing in the new liberalised markets and hence increase profits; and
- The unfair competition between district heating systems, covered by the EU ETS, and household boilers, not covered by the EU ETS, might reduce profits.

5.6 Impact on jobs and skills

5.6.1 Impact on jobs

SWM have hired about 10 specialists (out of a workforce of 7,400) in renewable energy and climate change strategies to provide advice on investments in renewable energy. Recruitment of such specialists is highly competitive as there is a high demand for their skills.

There is likely to be increased indirect employment arising from SWM investments in renewable energy, but this would be in companies that supply and construct the renewable energy plants, not in SWM and they are not able to estimate the extent of these employment impacts.

5.6.2 Impact on skills

There is a need to ensure that knowledge of renewable energy sources is kept up to date as it is continuously changing and developing. Company specialists in different types of technologies give monthly presentations on the latest developments.

There is a substantial need for increased skills in languages and knowledge of different countries. This is driven by the need to internationalise the production of power particularly to access wind and tidal power. SWM have carried out extensive training in languages and the business environment in different countries.

There is no redundancy in skills as there is still a need for skills and knowledge in conventional plants. There is now a greater variety of skills required.

5.7 Future implications of climate policy drivers

SWM have a vision to achieve 100% renewable energy supply to its Munich customers by a date yet to be specified. The planning process for letting this vision to become reality has already started. Elements discussed so far include:

- Increased use of biomass in CHP;
- Investments in renewable energy power plants;
- Purchasing of renewable energy certificates; and
- Selling the remaining quantity of fossil fuel produced energy outside Munich.

Overall, though, SWM does not see a substantial change to its current strategy of substantially increasing investment in renewable energy due to increased stringency or changes in climate policy drivers.

5.8 Lessons for other companies and sectors

SWM sees the following as lessons that may be applicable to other companies and sectors:

- It is worth taking time to change your strategic direction, taking several small steps, and developing skills and knowledge. It is important that this process involves challenge and discussion to ensure the right direction is taken.
- There are potential benefits from being a multi-utility through identifying synergies between different utilities. For instance using ground water to cool buildings and powering public transport systems with renewable energy.
- Ensure you have the right expertise and technical knowledge either through hiring specialists or going into partnerships with other businesses.
- Take a close interest and involvement in relevant policy development at the EU and national level for instance through having a Brussels office.

6 CASE STUDY 4: HOLCIM

6.1 Summary

Holcim is one of the largest cement producers in the world and has taken a proactive stance to tackle climate change. It recognises that climate change and energy security are global challenges. Cement is a key requirement of modern society but its manufacture is a resource and energy-intensive process – accounting for 5% of global manmade CO₂ emissions. The EU ETS has been instrumental for action on CO₂ and as a means to use the power and flexibility of the market to achieve an environmental objective in the EU. Independent studies have shown that auctioning of allowances from 2013 could seriously undermine the competitiveness of the company unless it is based on benchmarking and fit within a global framework.

Holcim believes that innovation is key to reducing CO₂ emissions. The company has reduced CO₂ emissions by optimizing products and processes, and investing in research and development such as developing new types of cement and using alternative fuels, within the current technical limits. Holcim is investing in process and product optimization and is reducing its net CO₂ emissions per tonne cement on an ongoing basis. Holcim achieved a 16.3% reduction in net CO₂ emissions per tonne cement in 2007 from 1990 levels. The company is on track to achieve their target to reduce global average net specific CO₂ emissions by 20% by 2010, compared with 1990. The main ways by which Holcim is reducing CO₂ emissions if given below:

- Holcim is currently the market leader for material substitution, with around 27% of alternative materials, including gypsum, being used in its cement in 2006.
- It has also increased the use of alternative fuels in its kilns to 11% in 2007 compared to 4% in 1990. It has also phased out almost of all its inefficient wet kilns and most plants in Europe produce cement from dry kilns.
- Holcim works closely with architects and construction companies to develop new and innovative cement products with low carbon footprints both in the production and use phase.
- Holcim is working with a wide range of partners from all over the world to engage, inform and support their environmental strategy. Holcim initiated the World Business Council for Sustainable Development's member-led Cement Sustainability Initiative (CSI) in 1999 together with two industry colleagues to reduce the industry's carbon footprint. The CSI now represents more than half the worldwide cement industry outside of China.

Holcim's climate change and sustainability initiatives have had a positive impact on investor confidence. Improved share price performance generally reflects greater investor confidence. Investors increasingly demand CSR reporting and recognise that complying with climate change policy drivers has also helped the company to become more competitive. Though it is not possible to quantify the investments and the cost savings that are uniquely associated with CO₂ reduction measures.

The main impacts on jobs and skills of CO₂ reduction measures are:

- New jobs have been created at both the corporate and technical level. The corporate head office employs 6FTE people working on climate change issues such as engagement with policy makers, internal communication and sustainability management.
- Each of the 11 companies in Europe has at least one FTE person in charge of CO₂ compliance and management.

- Holcim's initiatives to reduce carbon emission by clinker substitution and alternative fuels would create direct and indirect jobs.
- All staff whether in financial, administration or technical are trained on monitoring and reporting of CO₂. This has greatly improved the understanding of how their role affects CO₂ performance and what they can do to improve it and at what cost.

6.2 Introduction

Founded in Switzerland in 1912, Holcim is one of the world's leading suppliers of cement, aggregates (crushed stone, sand and gravel), ready-mix concrete and asphalt. The company also offers consulting, research, trading, engineering and other services.

The group operates in over 75 countries worldwide. In 2008, Holcim recorded sales of over 25 billion Swiss francs. Europe accounted for 38.3% of total group sales. The company employs 90,000 people worldwide and 23,557 in Europe.

The company's key objective is creating value for its stakeholders. The company believes that by placing sustainable development at the core of its business strategy would enhance this value, safeguard reputation and contribute to continued success.

6.3 Key climate change policy drivers for change so far

Concrete is the second most used resource in the world after water in terms of weight (estimated 20 billion tonnes in 2007). Currently there is no practical substitute for this versatile and durable product for most purposes. As the chief ingredient in concrete, cement is therefore a key requirement of modern society but its manufacture is a resource and energy-intensive process – accounting for 5% of global manmade CO₂ emissions. These result primarily from the combustion of fossil fuels (40%) and the calcination of limestone (60%), a chemical reaction required to produce cement clinker. While CO₂ emissions per unit of cement or concrete is comparatively low in the building materials sector, per unit of financial added value it is high.

Holcim believes that the most effective way to reduce CO₂ emissions is via policy and regulated market instruments that set CO₂ and/or energy efficiency targets for companies, products and services, within worldwide international frameworks. In this respect the EU ETS and other market instruments such as Clean Development Mechanism (CDM) and Joint Implementation (JI) are very influential for driving the company to reduce CO₂ emissions.

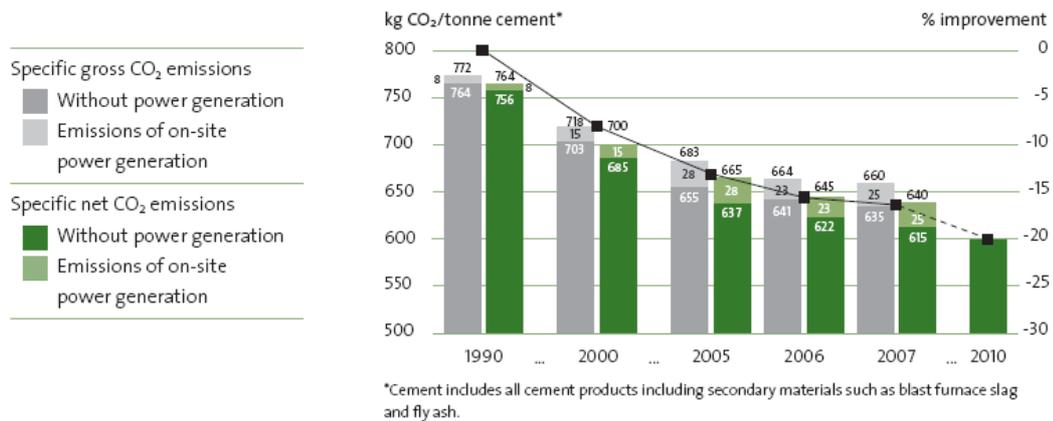
Indirectly new building standards and directives are also drivers for change. The new EU Building and Energy Efficiency Standards (eg. Energy Performance of Buildings Directive 2002/91/EC) and the EU Construction Products Directive (Council Directive 89/106/EEC) now stipulate higher environmental standards.

6.4 What has the company been doing so far?

Holcim has minimized and mitigated CO₂ emissions through a variety of approaches. Despite a 103% increase in global cement production between 1990 and 2007, Holcim's increase in absolute net CO₂ emissions was only 70%, due to improvements in energy and process efficiency, the growing amount of waste-derived fuel used in kilns and increasing use of mineral components.

By the end of 2007, Holcim achieved a 16.3% reduction in net CO₂ emissions per tonne cement (Figure 6.1) (2006: 15.6%). The company is on track to achieve their target to reduce global average net specific CO₂ emissions per tonne of cement by 20% by 2010, compared with 1990.

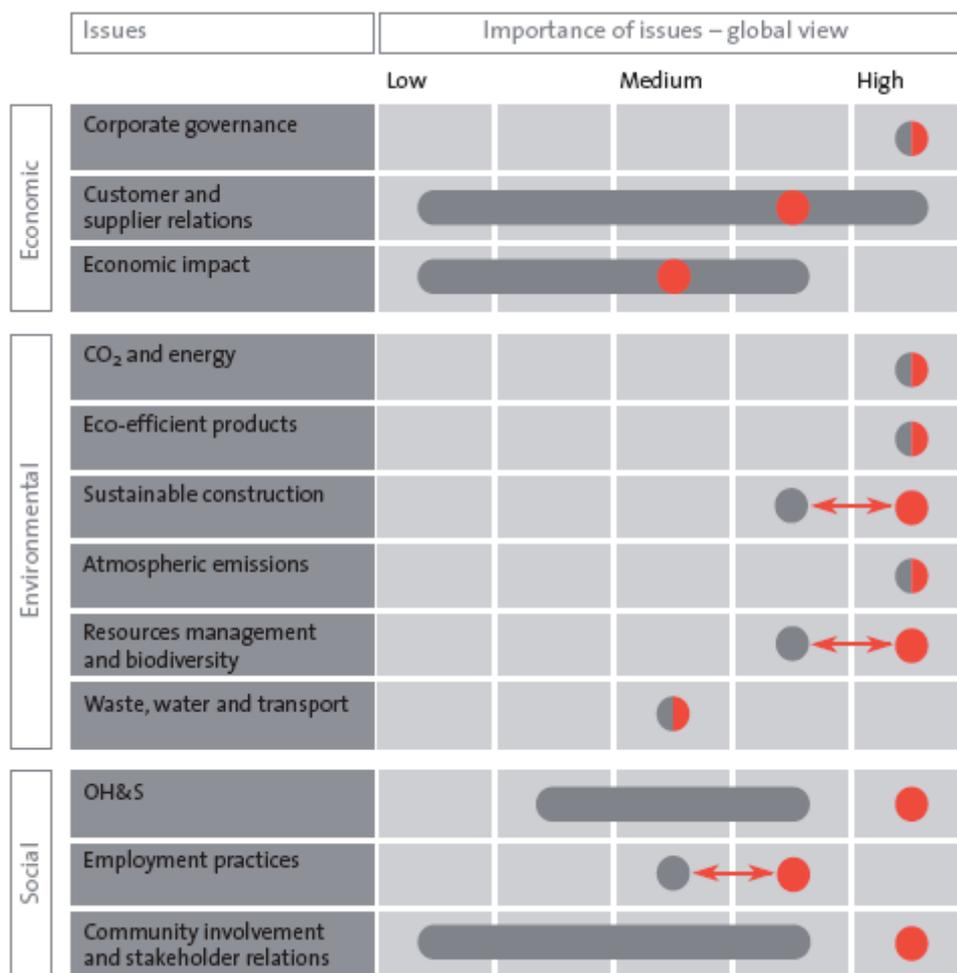
Figure 6.1: CO₂ Emissions per tonne of Cement



The company has a number of systems in place to monitor and report CO₂ and energy use, such as monthly management reporting. This enables them to identify CO₂ hot-spots for making cost-effective CO₂ abatement decisions. CO₂ and energy is now integrated in all aspects of the business. Ongoing investment to upgrade plant equipment as well as regular maintenance and training are required by an in-house emissions monitoring and reporting (EMR) standard. The company is aiming to implement this standard in kilns across all its plants. At the end of 2007 the implementation rate of the continuous emission monitors at kiln stacks (excluding India) was 83% (2006:83%).

To ensure that relevant sustainability risks and opportunities are integrated into the company's broader business risk management system Holcim started to implement a sustainable development (SD) materiality review (Figure 6.2). Identified SD issues are plotted on a materiality matrix to balance the expectations and concerns of their stakeholders, with the impact of these issues on the company.

Figure 6.2: SD materiality review – aligning global stakeholder feedback with current Group priorities



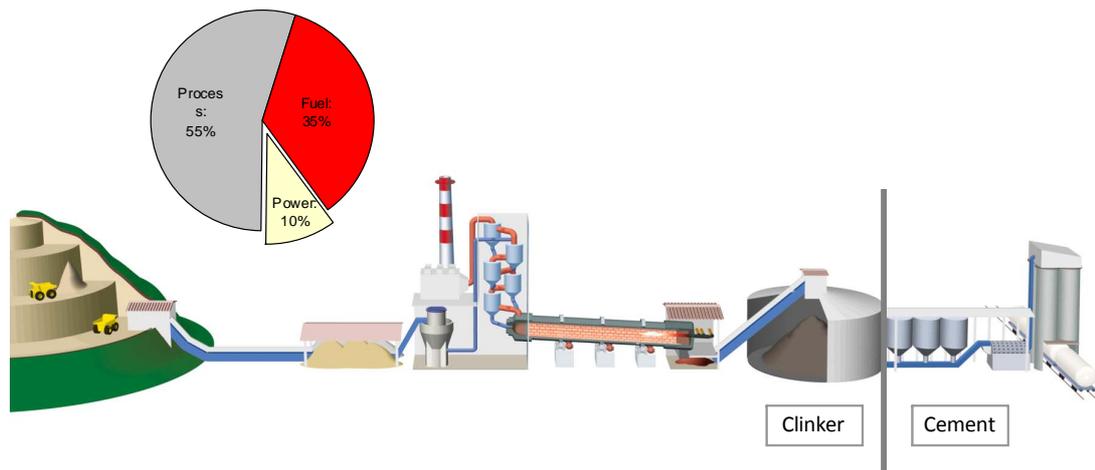
- Holcim view – result of Holcim business risk management process.
 - External stakeholder view – result of interviews with 16 external stakeholders including academics, government officials, NGOs, suppliers, analysts and customers at a global level.
 - View from Holcim and external stakeholders coincide.
 - Range of external stakeholder views.
 - ↔ Represents a clear difference between internal and external view.
- Low:** Low level of concern to stakeholders and low level of current impact on Holcim.
- High:** High level of concern to stakeholders and high level of current or potential impact on Holcim.

Source: Holcim

Cement production generates CO₂ emissions in 3 ways as shown in (Figure 6.3). Clinker is the main constituent of cement and it provides the strength of the finished product. However, the production of clinker is emissions-intensive, both in terms of the fuel necessary to heat the kilns, and the chemical process that converts calcium carbonate to clinker (releasing large amounts of CO₂, 55%). Process emissions are intrinsically linked to

the production process and cannot be reduced beyond certain levels determined by physical laws. There are several approaches to reducing the emissions associated with cement manufacture, but within Europe at least, two are key. The first involves reducing the amount of clinker in the finished cement, known as ‘clinker factor reduction’ or material substitution. The second method of emissions reduction is by using alternative fuels, including organic waste, animal feed and biomass. The emissions saving results from the fact that these fuels are considered “carbon neutral” – on a net basis over their lifecycle, they do not release CO₂. These are discussed in more detail in the next section.

Figure 6.3: CO₂ Emission from Cement Production



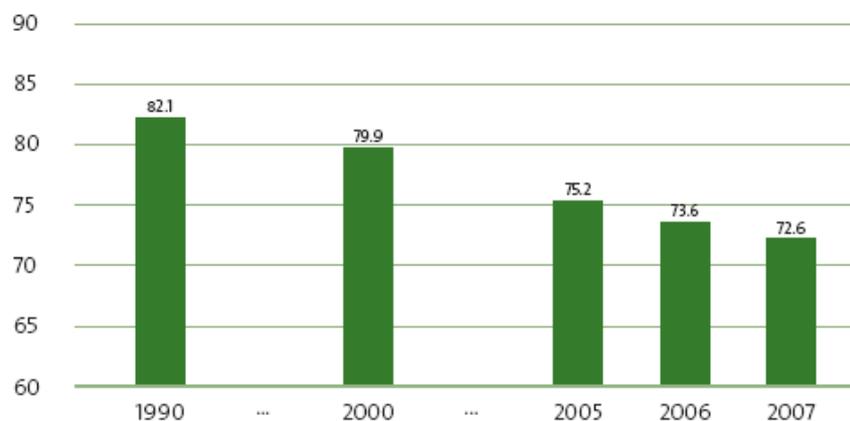
6.4.1 Internal measures

Technical measures

1) Reduce cement-clinker ratio

The main driver for reducing CO₂ emissions in cement production continues to be improvement in clinker factor, by substituting clinker in cement with appropriate secondary materials. Group average clinker factor improved from 75.2% in 2005 to 72.6% in 2007 (Figure 6.4). There are two main alternatives to clinker – blast furnace slag and pulverised fuel ash (PVA, or fly-ash). Slag is a non-metallic by-product of the steelmaking process, while PVA is waste produced when the flue gas from a coal-fired power station is ‘scrubbed’, which effectively means removing the noxious gases.

Figure 6.4: Average Percentage of Clinker in Cement



Material (clinker) substitution is by far the most efficient means through which to reduce cement emissions. This is because around 60% of emissions are released from the chemical processes occurring inside the kiln, with the remaining 40% come from the

burning of the fuel. Material substitution targets both of these sources, because less clinker is required in the first place, which also mean less fuel. Fuel substitution, on the other hand, reduces only the fuel-related emissions.

Holcim is currently the market leader for material substitution, with around 27% of alternative materials, including gypsum, being used in its cement in 2006, while the figure for most other companies was approximately 10%⁵.

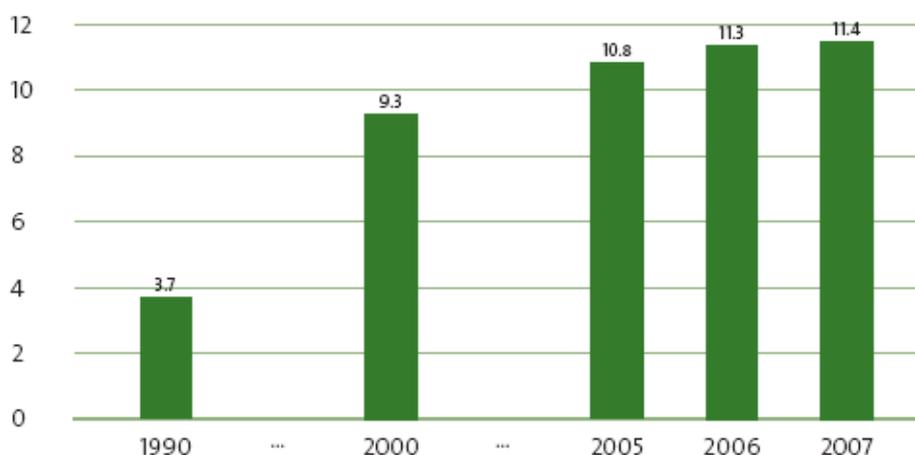
Material substitution has to be supported by customer engagement to encourage demand for sustainable and eco-efficient products, although this sometimes represents a challenge as it takes time to build trust in new products. It is important to ensure that the right cement product is used for the right purpose. Holcim is currently working with architects and construction companies to develop cement products with a low CO₂ content and energy saving features. Thus, product development, differentiation and marketing of composite cements are key for achieving CO₂ reduction. In 2007, 75% of cement types produced by Holcim contained significant amounts of mineral components. These are cement constituents that are not derived from clinker production and include blast furnace slag and fly ash.

2) Alternative fuels

Use of alternative fuels results in two savings. First, the CO₂ emitted per unit of energy content is lower than traditional fossil fuels, and secondly, there is an indirect saving associated with recovering these waste products. If they were not used in the cement kiln, they would either be land filled or incinerated, both of which result in their CO₂ being released to the atmosphere (although the EU ETS does not provide credit for avoiding these emissions).

In 2007, Holcim's thermal substitution rate was 11.4% (Figure 6.5); this is the rate at which the company substituted non-traditional fuels for standard fossil fuels and is equivalent to saving 2.1 million tonnes of coal and using 2.8 million tonnes of waste.

Figure 6.5: Percentage of thermal energy from alternative fuels



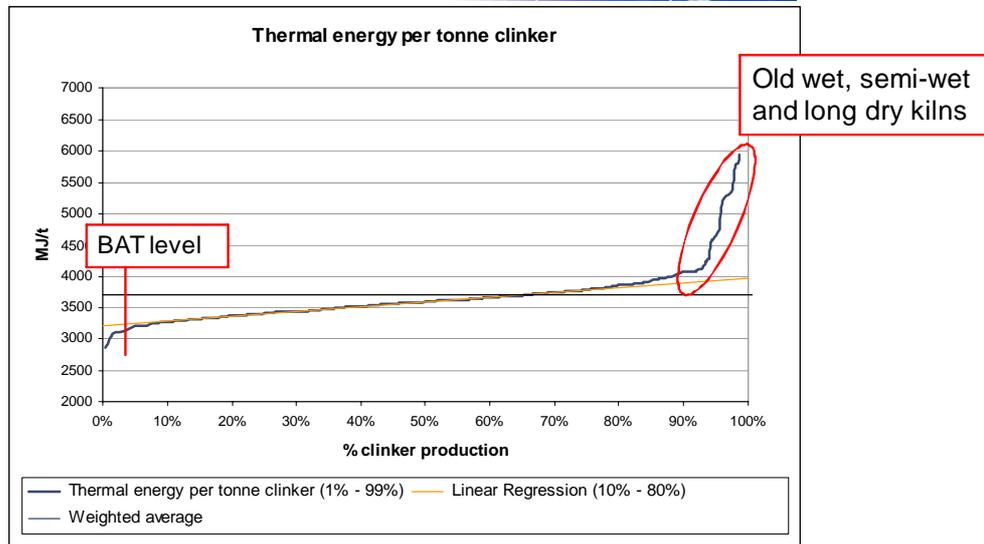
3) Improve Kiln technology – shift to dry kilns

The main denomination of cement production is between wet and dry clinker production process with semi-wet and semi dry production processes. Wet kilns use about twice as much fuel as dry kilns. But within each kiln technology type there was very little improvement of efficiency from 2000 to 2006. The potential for energy efficiency improvement of existing installations is very small. Improving thermal energy efficiency

⁵ http://www.thestrategyworks.com/articles/cement_abatement.html

requires asset renewal and investments in new kilns. Less than 10 % of European clinker production is from (semi) wet technologies (Figure 6.6). However, the current Best Available Technology is set at a very stringent level that less than 5 % of installations in EU27 meet that efficiency throughout the year (Figure 4.6).

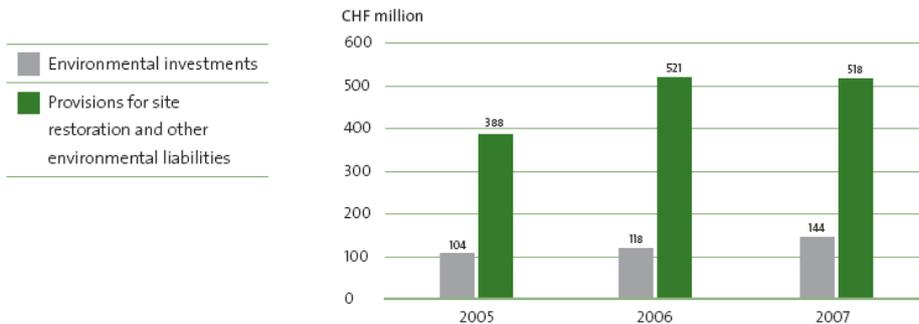
Figure 6.6: Thermal Energy per tonne of Clinker



Non-technical measures

4) Internal R&D and technology investment

The company's environmental investments have been gradually increasing over time. The Group is committed to ongoing investments and maintain appropriate provisions with respect to environmental liabilities, based on legal and contractual obligations.



5) 'Holcim Environment Services Trading'

Holcim has set up a subsidiary company which translates CO₂ saving into monetary value. The company provides information for trading under the EU-ETS by first balancing allowances internally then trading (buying for compliance or selling the excess). The same principles are applied for JI and CDM – reduce emissions where possible in-house and trade within the group first.

6) Promoting sustainable construction

The Group's ongoing innovation strategy focuses on process and product innovation as well as promoting sustainable construction. This is demonstrated by business operations and through the Holcim Foundation for Sustainable Construction⁶. The work

⁶ <http://www.holcimfoundation.org/>

of the Holcim Foundation promotes dialogue on sustainable construction among architects, planners, construction engineers and investors throughout the world and leverages resources to benefit society. In the field of process innovation, the company base their work on research carried out at Eidgenössische Technische Hochschule (ETH) Zurich.

7) Sustainability reporting (includes CO₂ reporting)

Holcim's sustainability report is aligned with the Global Reporting Initiative (GRI) G3 Sustainability Reporting Guidelines, at an application level of A+⁷. Holcim, along with 385 other organizations from 45 countries, is an Organizational Stakeholder of the GRI and a member of the GRI stakeholder council.

8) Renewable energy initiatives

Using renewable energy resources helps Holcim diversify its energy mix and achieve its CO₂ reduction target. Holcim has more than eight renewable energy projects in different stages of development in several countries, including the following initiatives qualifying under CDM:

- biomass and other alternative fossil fuel opportunities in Ecuador, India, Indonesia and the Philippines;
- a wind energy project in India;
- biomass and waste heat recovery for power generation in China, India and Thailand.

6.4.2 External actions and measures

Holcim engage with a wide range of partners and stakeholders all over the world in developing effective environmental and economic policies and mechanisms, and also contribute to research and development. This engagement informs and supports their environmental strategy.

1) World Business Council for Sustainable Development (WBCSD)*and the WBCSD Cement Sustainability Initiative (CSI)

Holcim initiated the World Business Council for Sustainable Development's member-led Cement Sustainability Initiative (CSI)⁸ in 1999 together with two industry colleagues. The objective was to find new ways to meet the sustainability challenge of:

- reducing the industry's ecological footprint;
- increasing stakeholder engagement; and
- understanding the industry's social contributions.

The CSI now represents more than half the worldwide cement industry outside of China. Holcim's active involvement with the WBCSD CSI task force on Climate Protection and CO₂ Management contributed to developing a possible "sector-based" approach that may help align and further advance the industry's collective action on climate change. Under this approach, an industry sector such as cement (rather than a country or a single facility) might assume a global/regional emissions or efficiency performance target. Inter-facility and/or inter-company negotiations to identify the most efficient mitigation approaches could help the entire sector reach this performance target more quickly, equitably and economically than under current schemes. Holcim

⁷ <http://www.globalreporting.org/AboutGRI/JoinGRI/>

⁸

<http://www.wbcd.org/templates/TemplateWBCSD5/layout.asp?type=p&MenuId=NzY&doOpen=1&ClickMenu=LeftMenu>

under the auspices of the CSI is working with the European Commission, OECD and UNFCCC to develop this global sectoral approach.

In 2006, the CSI initiated a key project: the “Getting the Numbers Right (GNR)” system⁹. Its objective is to obtain current and robust data for CO₂ and energy performance of clinker and cement production at global and regional levels across cement companies worldwide. It is a unique system that provides transparent and verifiable data.

2) European Cement Research Academy (ECRA)

Holcim is a member of ECRA, which is a platform upon which the cement industry supports, organises and undertakes research activities in the context of the production of cement and its application in concrete. ECRA has a programme in place for new technologies and further research¹⁰. It is currently very active in developing the use of carbon capture and storage¹¹ for capturing CO₂ arising from the combustion of fuels and from the treatment of raw materials in cement production.

3) Working with suppliers

The company engages in long-term relationships with suppliers and contractors to secure the most value-enhancing products and services. These relationships are the basis of working toward a sustainable supply chain. Holcim’s suppliers are expected to respect the company’s social and environmental policies. With this in mind, the Group procurement policy and supplier qualification programme includes a self-assessment of suppliers’ and contractors’ compliance with international social accountability standard SA 8000 and environmental standard ISO 14001.

4) Working with Universities

The Holcim Foundation for Sustainable Construction (described in 1.4.1, point 6) is dependent upon competent support, especially in the technical field. Five of the world’s leading technical universities have agreed to act as partners to the Holcim Foundation. Drawn from around the world, partner universities help to host the Holcim Forums; they define the evaluation criteria to be used for the Holcim Awards; and they put together the panels that judge the competition entries. Partner universities are:

- Swiss Federal Institute of Technology (ETH Zurich), Switzerland
- Massachusetts Institute of Technology (MIT) in Cambridge, USA
- Tongji University in Shanghai, China
- Universidad Iberoamericana (UIA), in Mexico City, Mexico
- University of the Witwatersrand, in Johannesburg, South Africa

5) Other international memberships and partnerships

Other memberships and partnerships at an international level include Global Legislators Organisation for a Balanced Environment (GLOBE), IUCN (The World Conservation Union), Gesellschaft für Technische Zusammenarbeit (GTZ) and the International Emissions Trading Association. Holcim Group companies also participate in local and regional initiatives, such as cement associations, the USA’s Environmental Protection Agency Climate Leaders Program, the Pew Centre on Global Climate

⁹ http://www.wbcscement.org/index.php?option=com_content&task=view&id=57&Itemid=118

¹⁰ http://www.ecra-online.org/downloads/pr_2009.pdf

¹¹ http://www.ecra-online.org/downloads/Rep_CCS.pdf

Change, the Asia-Pacific Partnership on Clean Development and Climate and the Centre for European Policy Studies (CEPS)¹².

6.5 Impact on company performance

Holcim's climate change and sustainability initiatives have had a positive impact on investor confidence. Improved share price performance generally reflects greater investor confidence. Investors increasingly demand CSR reporting and recognise that complying with climate change policy drivers has also helped the company to become more competitive. Though it is not possible to quantify the investments and the cost savings that are uniquely associated with CO₂ reduction measures. This is because efficiency investments and cost saving measures at cement plants and developments in product portfolios often are not focussed on CO₂ reduction as a primary outcome, but have been driven to some extent by CO₂ and do result in some measure of CO₂ savings.

Holcim believes that climate change policy will intensify competition in the future and its current and planned actions will help maintain a strong competitive advantage.

The company has achieved better customer relations and market image by providing more sustainable cement products.

Holcim saw its turnover rise by 9% in 2005 and a sustained growth of 10% in the first nine months of 2006.

Holcim has been included in both the Dow Jones Sustainability World Index and the Dow Jones STOXX Sustainability Index (Europe) for six years. Holcim Ltd has been named "Leader of the Industry" in the Dow Jones Sustainability Index and has thus been acknowledged as the company with the best sustainability performance in the building materials industry for the last four consecutive years. According to the DJSI assessment, Holcim is successfully addressing core sustainability issues related to its industry: The Group's recycling strategy, its dialogue with stakeholders as well as its efforts in human resources development received top scores in 2008.

Holcim has once again been included in the FTSE4Good Index series for 2008. FTSE4Good is a tool for socially responsible investors (SRI) to identify and invest in companies that meet globally recognized corporate responsibility standards. Core indicators across environmental, social, stakeholder relations and human rights criteria are used to assess companies for inclusion in the index. According to the FTSE4Good classification process, Holcim's operations are high impact, leading to more stringent criteria in the areas of policy, management systems and the reporting of performance.

Holcim has won number of awards for its environmental and sustainability initiatives from all over the world¹³.

6.6 Impact on jobs and skills

6.6.1 Impact on jobs

New jobs have been created at both the corporate and technical level. The corporate head office employs 6FTE people working on climate change issues such as engagement with policy makers, internal communication and sustainability management.

The company has systems in place which integrates CO₂ and energy in all aspects of the business. Even though only a handful of people of the 90,000 worldwide strength of the company work exclusively on climate change related tasks, a substantial number of employees have CO₂ related responsibility as a part of their job profile.

¹² <http://www.holcim.com/sustainable>

¹³ http://www.holcim.com/CORP/EN/id/1610652505/mod/7_6/page/editorial.html

Holcim's product development team's activities are greatly affected by climate change policy drivers. The team work closely with architects and construction companies to develop cement products that meet the latest EU Buildings and Energy Efficiency standards.

Holcim's marketing and communication team are increasingly working with their customers and policy makers to include green clauses in tenders which require low CO₂ cement.

Each of the 11 companies in Europe has at least one FTE person in charge of CO₂ compliance and management.

Holcim's initiatives to reduce carbon emission by clinker substitution and alternative fuels would create direct and indirect jobs. Both measures require sorting, treatment, cleaning and transportation of materials creating additional jobs. However, it is not possible to quantify these jobs.

6.6.2 Impact on skills

The company strongly believes that carbon management and compliance should be integrated in all functions of the companies.

All staff whether in financial, administration or technical are trained on monitoring and reporting of CO₂. This has greatly improved the understanding of how their role affects CO₂ performance and what they can do to improve it and at what cost.

At the technical level, kiln engineers are trained on the fuel mix optimiser along with a financial software which translates the CO₂ savings attributed to the optimal fuel mix into monetary terms based on the EU ETS allowance price. This ensures that engineers are aware of how their performance affects the company's profit margins.

Holcim Group companies report that in 2007, employees across the Group each received on average 31 hours of (general) training, and at Group level, new leadership programs complement existing management training focused on imparting leadership competencies. Developing leaders and employees is, and remains, one of the Group's most important tasks.

6.7 Future implications of climate change policy drivers

Holcim has generally been receptive to the EU ETS. However, some concerns still remain regarding the imposition of an absolute cap on EU industry, in isolation from global industry and other sectors of society and the allocation of emission allowances based on past absolute emissions instead of future efficiency performance.

Auctioning of allowances will be the main principle for the EU ETS in the long run. For the five-year period beginning 1 January 2008, Member States must allocate 90% of the allowances free of charge and auction the rest. From 2013 a transitional system is foreseen for the cement industry starting with free allocation at a level of 80% of their share in the total quantity of allowances to be issued, decreasing by equal amounts each year, arriving at zero free allocation by 2020. Transitional free allocation to installations would be provided for through harmonised Community-wide rules ("benchmarks") in order to minimise distortions of competition within the Community.

Auctioning without a global CO₂ market and benchmarking could lead to substantial production, investment and carbon leakage for the EU Cement industry. The CO₂ emission per tonne cement and per m³ concrete is comparatively low but the financial exposure is very high. The full cost of CO₂, incurred with auctioning or on the marginal production volume is higher than all other production costs combined, @ 45 €/ton CO₂ carbon price or up to twice the non-EU import transport cost.

According to a study by the Boston Consulting Group for Cembureau¹⁴, with full auctioning in 2020 and at CO₂ prices of € 35 per tonne, all integrated clinker – cement production in the EU would be wiped out of the EU leading to a loss of approximately 40,000 direct jobs and €4.2 billion gross value added (GVA) per year. The replacement of domestic production by imports would also result in increased global CO₂ emissions as the European cement industry is demonstrably the best world performer in lowering net CO₂ emissions and as a result of extra CO₂ emissions from transport.

Holcim thus stresses the need for a global framework for emissions trading and setting a sectoral benchmark based on historic and actual emission information. It foresees a rigorous project-by-project demonstration of additionality and definition of the baseline, following an objective standardized sectoral benchmarking approach.

6.8 Lessons for other companies and sectors

Holcim sees the following as lessons that may be applicable to other companies and sectors:

- Holcim welcomes the concept of emissions trading as a means to use the power and flexibility of the market to achieve an environmental objective in the EU. It has also taken steps and taken initiatives to improve the system. The company has shown leadership for improving the allocation mechanism and has actively worked under the WBSCD CSI framework to promote benchmarking and fit within a global framework.
- A key lesson from Holcim's activities is making eco-efficiency is the core of its business – producing more cement while using fewer resources and producing less waste and pollution per tonne of cement. Given that concrete¹⁵ is the second most used resource in the world after water and currently there is no practical substitute for this versatile and durable product for most purposes, this is a very important principle.
- The company policy of involving its entire staff in its sustainability and carbon management process creates motivation and buy in.
- Good communication, engagement and CO₂ reporting increases investor confidence and customer loyalty. It also helps policy makers in decision making by increasing trust and transparency.
- Demonstrated that integrating sustainability strategy into core management systems can create value for its stakeholders and can secure the company's long-term success.

¹⁴ http://www.cembureau.be/Cem_warehouse/CEMBUREAU%20PRESS%20RELEASE%20-%20PRESS%20CONFERENCE%20-%20CARBON%20LEAKAGE.PDF

¹⁵ Cement is the chief ingredient in concrete and therefore a key requirement of modern society.

7 CASE STUDY 5: CEMENTA – HEIDELBERG CEMENT GROUP

7.1 Summary

Cementa AB is one of Sweden's largest building and material companies. It is part of the international group HeidelbergCement. Cementa, founded in 1871, manufactures and markets cement and provides advisory services on the use of cement-based products. The company employs 425 people and had a turnover of €196 million in 2008.

The EU ETS is the main climate change policy driver and has greatly influenced the strategic thinking of the company. In addition, the company has internally initiated a number of carbon saving measures.

Cementa is reducing net emissions of carbon dioxide mainly by increasing the use of alternative fuels, by reducing the clinker content in cement and continually improving the energy efficiency of the manufacturing process. Cementa's specific CO₂ emissions fell by 11% in 2007 compared to 1990, which means they are on track for achieving the HeidelbergCement Group's overall objective of a 15% reduction by 2010. The main means to reduce CO₂ emissions direct and indirectly are:

- by increasing the use of alternative fuels by 34% compared to 2004 and by increasing the use of biomass;
- using the excess heat from the furnaces to generate electricity and district heat for reuse in two of their plants;
- by increasing the rate of recycling concrete, much of the CO₂ liberated during the cement manufacturing process is increasingly reabsorbed by the concrete;
- by making cement transportation more energy efficient by better route planning and ensuring that transportation service providers comply with all legal requirements concerning environment, safety and noise; and
- by working on improving the environmental impact of cement and concrete in its use phase. The company is working on technologies to better utilise concrete's ability to store heat and energy. Better building design and use of modern concrete can reduce energy demand by 10% and subsequent CO₂ reductions.

Externally, Cementa as part of HeidelbergCement Group joined forces with ten international cement companies to develop the Cement Sustainability Initiative (CSI) within the World Business Council on Sustainable Development. The CSI is an agenda for the promotion of sustainable development in the cement industry. The company is also working with construction companies, architects and builders to develop more sustainable cement products. Cementa maintains close association with cement and concrete sector associations in Sweden and Norway. These partnerships are important for communicating with politicians and for conducting R&D.

The group's investors are increasingly demanding more sustainable initiatives. The company believes its sustainability measures are important for meeting its objective to add value for customers, employees, suppliers and shareholders. The company's sustainability performance also reflects consumer choice, as consumers are increasingly demanding more environment friendly cement products.

CO₂ reduction measures have had the following impact on jobs and skills:

- the demand for alternative fuels has led to the creation of direct and indirect jobs;
- Cementa employs 12 FTE people in its R&D unit, looking at new generation cement products with low carbon footprint;
- the company is investing in training and upskilling of existing jobs;

- to implement the CO₂ saving measures, Cementa is making efforts to develop existing expertise and recruit new talent; and
- Cementa is working with concrete and cement sector associations in Sweden for developing training packages on best practices and to have clearer and regular communication with government.

7.2 Introduction

Cementa AB, founded in 1871, is one of Sweden's largest building material companies and is part of the international group HeidelbergCement. The company manufactures and markets cement and provides advisory services on the use of cement-based products. Cementa's workforce involves process technicians, process engineers, mechanics, electricians, designers, analysts and vendors, administrators and technicians in the market and R&D of cement and concrete. The company employs 425 people and had a turnover of €196 million in 2008.

Cementa AB along with Norcem AS and Kunda Nordic Tsement AF are part of HeidelbergCement Northern Europe, with turnover of €1 billion in 2007. Heidelberg Cement Northern Europe employs around 3,300 people.

Cementa recognises that climate change and sustainability is an important government policy issue and public interest. The company's approach to the environment changed from reactive to proactive since the early 1990s. The company initiated a CO₂ life cycle analysis of cement in the 1990s and undertook substantial investment between 1993 and 1998 to improve the environmental impact of its plants.

7.3 Key climate change policy drivers for change so far

Company initiative

The HeidelbergCement group recognises that sustainability plays a key role in minimising operational risks, generating business opportunities and adding value for key stakeholders and society. Due to the local and regional impacts of its industry it has taken responsibility to reduce its environmental impact. At the Group level a Sustainability Committee determines group-wide sustainability strategies, programmes and objectives, and assesses how well these are met. Environmental protection is managed by the Group Environmental Committee, comprising experts who determine guidelines, goals and the required measures in this area.

Regulatory drivers

In addition to the company's environmental standards, Cementa also has to comply with the EU Construction Products Directive (Council Directive 89/106/EEC) and the IPPC directive. It also has to comply with Swedish Environmental and Energy policies.

However, the EU ETS is currently the main policy driver for change. The EU ETS is fundamentally affecting all activities of the company from investment decisions (scale and timing), logistics and adjustment to market conditions. HeidelbergCement Northern Europe allocations under the EU ETS were more or less in line with their requirements except when they introduced a third production line at the Kunda plant, making it necessary to purchase CO₂ allowances. However, the company expects future auctioning of allowances would undermine its competitiveness.

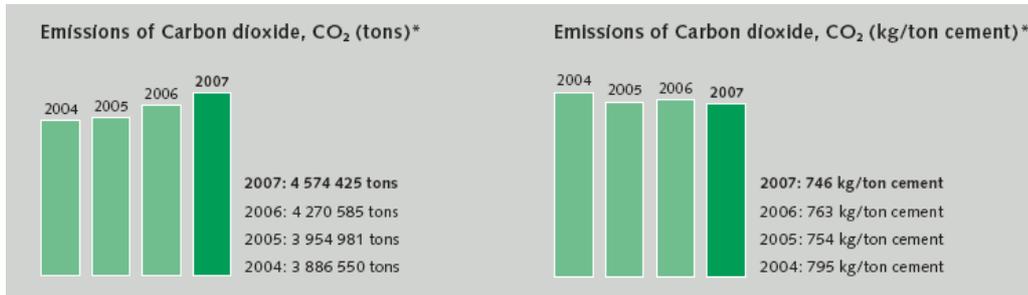
Customer needs

Customers are increasingly demanding more sustainable cement products. The new guidelines and requirements from EU and member state building standards demand higher environmental standards.

7.4 What has the company been doing so far?

The calcination process and the combustion of fuel in cement production results in carbon dioxide (CO₂) emissions. Around 60% of CO₂ emissions in cement manufacturing are process emissions tied to decalcification of limestone to produce clinker. Process emissions are intrinsically linked to the production process and cannot be reduced beyond certain levels determined by the laws of physics. Even though the latest cement products have advantages from a CO₂ lifecycle perspective, the nature of the production process is such that the cement industry on a global level accounts for around 4-5 % of the world's total carbon dioxide emissions.

In 2007 Cementa cement plants emitted 719 kg CO₂ per tonne of cement, which is equivalent to a reduction of 11% since 1990. Corresponding figures for all six cement plants in HeidelbergCement Northern Europe is 746 kg CO₂ per tonne of cement and a reduction of 17%, see figure below.



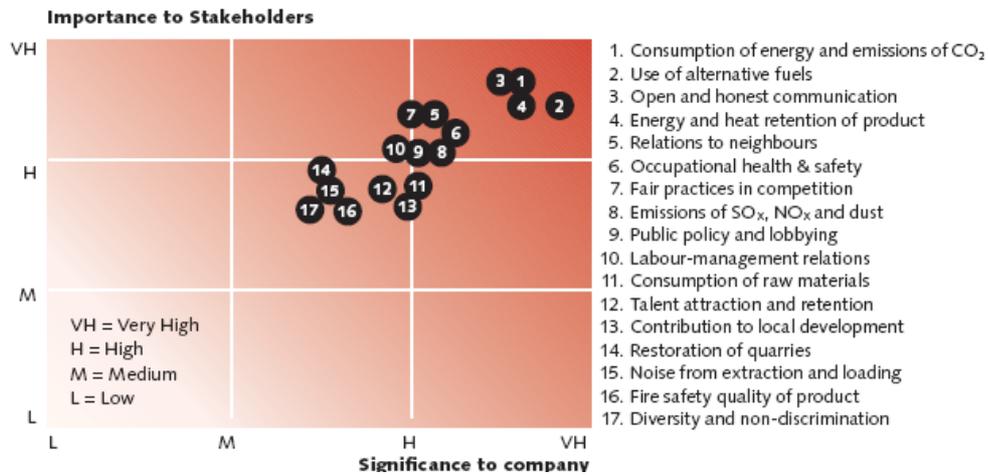
* Verified CO₂-emissions according to the EU Emission Trading Scheme.

Cementa is reducing net emissions of carbon dioxide mainly by further increasing the use of alternative fuels, by reducing the clinker content in cement and continually improving the energy efficiency of the manufacturing process.

As part of its sustainable management plan, Cementa has structures in place to systematically set, review and update objectives for sustainable development. Regular assessments and improvements of operations are made through the environmental management system and procedures.

In 2008, the company invited a number of key stakeholder representatives in Estonia, Norway and Sweden to provide input to the selection and prioritisation of sustainability issues. The external input was matched with internal viewpoints and the results – indicated a shared view of challenges (Figure 7.1). Issues important to stakeholders and the company were highlighted in the company CSR document and overall sustainability strategy and management.

Figure 7.1: Matching Stakeholder and Company Views



Focus and objectives

Cemeta has a target to reduce CO₂ emissions from manufacturing process by:

- reducing the specific net emissions of CO₂ by 15% by 2011 compared to 1990 (kg CO₂ per tonne of clinker);
- reducing the specific net emissions of CO₂ by 23% by 2011 compared to 1990 (kg CO₂ per tonne of cement); and
- reducing the absolute net emissions of carbon dioxide (million tonnes CO₂).

Achievements

- The company's specific CO₂ emissions fell by 11% in 2007 compared to 1990, which means they are on track for achieving the HeidelbergCement Group's overall objective of a 15% reduction by 2010.
- By using alternative fuels and additives, as well as by reducing the amount of clinker in the cement, Cemeta have reduced CO₂ emissions per tonne cement by 10% compared to 2004. Currently, alternative fuels account for 27% of total amount of fuels.

Investments related to climate change policy drivers

Cemeta were able to provide us with more specific environment related investment data to comply with climate change policy drivers. Investments for alternative fuels and CO₂ savings and energy efficiency are given in Table 7.1 below. In 2007, total investments of €4.5 million were around 3% of company turnover.

Table 7.1: Investments in Alternative Fuels, CO₂ Saving and Energy Efficiency (€ million)

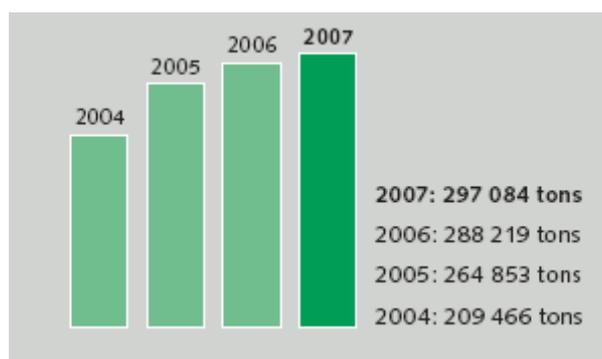
Cemeta Plants	2006	2007	2008	Measures
Slite	2.8	1.3	0.3	New more efficient klinker cooler and calciner furnace improvement.
Skövde	0.0	1.6	0.1	Tyre burning
Degerhamn	0.0	1.6	0.0	Raw meal drying with waste heat saving oil.
Cemeta Total	2.8	4.5	0.8	Part of wind farm for electricity (CO ₂ -free) included in 2008

7.4.1 *Internal actions and measures*

1) *Increasing the use of alternative fuels*

One of the main means of reducing CO₂ emissions is to increase the use of alternative fuels, such as waste derived fuels and biomass (Figure 7.1). Using alternative fuels instead of fossil fuels not only reduces CO₂ emissions but also helps society resolve waste management issues. This is an effective way of resolving waste disposal challenges and, creating a “win-win” situation for the company and for society at large.

Figure 7.2: Use of Alternative Fuels in Heidelberg Cement Northern Europe cement plants



In 2007, Cementsa succeeded in increasing the use of alternative fuels by 34 percent compared to 2004 and in increasing the use of biomass.

The use of alternative fuels also entails some challenges. Since fuels vary in type and quality, technical solutions are needed for reception, control and feeding, while supply requires proximity to urban centres where residue is produced. Future key challenges include identifying new biofuels and collaborating with society to find solutions that minimise transport.

2) *Reusing excess heat from production*

Cement production involves extensive heating and cooling. Heat is needed to calcinate the limestone and cooling is needed to preserve the cement minerals created in the process. Outside air is used to cool the clinker – this warms the air, which is then used to dry raw materials entering the process. At the Cementsa Slite plant, excess steam is used to generate electricity for reuse in the plants. Here the electricity from excess heat corresponds to 10% of the total electricity consumed. At the Cementsa Skövde plant, excess heat from production is used to provide district heating, enhancing energy efficiency in the community.

3) *Recarbonisation from demolition*

Demolition concrete has the potential to reabsorb much of the CO₂ liberated during cement manufacturing process. This process is known as recarbonation. This means that cement industry’s contribution to global CO₂ emissions can be reduced, by increasing the use of recycled concrete.

4) *Making transport efficient*

Most of the Cementsa’s plants and major depots are located on the coast or near major waterways. This means a large proportion of cement products can be transported in bulk on specially designed vessels, resulting in very low emissions. Cementsa regularly consult with the vessel companies to check that all legal requirements concerning environment, safety and noise are followed. Inland transportation is conducted by truck or by rail. The amount of transport corresponds to production volumes and increases when more cement is

produced. Cementa is working to improve its transportation route planning so that loading capacity is maximised in both directions (loading and unloading).

5) Product development

Cementa is also working on the improving the environmental impact of cement and concrete in its use phase. The company is working on technologies to better utilise concrete's ability to store heat and energy. Better building design and use of modern concrete can reduce energy demand by 10% and subsequent CO₂ reductions.

Cementa has also worked with the Swedish National Road and Transport Research Institute to increase the potential for concrete roads to lower fuel consumption for cars and trucks. In theory concrete roads provide lower specific fuel consumption. This was confirmed by a joint study by Cementa and Swedish National Road and Transport Research Institute which found that concrete roads in Sweden had slightly (1-4%) lower specific fuel consumption.

6) Other options

Some other options being developed by Cementa are:

- to continue to develop best available technique (BAT) focusing on process optimisation and an increase in the use of alternative fuels, with an emphasis on fuels with high biomass content.
- To reduce the need for non-renewable raw materials, Cementa are testing ways to reduce the clinker content in cement.
- HeidelbergCement Northern Europe are also working to enable investments in new dry kiln technology for the Kunda plant.

7.4.2 External actions and measures

Cementa recognises that working in partnership is essential to successfully deal with future climate change related challenges. The company works with a wide range of partners and are also members of different organisations. Some of the main external actions and measures are outlined below:

- Cementa as part of HeidelbergCement Group joined forces with ten international cement companies to develop the Cement Sustainability Initiative (CSI) within the World Business Council on Sustainable Development. The CSI is an agenda for the promotion of sustainable development in the cement industry.
- Working with construction companies, architects and builders to develop more sustainable cement products.
- Other partnerships include with the Eesti Betooniühing (Concrete Association of Estonia) in Estonia, Byggsektorns kretsloppsrad in Sweden (Cement Association Sweden), and byggutengrenser.no in Norway (Cement and Concrete Association in Norway). Since the cement and concrete industry is a relatively small sector compared to say the timber industry in Sweden, the sector associations had to take measures to increase their visibility to the Swedish government and parliament. The main measures involved disseminating information: meetings, leaflets, reports, articles etc, to make the cement and concrete industry an important group with which elected politicians could communicate. Cementa have also co-financed R&D projects with sector associations.
- The communication team maintains regular dialogue with government authorities and NGOs. This is done by regular meetings, newsletters and workshops. External communications, R&D, customer relations all dialogue takes into consideration environmental responsibility.

- Universities and Colleges in different areas of research as the main Universities in Sweden, Lund technical University, Prof. Lars Olof Nilsson, Prof. Sven Telanderson, Luleå technical University Prof. Thomas Olofsson, Prof. Mats Emborg, Kungliga tekniska Högskolan (Royal Institute of Technology) in Stockholm, Prof. Håkan Stille, Umeå University, Prof. Rainer Backman and institutes like CBI, YKI, SP, IVL

7.5 Impact on company performances

The group's investors are increasingly demanding more sustainable initiatives. Recent investment in biomass as an alternative fuel has been largely driven by investor demand. The company's turnover has been increasing on an annual basis: from €157 million in 2006, €172 million in 2007 and €196 million in 2008.

The company believes its sustainability measures are important for meeting its objective to add value for customers, employees, suppliers and shareholders. Also to care for the natural resources that forms the basis of its business and to promote an awareness of responsibility towards employees and local communities.

The company's sustainability performance also reflects consumer choice, as consumers are increasingly demanding more environment friendly cement products. Hence, the company is working closely with its customers for developing products with low carbon footprint in its production and use phase.

7.6 Impact on jobs and skills

7.6.1 Impact on jobs

Main effect of climate change policy drivers has been in the education and up skilling of existing jobs. A kiln operator's job now is more complicated and technically demanding compared to 10 years ago. Earlier cement quality and cost were the main monitoring parameters. Now kiln operators also have to monitor energy and emission levels when operating the kilns. This has required constant training and greater demand for engineers with university degrees.

Productivity has been increasing over time reflected in less man-hours per unit of output.

The demand for alternative fuels has led to the creation of direct and indirect jobs. Cementa have hired services from other companies to process, cut and handle the raw materials to be used as fuel. The Slite plant in Gotland for example, can use household waste and tyres as fuel. This has led to the establishment of a system for collection, sorting and treatment and transportation of waste. The plant supports around 20 jobs directly and indirectly for the alternative fuel production. The plant in Skövde (mainland Sweden) has a collection point for plasterboards close to the plant. The waste company working with Cementa has established a reception facility where the material is sorted, quality controlled and the paper and all non-gypsum materials are removed. Around, three people are working at the site and some more on transport, maintenance and marketing. The transient and transferrable nature of these jobs makes it difficult to predict precise numbers.

Cementa also employs 12 FTE people in its R&D unit, looking at new generation cement products with low carbon footprint. Cementa is also working on a project called 'CLOCK' which is looking at further ways to reduce energy consumption and CO₂ capture in cement and lime manufacturing processes. Cementa normally employs one or two candidates for the doctor degree now working on the 'Clock' project.

7.6.2 Impact on skills

To implement the CO₂ saving measures discussed above, Cementa are making efforts to develop existing expertise and recruit new talent. Recruitment process looks for higher sustainability skills at both technical and corporate level. Cementa believes that this will allow them to maintain a competitive edge.

Training on best practices and complying with regulation is also provided by concrete and cement sector associations in Sweden.

The Group Human Resources department coordinates occupational health and safety and sustainability activities supported by the Group Environmental Committee. In 2006, a Group policy on occupational health and safety for employees, subcontractors, customers and suppliers was established.

7.7 Future implications of climate change policy drivers

The main climate change policy driver that can have a significant impact on the company in the future is the revision of the EU ETS from 2013. The cement industry generally is vulnerable to carbon and production leakage due to the EU ETS. This can further deteriorate with full auctioning as planned in the ongoing EU Emission Trading Scheme (ETS) negotiations.

According to a study by the Boston Consulting Group for Cembureau¹⁶, with full auctioning in 2020 and at CO₂ prices of € 35 per tonne, all integrated clinker – cement production in the EU would be wiped out of the EU leading to a loss of approximately 40,000 direct jobs and €4.2 billion gross value added (GVA) per year. The replacement of domestic production by imports would also result in increased global CO₂ emissions as the European cement industry is demonstrably the best world performer in lowering net CO₂ emissions and as a result of extra CO₂ emissions from transport.

Cementa, represented by Cembureau, is working with EU authorities to ensure that Europe does not secure its own targets by relocating the emissions outside its borders, and increasing CO₂ emissions globally. The EU Cement Industry is demanding an international emission trading framework and setting a sectoral benchmark based on historic and actual emission information.

7.8 Lessons

Cementa sees the following as lessons that may be applicable to other companies and sectors:

- Cementa is a good example of how a 135 year old company is now a modern high-tech company. Regular investments to reduce the environmental impact in the 1980s and early 1990s as a company initiative have helped the company maintain its competitive edge.
- The company has invested in R&D for production technologies and product development both internally and with external partners. This has greatly widened the scope for reducing CO₂ emissions when looking at the CO₂ life-cycle of cement and concrete products.

¹⁶ European Cement Sector Association
http://www.cembureau.be/Cem_warehouse/CEMBUREAU%20PRESS%20RELEASE%20-%20PRESS%20CONFERENCE%20-%20CARBON%20LEAKAGE.PDF

8 CASE STUDY 6: COCA-COLA

8.1 Summary

Coca-Cola is a well-known international beverage company. The Company recently launched its Energy Management and Climate Protection Strategy, which applies to both the Company and its bottling partners, which are independent to the company. This strategy aims to reduce the company's carbon footprint by targeting three specific areas of Coca-Cola's operations: cold drink equipment, manufacturing plants and the vehicle fleet.

Climate change policies remain secondary to maintaining a strong reputation amongst its customers as a driver for the Company's actions to reduce their carbon footprint. The Company believes that consumers are becoming increasingly environmentally conscious, and that this is reflected in their purchasing decisions. Coca-Cola views it as important to be 'seen to be doing the right thing', in order to maintain its advantage in the market and to retain customer loyalty. Most of the Company's actions to reduce its carbon footprint remain voluntary, and the Company has identified three particular areas which it believes it has the most opportunity to impact through its climate protection strategy:

- Cold-drink equipment – improving the energy efficiency of its coolers, vending machines and fountain equipment and reducing greenhouse gas emissions by shifting towards the use of new, non-HFC refrigeration equipment
- Facilities and bottling plants – reducing emissions in manufacturing by moving to investments in combined heat and power (CHP) and renewable energy, efficient lighting, compressor optimization and heat recovery, mainly through an initiative called *Project esKO*, launched in 2007
- Transportation – although the 'transportation footprint' is relatively small compared to other Company activities, Coca-Cola is aiming to expand its hybrid electric fleet of delivery trucks, which are over 30% more fuel-efficient than traditional delivery fleets and produce less emissions when idling or stopped in traffic

The Company does not appear to have been negatively impacted in financial terms by climate change policies. However, water quality and quantity have been cited as a business risk in the past and the Company has stated that "as demand for water continues to increase around the world, we expect commitment and continued action on our part will be crucial in the successful long-term stewardship of this critical natural resource".¹⁷

Climate change policies do appear to have impacted both jobs and skills within the Company, although this has mainly been in the area of new job creation in environmental posts, and an upskilling of existing staff. There have been no redundancies in the Company as a result of climate change policies. New jobs have been created in Coca-Cola in the last 2-3 years to fill 'gaps' in knowledge about strategic political and stakeholder issues, and water stewardship. Many positions within both the Company and its bottling partners are currently being upskilled to reflect a greater emphasis on environmental monitoring and implementation work. Internal initiatives are also being taken to roll out a better understanding of climate change policies across all staff, whether or not they have a particular environmental remit.

Coca-Cola sees itself as having taken a 'leadership role' in its sector in terms of voluntary efforts to reduce their carbon footprint. One of the areas in which this has been best demonstrated is in refrigeration equipment for cold beverages, where Coca-Cola has invested in the innovative technology required to achieve this, and has taken steps to shift

¹⁷ CERES (2008) Corporate Governance and Climate Change: Consumer and Technology Companies; Coca-Cola company profile within Beverages sector report

the commercial market for coolers from traditional to HFC-free coolers. Coca-Cola remains positive that taking leadership roles in environmental performance are important for retaining consumer loyalty now and into the future. However, the Company believes that more financial incentives should be made available to companies such as Coca-Cola, who are making significant voluntary efforts to develop innovative technology to reduce the carbon footprint of their activities, but are often prevented or discouraged from doing so due to cost implications.

8.2 Introduction

Established in 1886, The Coca-Cola Company operates in more than 200 countries and markets more than 450 brands and 2,800 beverage products. These products include sparkling and still beverages, such as waters, juices and juice drinks, teas, coffees, sports drinks and energy drinks. The Coca-Cola Company owns four of the world's top five non-alcoholic sparkling beverage brands: Coca-Cola, Diet Coke, Sprite and Fanta.

At the end of 2007, the Company had approximately 90,500 employees globally. The 'Coca-Cola system' comprises the Company and its 300 or so bottling partners, most of which are independent of the Company and not owned or controlled by Coca-Cola. In 2008, net operating revenues totalled US\$31,944 million. Gross profit for the same period was US\$20,570 million, and net income was \$5,807 million.¹⁸

Coca-Cola's environmental commitments are focused on areas which it believes it has the greatest opportunities to make a significant difference in – water stewardship, sustainable packaging, energy management and climate protection. Coca-Cola recently introduced its Energy Management and Climate Protection Strategy, a mitigation strategy which applies to both the Company and bottling partners. The strategy focuses on three principal components of operational impact: cold drink equipment, manufacturing plants and the system-wide vehicle fleet. Energy efficiency is considered to be central to all of these areas. Coca-Cola has also adopted a climate change adaptation strategy focused on water – the Global Water Stewardship programme.

8.3 Key climate change policy drivers for change so far

The key climate change policy drivers for the Coca-Cola system (referring to both the Company and its bottling partners) are the following in order of importance:

1. Reputational risk

This is considered to be perhaps **the** key driver for Coca-Cola in terms of driving its actions on responding to climate change policies. The Coca-Cola brand is seen as the 'lifeline of the organisation', and one which needs to be protected and maintained. External expectations – predominantly those of the consumer – are key to Company, and the Company has anticipated that consumers are increasingly selecting brands which are proactively taking initiatives to reduce their environmental footprint. Therefore, 'being seen to be doing something' is extremely important to companies such as Coca-Cola, and Coca-Cola sees its climate and water protection efforts as being a source of potential competitive advantage.

2. Company initiative

Coca-Cola does not consider itself to be a major emitter of greenhouse gases despite being a large global brand. A recent assessment it carried out of its activities estimated that they were responsible for no more than 0.1% of emissions in Europe, and this was largely from bottling activities. However, they have undertaken a large number of mainly voluntary

¹⁸ Coca-Cola 2008 Annual Review

actions in recent years to reduce their carbon footprint, and believe that they are in a strong position to educate consumers on its environmental initiatives and to build brand loyalty.

- Efficiency gains: Coca-Cola's main goal is to "grow the business but not the carbon." They have set themselves targets (see below) to reduce absolute carbon emissions from manufacturing operations by 5% on 2004 levels and are in the process of setting targets on emissions reductions from packaging and cooling.
- Reducing business risks: Coca-Cola considers it essential to understand business risks, and that looking long-term, it believes climate change and related policies will have an impact on the market, production and the supply chain. Taking actions which anticipate these risks places them in a stronger position to continue running the business profitably but in a sustainable manner.
- Business opportunities: Climate change protection activities also present business opportunities. Integrating energy efficiency into sales equipment offers Coca-Cola a competitive advantage and they are currently developing the technology to produce HFC-free commercial refrigeration. A wide and successful rollout of this technology would enable them to transform the commercial market for HFC-free refrigerators and give them market leadership. However, the interviewee has suggested that the cost implications of such innovative technology are likely to be a barrier to achieving widespread HFC-free refrigeration.
- Future-proofing the business: There is an anticipation that the widening of the emissions trading scheme will lead to higher energy costs and impact on costs for the business, for example in packaging. Potential impacts on the supply chain and rising direct energy costs are likely to be a driver in the future, and the Company is taking actions now to account for this. One example is the production of their own energy from CHP or renewables, but this remains only a small fraction of the total energy required for operation.

3. Physical risk

In 2007, Coca-Cola used approximately 300 billion litres of water in their plants to produce their beverages¹⁹. Water stewardship is high on the list of Coca-Cola's sustainability efforts, and Coca-Cola is implementing a portfolio of global water stewardship measures. As global hydrologic resources continue to be impacted by climate change, they believe these adaptation measures will help maintain their competitive advantage. Coca-Cola is working on operational water efficiency and is moving towards water neutrality.

4. Regulatory risk

EU commitments to reducing its overall emissions to at least 20% below 1990 levels by 2020, post-Kyoto climate change policy and the future of the Emissions Trading Scheme have all helped to 'set the direction of travel' for Coca-Cola's efforts to reduce their carbon footprint. The EU Water Framework Directive (WFD) has also set the basis for Coca-Cola's voluntary initiatives in sustainable water management, which are an 'add-on' to their compliance with legal requirements.

8.4 What has the company been doing so far?

According to the CERES company profile²⁰, Coca-Cola's vending machines and coolers produce three times the estimated emissions of its manufacturing facilities and more than five times the emissions from its fleet. Coca-Cola's single largest emission of greenhouse gases comes from keeping their beverage products cold. Coolers, vending machines and

¹⁹ Coca-Cola Sustainability Review 2007-08

²⁰ CERES (2008) Corporate Governance and Climate Change: Consumer and Technology Companies; Coca-Cola company profile within Beverages sector report

fountain equipment impact the environment in three ways: energy use, insulation foam and refrigerant in the cooling system.

8.4.1 Internal actions and measures

There are three environmental 'strands' which Coca-Cola is focusing on: packaging (and the waste associated with it); water and water neutrality and carbon and energy. Central to activities in all these strands is to 'stop and reverse'.

Packaging: measures are likely to involve a move towards 'lightweighting'- taking weight and material out of their packaging. In Great Britain, the glass Coke bottle is now 20% lighter. Coca-Cola has also invested more than \$60 million to build the world's largest plastic bottle-to-bottle recycling plant and support recycling in the United States (South Carolina). The plant, fully operational from 2009, aims to produce approximately 100 million pounds of food-grade recycled PET (polyethylene terephthalate) plastic for reuse each year – the equivalent of producing nearly two billion 20-ounce Coca-Cola bottles.

Putting more recycled content (rPET) back into bottles yields financial benefits, and requires less energy than producing bottles with virgin materials, reducing waste and greenhouse gases. Coca-Cola is intensifying efforts to increase recycling in Europe, and to take actions 'beyond the 'legal framework' to increase awareness, particularly amongst customers. In 2007, Coca-Cola launched a new line of licensed merchandise made from recycled beverage packaging materials - these products were aimed at 'merging trends with environmental consciousness' and helping remind customers that 'small steps' such as recycling a bottle could make a difference to preserving the environment²¹.

Carbon and energy

Targets: Coca-Cola has set a target for reducing absolute carbon emissions in manufacturing operations across developed countries by 5% on 2004 levels, with differing timescale targets according to country. In Great Britain, this target is to be achieved by 2015. According to the interviewee, this absolute target is seen as particularly proactive in comparison to relative targets (e.g. per litre produced), which tend to be set by other companies.

In 2000, Coca-Cola made a commitment to improve the energy efficiency of its cooling equipment by 40-50% by 2010, and is, according to its Sustainability Review 2007-08, on course to meet this target. In 2006, Coca-Cola completed the transition to insulation foam that is free of hydrofluorocarbons (HFCs) in all new refrigeration equipment – this avoids three-quarters of the direct greenhouse gas emissions from their old equipment.

Refrigerant gases represent a big challenge for Coca-Cola, particularly because HFCs form the 'chemical backbone' of most current cooling equipment, and are up to 1,300 times more potent than CO₂ (closest alternative) when used in cooling systems. By the end of 2007, the Company and its bottling partners had deployed more than 8,500 units of HFC-free equipment using CO₂ as the refrigerant. The target for the end of 2008 was to be a deployment of 30,000 units, although it remains uncertain as to whether this has been met to date. The main barrier to uptake has been, up to this point, the cost associated with the newer CO₂ equipment. However, Coca-Cola has made a commitment to purchase 100,000 CO₂ coolers, aiming to create an incentive for manufacturers to increase production, eventually bringing about a price decrease and accelerating a shift towards a new generation of 'environmentally-friendly' coolers. Emissions from transportation remain relatively small – mainly because Coca-Cola's operations are largely local for bottling, production and delivery.

Transportation: Despite having one of the largest distribution systems in the world, Coca-Cola's transportation CO₂ emissions footprint remains relatively low, mainly because their

²¹ Coca-Cola Sustainability Review 2007-08

operations are largely local for bottling, production and delivery. The UK, for example, has 4 or 5 plants and this helps avoiding travelling long distances. However, Coca-Cola has taken actions to address its emissions from transportation. It has been testing fuel reduction possibilities by improving its logistics and teaming up with customers to avoid empty runs. Coca-Cola also continues to use more hybrid passenger cars for its sales staff, and diesel-hybrid electric delivery trucks to bring products to market. Coca-Cola Enterprises Inc. (CCE) – Coca-Cola's largest bottling partner – has worked with suppliers to create a customised diesel-hybrid delivery truck, which converts braking energy into supplementary electrical power. Each of these trucks becomes 37% more fuel-efficient as a result in comparison to the traditional delivery fleet, reducing overall emissions by 32% and producing fewer emissions when idling or stopping in traffic.

Cold-drink cooling equipment: the single largest emission of greenhouse gases from Coca-Cola comes from keeping their beverage products cold. In 2000, Coca-Cola made a commitment to improve the energy efficiency of their cooling equipment by 40-50% by 2010. In 2006, they completed the transition to insulation foam that is free of hydrochloroflourocarbons (HFCs). They are currently developing a proprietary energy management system (EMS) to deliver energy savings of up to 35%.

Water: The Company is currently developing water efficiency targets and wastewater treatment targets. By next year, it aims to ensure all plants worldwide have wastewater treatment – this meets European legal requirements for plants located in Europe, but usually 'goes beyond' the legal requirements of countries outside Europe.

System-wide, Coca-Cola has set itself a goal to offset the litres of water used in their finished beverages (approximately 122 billion litres in 2007) through local projects supporting communities and nature. Coca-Cola also has over 150 Community Water Projects on water resource protection and improving access to clean water in both European and developing countries. A significant amount of work is being done in the Danube area on wastewater and wetlands protection, and water saving education for consumers is being undertaken by the Spanish arm of the Company and bottlers in the region, mainly because of the water stress in Spain. The Company believes it has the marketing and communications materials to improve outreach, and that they need to take advantage of this and their distribution network to communicate important messages to consumers.

8.4.2 External actions and measures

Coca-Cola has collaborated with external partners on a number of issues. They are a part of the Water Footprint Network²², which promotes the transition towards sustainable, fair and efficient use of fresh water resources worldwide. In 2007, Coca-Cola began work with the Carbon Trust to assess the carbon footprint of certain products²³, and is working with the Carbon Trust and industry associations (such as the Union of European Beverages Associations (UNESDA)²⁴ to identify cost-effective opportunities to reduce their footprint. Coca-Cola is also working with WWF on wetland protection, and water stewardship certification with the European Water Partnership (EWP)²⁵ – an independent body which accredits and assesses company operations, and gives certificates to those with plant operations in line with certain sustainable water management criteria. This is a voluntary initiative to ensure Coca-Cola is reaching 'sustainable standards'. The basis for this activity is compliance with the EU Water Framework Directive (WFD) and 'going beyond' these

²² Water Footprint Network - <http://www.waterfootprint.org/?page=files/home>

²³ Carbon Trust and Coca Cola partnership to calculate and publish carbon footprint for various products <http://www.cokecorporateresponsibility.co.uk/carbontrust/index.html>

²⁴ <http://www.unesda.org/>

²⁵ <http://www.ewp.eu/>

legal requirements to see what more can be done to ensure locally sustainable water management in operations – a ‘voluntary add-on.’

8.5 Impact on company performance

Sales and profitability

The impact of these measures on sales and profitability is difficult to quantify. Climate change policies have raised Coca-Cola’s awareness about what more they could be doing. All voluntary measures have been linked to political will and drive, and recognition that climate change is ‘important and that something needs to be done about it.’

An important note to make, however, is that there is currently no financial incentive to become more efficient because prices for resources are considered to be relatively low at the moment – energy costs have fallen over the short-term and packaging is regarded by Coca-Cola as fairly cheap at the moment. ‘Doing the right thing’ and increasing the recycled material content in packaging, for example, has a higher cost associated with it than using entirely new material.

The main driver for taking measures such as investment in renewable energy remains reputational. Proactive engagement in climate change-related policies demonstrates leadership to consumers, which is particularly important to major global brands such as Coca-Cola, and help to signal that the company can be ‘relied upon’. Furthermore, measures taken now reflect Coca-Cola’s policy of ‘hedging their bets’ that consumer behaviour will shift from saving money and obtaining the lowest price to selecting brands based on the company’s actions and their trust in the brand. This is not being seen as yet, but Coca-Cola have ‘taken the risk’ that this behaviour shift will take place in the future.

Impact on investor confidence

This has also been difficult to track, although anecdotal evidence has indicated that the investor community is looking at business risks. This includes to some degree climate change and environmental risks. Again, Coca-Cola are ‘hedging their bets’ that this will become an important driver for investors in the future, and that if they make mistakes now (i.e. not taking actions on climate change policies), they will lose both investors and consumers in the future.

8.6 Impact on jobs and skills

8.6.1 *Impact on jobs*

New jobs have been created in the last few years as a direct result of climate change policy drivers. The interviewee’s own position as Corporate Responsibility Director of Environment is an example of a job which did not exist a year ago. Some technical teams, which usually consist of approximately 3 or 4 persons, have seen almost 2-3 additional new jobs created, which is a significant proportion of new jobs created given the initially small size of the team.

The general impact of climate change policy drivers on jobs has been positive, with both upskilling of existing staff and the creation of new jobs. There have been no observations of job losses or redundancies as a result of climate change policies. New jobs relate to the understanding of strategic political and stakeholder issues, as well as technical implementation. Many people in the business who have traditionally worked in auditing and operation, and technical assessment and monitoring, are now moving towards more environmental monitoring and implementation work. This is a clear reflection of a shift from ‘classic auditing jobs’ towards more technically sustainable and environment-related jobs. The same upskilling shift is taking place amongst the bottling companies.

8.6.2 Impact on skills

One of the key skills required is a much clearer understanding of climate change policies – in terms of where the policy is ‘directing’ the organisation and what the company can do to respond to the policy; not just ‘implementing a rule’. Creative and flexible thinking is required in relation to this. Technical staff also require a much greater understanding of external affairs – in terms of what policy makers and NGOs are thinking, and need to consider the ‘business position’ more than ever before. This is an area which has been identified as ‘struggling’ in some respects. In general, the uncertainty and ambiguity of operating in an ‘unknown field’ has to be recognised as well.

Much of the Coca-Cola training is done ‘on the job’ through coaching and mentoring. As well as upskilling existing staff, people have been recruited from external sources because they possess the ‘ideal skillset’. More generically, an internal initiative called the ‘Environment Academy’ exists – allowing for any employee within the business to become informed on what the company is doing in relation to climate change and to see what they can do to contribute to actions, and the impact of their day-to-day decisions on the environment. One example is packaging designers getting briefings from the Academy on certain issues and designing lighter packaging which accounts for this. There are several other ways in which staff are educated about environmental issues – these include reports, intranet, activities within the office and ‘Green Teams’ – people who do an assessment of the environmental performance of their office.

Coca-Cola has also worked with WWF to create a toolkit to help their bottling partners to understand how their water use tracks with best practices within the business system. Based on this knowledge, numerous facility-specific ways are shared with the bottling partners to continue to improve water use efficiency.

According to the CERES company profile on Coca-Cola, Coca-Cola also collaborated with WWF to co-host seven Greenhouse Gas Mitigation Strategy workshops for key bottling partners around the world in 2006 and 2007. The company also offered energy efficiency training sessions on five continents and continues to make these training materials available for on-going local sessions.

8.7 Future implications of climate policy drivers

8.7.1 Increased stringency of existing climate change policy drivers

It is logical to assume that climate change policy drivers will impact on costs, and will lead to more scrutiny on the ‘right behaviour’ of big companies and their voluntary actions and thinking. The Clean Development Mechanism provides companies such as Coca-Cola with an opportunity to lead more creatively where they can reduce carbon emissions. The CDM can provide opportunities to make greater emission reductions in developing countries with a given amount of money. This is important as carbon emissions reductions anywhere in the world will help reduce global warming, as it is a global phenomenon rather than a regional phenomenon.

8.7.2 Implications of new climate change policy drivers

An EU-level low carbon energy policy would make a significant difference to companies such as Coca-Cola. Currently, it is estimated that around 90% of Coca-Cola’s carbon emissions is directly linked to where it has obtained its energy from. Coca-Cola’s Scope 1²⁶ emissions – its direct greenhouse gas emissions is relatively small and is generally from the use of their fleet of trucks, offset in part by the production of their own renewable energy or use of Combined Heat and Power (CHP) plants. However, the biggest ‘chunk’ in terms of emissions is Scope 2 and 3 emissions – such as energy purchased off-site to produce their

²⁶ WRI/WBCSD GHG Protocol – most widely used international accounting tool for government and business leaders to understand, quantify and manage greenhouse gas emissions www.ghgprotocol.org

beverages and other products. This is obtained all from external energy sources, and as a result, the emissions of a plant in the UK or Germany, will differ significantly from say, France, because they are heavily dependent upon how the energy has been produced. As a result, a product in the UK and Germany that is practically identical to a product in France will have a much higher carbon footprint than France because France's energy source is largely nuclear. This creates an 'uneven playing field', and is likely to encourage moves by certain countries to gain competitive advantage – for example, a scenario could be the UK bottling company producing all its products in France and transporting them back to the UK, in order to reduce its carbon footprint. An EU carbon-based energy market is therefore seen as a possible solution to this.

8.8 Lessons for other companies and sectors

One recommendation for companies is to have a 'clear look' at what the main environmental impacts are, where they are and how big they are. It is then useful to break these down into 'edible chunks' in order to deal with them effectively – e.g. energy, water and packaging – and then to address each of them individually and to see what targets and commitments can be set in relation to each of these.

Other leading brand manufacturers have been known to be taking similar measures to Coca-Cola, although Coca-Cola consider themselves to have taken a fairly unrivalled, aggressive approach to water issues – a decisive stance which no other company appears to have 'taken as seriously'. Coca-Cola would consider itself to have a position of leadership in this area.

In terms of carbon, their commitment to *absolute* emissions targets and not just relative targets (e.g. per litre produced) has been viewed by them as a very distinctive way of approaching the issue, and not many other companies appear to have taken this level of commitment as of yet. Coca-Cola's drive to achieve HFC-free cooling could dramatically change the commercial market if they can 'crack the innovative technology' required for this. In this respect, Coca-Cola views itself as again taking a leadership role and volunteering to 'put its foot in the water and take the risks first' – however, there is still 'much to be done' in this area - particularly as there are approximately 4 million coolers in the market and only 15,000 new coolers are HFC-free. Coca-Cola is driving moves towards increasing this percentage.

However, one major barrier towards developing innovative technology to reduce the carbon footprint is the cost implication of doing so, which remains significant. Coca-Cola believes that more financial incentives need to be introduced in order to allow them to take more commercial risks – and policy needs to take account of this. Tax breaks for environmental investments have been used as one possible measure in the past, but 'more needs to be done' to incentivise positive actions – *'work on the carrot, not just the stick'*.

9 CASE STUDY 7: CADBURY

9.1 Summary

Cadbury is a global confectionery company, with operations in over 60 countries. As part of its 'Sustainability Commitments', Cadbury aims to reduce carbon, packaging and water use, and in 2007 launched their 'Purple Goes Green' campaign, which sets out the company's strategy for minimising their environmental impacts. The strategy set several targets to achieve this, with the most significant one being a commitment to a 50% reduction in absolute carbon emissions by 2020.

The main drivers for reduction in carbon emissions are to maintain the company's long-standing culture and image of being committed to environmental principles, and to retain customer loyalty to the brand. The company sees itself as setting a position of 'leadership' in terms of setting ambitious targets to reduce emissions, with the aim of influencing other competitors in the sector to take similar initiatives, as well as influencing behavioural change amongst its consumers. Cadbury is currently undertaking several initiatives across a range of global locations to reduce its carbon footprint. These include:

- Changing all electricity used by Cadbury in Ireland in 2007 to power provided by wind turbines
- Investing in new technologies such as combined heat and power (CHP) plants where appropriate, such as in the US, Japan and Poland

Company performance has not been affected by climate change policies. Cadbury believes its carbon management strategy places the company in a strong position to mitigate the impacts of new regulations and to take advantage of possible opportunities to generate revenue from instruments such as the EU Emissions Trading Scheme, by being net sellers.

Climate change policies appear to have impacted both jobs and skills within the company, although largely in terms of compliance. In terms of jobs, the company has witnessed a significant growth in the last few years of the number of external environmental consultants it has hired to do work such as verification and providing specialist expertise on renewable energy and technologies such as CHP. This has impacted the skills agenda within the company, and Cadbury has strengthened its efforts to internally train its staff to build its skills and capabilities in these areas, in order to reduce the company's dependence on external consultants, which can be extremely costly to the company.

The company is confident that consumers are likely to be more environmentally-conscious in the future and that the environmental responsibilities of a brand is likely to be a strong factor in influencing consumers' purchasing decisions. Cadbury has assumed a 'leadership' role in setting voluntary targets to reduce its emissions, such as significantly reducing the amount of packaging it uses for its products, and hopes to 'set a standard' for other competitors in the sector to make similar efforts.

9.2 Introduction

Cadbury is one of the world's biggest confectionery companies, with over 10% of the market share according to its latest Annual Report and Accounts²⁷. Founded in 1824 by John Cadbury in Birmingham, the United Kingdom, the company now operates in 60 countries, and makes and sells three kinds of confectionery – chocolate, chewing gum and candy.

Cadbury works with approximately 35,000 direct and indirect suppliers and employs over 45,000 people worldwide. In 2008, revenue totalled £5.4 billion and underlying operating

²⁷ Cadbury, Annual Report and Accounts (2008) 'Focused on Performance: Delivering against our plan'

profit was £638 million. In 1969, Cadbury merged with Schweppes – a leading beverages brand. This venture was aimed to give better value to the customer, boost its foods arm and gain the resources to enter international markets. Cadbury and Schweppes demerged in 2008, splitting its confectionery and drinks business.

Cadbury has a long history of good corporate social responsibility, dating back to the beginning of the last century. According to the interviewee, the company was founded on Quaker principles, and Cadbury considers itself to have historically ‘in-built’ social and environmental values into their business culture and way of working – also referred to as ‘changing visions and constant values’. In 2007, Cadbury launched its environmental initiative – ‘Purple Goes Green’ – with headline commitments to reduce carbon emissions by 2020.

9.3 Key climate change policy drivers for change so far

The key climate change policy drivers for Cadbury are the following in order of importance:

1. Company initiative

Cadbury’s environmental agenda – Purple Goes Green - set new targets in energy, packaging, water and advocacy, to build on commitments made in their 2006 CSR report (which committed to developing a reliance on renewable energy, reducing carbon based fuels and using 100% recoverable or biodegradable packaging). Purple Goes Green is also based on a recognition of the potential business opportunities and benefits of acting early on climate change. Cadbury has traditionally had a ‘culture’ of environmental management, which it has seen as ‘naturally the right thing to do’ for larger, global companies such as itself, as opposed to smaller companies, which generally are perceived to react more to policy drivers than taking proactive actions on their own initiative.

The Company does not consider itself to be a major emitter of greenhouse gases directly, despite being a major global confectionery brand. Cadbury’s Carbon Disclosure Project (CDP) response suggests that around two thirds of the company’s footprint is from Scope 2 emissions, i.e. consumption of electricity. According to the interviewee, the biggest source of emissions for Cadbury is in Scope 1 and 2 emissions – namely internal operations using equipment such as refrigeration; air conditioning; the use of computer systems and steam used for cooking, cleaning and boiling in food factories.

According to the same CDP response, Cadbury believes that their most significant Scope 3 emissions arise in the production of their ingredients, particularly milk. This is due to the methane released during ruminant digestion. In 2007-08 in partnership with the Carbon Trust (UK), Cadbury calculated the carbon footprint for the ‘lifecycle’ of Dairy Milk chocolate bar (and other flagship Dairy Milk products) and found that milk contributed to just over 60% of supply chain emissions.

Sugar production is also likely to be a significant source of Scope 3 emissions for candy products, and similarly the production of components of gum base in chewing gum production. Goods transport and business travel are both also cited as other significant Scope 3 emissions, and at the time of the CDP response, more accurate data on these emissions was being gathered.

Comparatively speaking, emissions from Cadbury are believed by the company to be small, and much of Cadbury’s initiatives to reduce their carbon footprint appear to be voluntary.

2. Reputational risk

‘Changing visions’ is considered to be very important to the company. Cadbury considers its commitment to reduce carbon emissions by 50% by 2020 to be very ambitious compared to any target imposed by either domestic or international policy, and see their actions as being driven largely by a willingness to ‘take a leadership position’ in the market, and to take an approach of advocacy in terms of influencing policy makers and other competitors in the market to ‘do the right thing’.

Cadbury have undertaken a significant amount of market research in recent years, assessing third party data and whether consumer behaviour is driven by 'environmentally-friendly products' or an 'environmentally-conscious brand'. The company sees this group of consumers – those with an 'environmental conscience' – as a growing part of the market, and therefore want to retain their loyalty by being seen to be 'doing the right thing' without alienating the major consumer group – which is best characterised as those consumers who will opt for the environmentally friendly option if there are no cost implications. Through their actions to reduce their carbon footprint, Cadbury also see a role and opportunity to change consumer thinking.

3. Regulatory risk – or opportunity?

An ever increasing amount of new legislation (both non-EU and EU) is likely to be introduced, leaving a risk of statutes overlapping and potentially conflicting, making compliance more difficult and costly. The largest regulatory risk potentially arises from the indirect impact of new legislation, such as the pass-through of EU ETS compliance costs from power generators leading to increasing energy prices and the impact on commodity prices of legislation around biofuels. Cadbury's 2008 response to the Carbon Disclosure Project Questionnaire (CDP6)²⁸ stated that recent EU and US biofuel legislation had already had a 'tangible impact on corn prices, which had been passed through the supply chain via the cost of corn derived sugar syrups and similar pressure is expected on vegetable oil and sugar prices'.

Although policy and legislation rates fairly lowly in terms of drivers of overall goals and ambitions in comparison with reputational risk and company initiative, Cadbury maintains that policy remains important in terms of impacting **how** Cadbury achieves these targets. EU legislation or international agreements which result in subsidies for technologies, or grants for 'choosing a particular route,' can strongly influence the path taken by the company. One example cited by the interviewee was that of the 10% target for use of biofuels in transport fuels by 2020²⁹ set out in the EU's Renewable Energy Roadmap in 2007.

A growing number of the countries in which Cadbury operates now are currently or will shortly be participants in carbon trading schemes, in line with the Kyoto Protocol, and by adopting an 'aggressive' stance to reducing carbon emissions early, Cadbury believes they will place themselves in a valuable position to take advantage of such schemes to generate additional revenue. Similarly, many national bodies are offering an increasing number of tradable commodities, such as certificates of origin (ROCs³⁰ in the UK for renewable power, for example) which could have an 'inherent value and provide valuable funding streams for alternative energy across Cadbury's portfolio.'³¹

²⁸ Carbon Disclosure Project (CDP) is an independent not-for-profit organisation which holds the largest database of corporate climate change information in the world. The data is obtained from responses to CDP's annual Information Requests, issued on behalf of institutional investors, purchasing organisations and government bodies.

²⁹ COM(2006) 848 final 'Renewable Energy Road Map - Renewable energies in the 21st century: building a more sustainable future'

³⁰ ROCs (Renewable Obligation Certificates) store details of how electricity was generated, who generated it, and who eventually used it. All UK-licensed electricity suppliers are obliged to obtain a proportion of the electricity they sell from a selection of eligible renewable sources such as wind and solar power. For every 1,000 units (1MWh) of green electricity an energy company generates they receive one ROC. A company that generates more than its renewable obligation can sell ROCs to energy suppliers who have failed to meet their RE obligation, providing a financial motivation to invest in renewable energy generation projects.

³¹ CDP6 response

4. Physical risk

Changes to rainfall and water availability as a result of climate change are likely to have the most significant impact as far as physical risks are concerned. Water remains a key resource for Cadbury's manufacturing processes – it is used in cleaning, cooling, as a process aid (e.g. dissolving etc) and as an ingredient. It remains unclear what the precise impact of climate change will be on the crop yields of other key ingredients of Cadbury's products – sugar, cocoa and milk. However, droughts occurring in Australia have already been seen to have led to significant price increases in milk, as a result of reduced availability.

9.4 What has the company been doing so far?

Although Cadbury does not consider itself to have any specific 'CO2 hotspots' in terms of critical areas of the business having high levels of carbon emissions, it has focused a wide range of voluntary initiatives and targets in specific areas - energy, packaging and water.

9.4.1 Internal actions and measures

As mentioned above, 'Purple Goes Green' sets specific targets for energy, packaging and water (as well as advocacy). These targets were developed following advice from Forum for the Future, a sustainable development charity in the UK, and are intended to be a response to Cadbury's increased understanding of the challenge of climate change.

Energy

Cadbury aims to achieve a 50% reduction in absolute carbon emissions by 2020, through a combination of activities, known in short-form as 'save, switch and offset'³². This refers more specifically to:

- Save energy:
 - Minimise the use of energy by improving processes and efficiency
 - Install CHP/co-generation to optimise total energy requirements
- Switch to more environmentally-friendly energy forms:
 - Switch to low or zero carbon fuels
 - Purchase electricity on renewable energy tariffs
 - Install 'renewable energy' generation on-site (solar, wind, biofuel)
- Offset by incentivising saving and switching by others – i.e. counter balance or compensate for emissions through funding reduction projects carried out by others. These typically may include investing in renewable technologies to compensate for the greenhouse gases produced:
 - Purchase carbon offsets or buy (and retire) carbon credits for any remaining carbon emissions. Preferred as an 'option of last resort.'

By the end of 2007, Cadbury had reduced its carbon emissions by 3% compared with 2006 – equivalent to almost 24,000 tonnes.³³ It also estimates it will achieve a 10% reduction by 2010.

In terms of operational efficiency, Cadbury also put in place an automated monitoring and targeting system in global locations to view data directly from meters and identify opportunities for energy reduction and tracking energy and water use over time. Energy actions resulting from this data collection have included:

³²Cadbury 'Purple Goes Green' vision statement:
http://www.cadbury.com/SiteCollectionDocuments/Purple%20Goes%20Green%20-%20Our%20Vision_Final.pdf

³³ excludes Americas Beverage business

- Changing all electricity used in Ireland in 2007 to power provided by wind turbines, reducing carbon emissions for the Irish business by almost 40%
- Launching the largest rooftop solar installation in New South Wales, Australia on their Huntingwood factory in 2008. The system consists of 640 solar panels and is capable of producing enough energy to power 21 homes while saving 140 tonnes of greenhouse gas emissions, or the equivalent to taking 35 cars off the road³⁴
- Investment in new technologies where appropriate (and readily available technology), such as combined heat and power (CHP) plants in the US and Japan, and projects to install CHP at a number of larger sites in the UK, Europe and Africa
- CHP plant powered by biogas in Poland to 'exploit subsidy opportunities arising from EU policies', despite Cadbury remaining relatively sceptical about the potential of first-generation biofuels.
- Use of bagasse from the local sugar industry in sites in India to fuel boilers on site and solar heat to generate hot water for use in kitchens and amenities in a site in Brazil

Cadbury's viewpoint is that regulatory requirements can potentially offer opportunities and not just risks. Some corporate decisions are driven by the 'added bonus' that EU policy can provide for certain sectors – for example, if two sites yield similar energy savings but one also benefits from the EU Emissions Trading Scheme (EU ETS), this can help to sway investment decisions in favour of the site which has 'additional benefits' as a result of legislation. Cadbury has seven sites subject to the EU ETS, and according to the CDP6 response, intended to be net sellers by the end of Phase II.

Packaging

Packaging remains important to Cadbury in terms of maintaining the quality of its products, through the prevention of damage to them and through the reduction of food waste. However, Cadbury aims to achieve a 10% reduction in standard product packaging and a 25% target for seasonal and gift ranges, as well as 60% biodegradable packaging including paper, board and biodegradable plastics. Although Cadbury is making efforts to reduce its carbon footprint in other areas, packaging remains an important area particularly to the consumer – because a reduction in packaging is 'visible at the point of sale', as opposed to achieving reductions in other aspects of the company's activities.

In the last three years, Cadbury has achieved double-digit reductions in the packaging used on seasonal products such as Easter eggs, which traditionally have carried a significantly higher amount of packaging in comparison with other competitors' products. Cadbury has achieved the production of a box 25% smaller in size, with the same-sized chocolate eggs and bars, and has focused on redesigning the plastic that holds the egg to reduce the amount of plastic used. According to the 'Purple Goes Green' statement, Cadbury also reduced the amount of plastic casing in small and medium sized Easter eggs, saving 202 tonnes of plastic (the equivalent of 4.8 million PET bottles).

'Naked eggs' have also recently been released as a gift proposition. An important balance needs to be made however, between maintaining the 'gift experience' whilst simultaneously reducing the amount of packaging used on the product.

Water

In recognition of the potential risk faced by the business due to changes in precipitation and current water stress around the globe, Cadbury has implemented a programme of water management, with an initial focus on sites in water scarce areas such as Australia. The

³⁴ Cadbury 'Purple Goes Green' vision statement

target set by Cadbury here is to ensure 100% of all 'water scarce' sites have water reduction programmes in place. Such programmes focus on minimising water use, switching to more sustainable sources of water and recycling water on site. Between 2006 and 2007, Cadbury reduced its water consumption by 10%.

The Asia Pacific region is leading activity in this area and is helping the company to inform wider development, adopting a target of water neutrality at manufacturing sites. In Australia, the goal for factories is to achieve water neutrality through careful water management – this includes reducing water use as well as capturing and treating waste water and condensate.

Advocacy and culture change

One of the Purple Goes Green targets also relates to campaigning for change with colleagues, suppliers, customers, peers, civil society and consumers. Cadbury considers advocacy and awareness raising – both within the company and in the wider public – to be central to meeting environmental commitments.

Cadbury has established a 'culture change' programme in order to create environmental awareness amongst colleagues at all levels of the organisation. This is being led by so-called 'green advocates', employees committed to raising awareness levels within their sites through information sharing and other various tools. Key benefits of this 'cultural change' have been identified as being:

- An openness to change amongst employees
- Reductions in waste and consumption in sites where awareness campaigns are run e.g. a reduction in the paper ordered by 25% in the Cadbury US office as a result of an awareness campaign
- Strengthening of employee commitment and loyalty

9.4.2 External actions and measures

Cadbury has collaborated with external partners on a number of issues. They are a part of the Water Footprint Network³⁵, which promotes the transition towards sustainable, fair and efficient use of fresh water resources worldwide. Cadbury has also signed up to the CEO Water Mandate³⁶ and is part of the Courtauld Commitment³⁷, a UK waste reduction initiative. Cadbury is of the opinion that certain issues tend to be more effectively dealt with on a national level than global, and hence is willing to participate in several agreements at a national level as well. Another example is the Cadbury's UK arm's national agreement with Biffa – a leading waste management company in the UK – to amongst other things, obtain advice from Biffa on how to increase recycling rates. Cadbury also has longstanding relationships with a number of environmental consultancies.

The company is also in several partnerships with retail customers and sits on several panels of food and drink associations, such as the Food and Drink Federation (FDF), IGD³⁸ and Confederation of the Food and Drink Industries of the EU (CIAA). Cadbury is also in an 'unofficial partnership' with WWF, who through personal relationships with the company, offers them advice on certain issues.

³⁵ Water Footprint Network - <http://www.waterfootprint.org/?page=files/home>

³⁶ Launched July 2007, it is designed as a private-public initiative with a focus on developing strategies and solutions to contribute positively to the emerging global water crisis. It seeks to engage a critical mass of companies from around the world, willing to undertake serious efforts, in partnership with other stakeholders, to address this challenge.

³⁷ voluntary agreement between WRAP and major UK grocery organisations that supports less packaging and food waste ending up in household bins

³⁸ UK-based think-tank and research organisation for the grocery sector formerly known as the Institute of Grocery Distribution

Cadbury also used dairy consultants to investigate how to reduce the carbon footprint of dairy farmers in the UK (see above), as part of Cadbury's Dairy Strategy, and shared findings of the factors that contribute to carbon emissions from milk production with external stakeholders such as Business in the Community (BITC) – a UK membership organisation which mobilises business to 'improve their positive impact on society'³⁹ – and Asda – a leading supermarket chain in the UK.

Supply chain

In 2007-08 in partnership with the Carbon Trust (UK), Cadbury calculated the carbon footprint for the 'lifecycle' of Dairy Milk chocolate bar (and other flagship Dairy Milk products) and found that milk contributed to just over 60% of emissions. Since then, Cadbury has worked with dairy farmers in the UK to develop a Cadbury Dairy Strategy to help reduce the environmental impact of dairy farming. Central to this was the production of the Cadbury Guide to Low Carbon Dairy Farming – a best practice guide distributed to dairy farmers, providing an overview of the factors that contribute to carbon emissions from milk production and practical measures that farmers can implement to reduce them. Although this has been a purely voluntary initiative for the farmers, feedback on the scheme has been 'exceptionally positive' according to the interviewee, possibly because participating in such a scheme is likely to increase profitability for farmers and 'make good business sense'. Investigation of best practices showed that good agricultural practice made significant impacts on carbon emissions – for example, good slurry management instead of fertiliser use was seen to reduce nitrous oxide emissions from cows. Similarly, efficient energy use in tractors and vehicles also made a significant difference to carbon emissions.

Cadbury intends to repeat the carbon footprint exercise undertaken with the Carbon Trust in relation to other products such as high boiled sugars, chewing gum and jellies, and findings from these surveys will determine Cadbury's future actions in these areas. The company is also investigating the agricultural supply chain to better understand the impacts of climate change, although this work is still far from completion.

Cadbury is also working to achieve sustainably grown ingredients – the Cadbury Cocoa Partnership invests in developing countries to improve farming methods, increase education and develop community structures, allowing better trading deals for cocoa producers. This enables village resources in countries such as India, Ghana and the Dominican Republic to 'work together for the communal good' and to grow cocoa sustainably, for example by use of natural methods such as insects instead of pesticides.

9.5 Impact on company performance

Impact on sales and profitability

Cadbury takes the view that its sales and profitability are unaffected by climate change policies.

Impact on investor confidence

Companies with a 'certain set of values' are likely to be more attractive to investors, who are likely to be motivated not just by generating cash, but also by investing in a company with a set of values instilled within their brand. 'Taking the lead' is also seen as important to investors, who are likely to be keen to see companies being 'on the front foot with all issues' and prepared for any significant impacts to the business, and in this sense, Cadbury feels it is well-positioned to retain investor confidence.

³⁹ http://www.bitc.org.uk/about_bitc/index.html

9.6 Impact on jobs and skills

9.6.1 Impact on jobs

The increasing emphasis on the climate change agenda and related policies has, in Cadbury's opinion, resulted in a growing marketplace for consultancies offering specific services. These services could include, for example, undertaking feasibility studies for CHP plants, or the design, building and operation of wind turbines. Cadbury is commissioning a growing body of these external consultants – 'buying in but not retaining them on the payroll'.

The increasing use of verifiers – who act as an independent body to check the accuracy of figures submitted by the company to the EU ETS policy and give statements to verify this – has been cited by Cadbury as perhaps directly attributable to EU policy. Cadbury has identified that a significant amount of work has been created for verifiers as a direct result of the EU ETS – largely because 'everyone has to be verified'. Similarly, environmental management standards such as ISO 14000 and Eco-Management Audit Scheme (EMAS) also require certification and are driving a demand for services in this area. Calculating the carbon footprint of products also requires verification and is likely to create 'more work' for consultancies, as well as expertise in 'green technology' such as CHP, wind energy and biomass.

9.6.2 Impact on skills

The increase in the demand for external consultancy services has led Cadbury to develop an ambition to reduce their reliance on external consultants for 'basic technical advice', and to build up a wide range of knowledge within the company. Internal personnel – specifically those with job titles that include the terms 'energy' or 'environment' – are being encouraged to build capabilities and to 'upskill'. Cadbury has started this process, creating tools, training packages and systems to allow knowledge and best practice to be shared. Specialist modules have been created to fill identified gaps, and the intention is for staff across the globe to access these modules electronically and to reach a certain level of knowledge. External training providers are rarely brought in, mainly due to the expense associated with buying in these services for a company as large and global as Cadbury – and it is considered more cost-effective to develop in-house training across the board.

Cadbury's culture change programme has a specific programme of work to develop sustainability leadership capabilities. A bespoke 'Building Sustainability Leadership' Development Programme was designed along with Forum for the, and the first pilot was attended by over 30 participants from different functions across the globe. A new role of Sustainable Business Practices Manager within the Corporate Responsibility team was also created to roll out the programmes and to tailor content to geographic and specialist functional interests (e.g. marketing, supply chain, science and technology) in order to maximise positive impacts⁴⁰.

Cadbury is keen to develop knowledge internally on more technical areas such as conducting energy audits – areas which Cadbury has in the past, commissioned externally, and which it is confident can be undertaken by its own staff with the right level of training and appropriate materials. The company is keen to develop workers' skills to have 'more intelligent conversations' about specialist areas such as Combined Heat and Power (CHP), and to be able to spot opportunities to drive the business forward rather than rely on external assistance. The main benefit to the company in this respect would be a commitment to 'growing and developing people' and to ultimately reduce reliance on external services.

⁴⁰ Cadbury 'Purple Goes Green' vision statement:

http://www.cadbury.com/SiteCollectionDocuments/Purple%20Goes%20Green%20-%20Our%20Vision_Final.pdf

9.7 Lessons to be learnt both specific and non-specific to the sector

Cadbury considers it highly 'presumptuous' to consider that other companies and sectors would necessarily have 'lessons to learn' from its own actions, but does believe that is important to take the initiative to put the company in a 'leadership position' and remains proud of its relatively unique commitments to absolute reductions in carbon emissions.

10 CASE STUDY 8: MARKS AND SPENCER

10.1 Summary

Marks and Spencer (M&S) is a large UK retail company specialising in food, clothing and homeware, with stores in the UK and internationally. In 2007/2008, total turnover was £9,022 million. Worldwide, the company employs 75,000 people and has 900 stores (622 in the UK, 278 internationally).

M&S aims to be a leader in sustainable development, which it intends to achieve through its 5 year “eco-plan”, Plan A⁴¹. Carbon reduction is one of the 5 areas covered by Plan A. Its headline target is to be carbon neutral by 2012 with minimal offsetting. A Plan A team has been set up to work with each area of the business. The Climate Change policy response is driven from the top by the Chief Executive. He is also the Chair of the CSR (Corporate Social Responsibility) Committee, which is composed of senior business leaders. The Plan A Director also sits on the CSR Committee, which meets once a month. Plan A champions, whose role is to keep colleagues updated and find innovative ways of implementing Plan A, have been appointed in each store.

The company has achieved or is in the process of attempting to meet several targets to reduce its carbon impact. The drivers for this are a mix of climate change policies, but also other factors such as customer expectation and high energy prices. However, this demonstrates that carbon pricing at the appropriate level could lead to increased efficiencies. It is not clear at the moment whether this would have an effect on jobs. The many and complex factors make it difficult to attribute actions to climate change policy drivers explicitly.

Reducing the carbon footprint of M&S's own stores and operations through increased energy efficiency is a key aspect of achieving its Plan A goals. Several pilot eco-factories have been set up to test new methods of reducing energy use. In addition, M&S recently signed the UK retail sector's biggest renewable energy contract. The six year deal will ultimately provide enough power for all the M&S stores and offices in England and Wales. The contract allows for 20-30% of the power to be purchased directly from small-scale independent producers, many of whom are farmers who are thus able to supplement their income and safeguard their livelihoods.

Around 75% of the carbon footprint of clothing occurs during the use phase of the product. M&S, with The Climate Group, set up an awareness-raising campaign for customers to reduce the washing temperature of their clothes. This has so far resulted in a saving of 25,000 tonnes of CO₂ annually.

M&S have worked closely with many organisations on climate change such as the Energy Savings Trust, the Carbon Trust, WWF, Greenpeace, Oxfam and others. The Chief Executive sits on the UK Government business council and advises on climate change in the context of consumer behaviour.

Moving to lower emission gases used in refrigeration is driven by climate change policy and has an impact on skills. M&S was involved in the training of 100 engineers who did not have the required skills to implement the changes.

Climate change policy drivers have had an impact on the skills required for the construction of “green” stores and implementation of these innovations in existing stores. M&S created a Sustainable Construction Manual to improve the skills of contractors, as these were perceived to be inadequate.

⁴¹ Plan A details can be found at <http://corporate.marksandspencer.com/howwedobusiness>

Overall, the response to climate change policy drivers seems to have had a very small impact on direct employment by the company. The implementation of Plan A has led to an additional 20-30 specialised jobs within M&S. Although important, the numbers are not significant compared to the total number of employees (75,000).

Indirect effects from M&S's drive to reduce its carbon footprint are probably more significant for its suppliers, by maintaining and/or creating additional jobs. Companies like M&S can provide leadership for change, which will have an impact on the supply chain. This is where retail companies are likely to have the most impact on employment and skills.

M&S's actions have had a more significant effect on skills, both within the company itself and indirectly on contractors. The company provided assistance in training where skills were seen to be lacking. Through its Supplier Exchange initiative, it encourages suppliers to exchange best practice, invest in their workforce and become more innovative. In addition, it has created the drive for suppliers to innovate by awarding contracts for local renewable energy and recycled carrier bags, for example.

The expected tightening of climate change regulation in the future is a factor in M&S wanting to become carbon neutral.

10.2 Introduction

M&S is a large UK retail company selling food, clothing and home products, with stores in the UK and internationally. It is the largest clothing retailer in the UK, with a value market share of 11%.

Worldwide, the company employs 75,000 people and has 900 stores (622 in the UK, 278 internationally), with 2000 suppliers globally, and 20,000 farmers locally and internationally. Food makes up 51.1% of the business, clothing and home the other 48.9%.

In 2007/2008, total turnover was £9,022 million, up from the previous year. Profit for the same period was £1,007 million.

In 2007, M&S launched their green campaign, Plan A. This is a business-wide £200million "eco-plan" which details 100 separate commitments which the company are aiming to meet within 5 years. This includes specific action on climate change. The headline targets for 2012 are:

- Become carbon neutral with minimal offsetting
- Send no waste to landfill from its operations
- Extend sustainable sourcing
- Set new standards in ethical trading
- Help customers and employees live a healthier lifestyle

So far, 20 of the plan's commitments have been completed and a further 75 are underway.

10.3 Key climate change policy drivers for change so far

Five reasons why M&S is responding to climate change policy drivers:

1. Reputational risk

Customers expect and want M&S to take the lead in this area and manage their impacts. Customers expect large high profile companies like M&S, and the government, to take the lead in bringing issues to the fore. The company believes it needs to be proactive in doing this.

2. Company initiative

- Efficiency savings: both in their own operations and the supply chain. This includes building and management of stores, warehouses and factories.

- Future-proofing the business: Supply chain ahead of the curve, awareness of new technologies. M&S has the sense that there will be more legislation in the future which they will need to take into account and incorporate within the business. Examples include the tax on air freight, carbon emission reduction targets and use of refrigerants such as HFCs (hydrofluorocarbons - powerful greenhouse gases with long atmospheric lifetimes). There is the anticipation that requirements will tighten.
- Motivation and engagement of employees, customers and suppliers: action on climate change and the environment seems to generate better engagement by staff and helps maintain/increase customer footfall.
- Adapting to carbon pricing: any climate policy on agriculture, for example, is likely to have an indirect effect on M&S through pricing and availability of products.
- Strength of competition outside the EU: the drivers of change which the company is competing against are not necessarily climate change policies. Higher energy prices outside the EU act as an incentive for change.

3. Regulatory risk

- This includes the UK Government's Climate Change Act, which aims to achieve at least an 80% reduction in carbon dioxide emissions by 2050 compared with 1990 levels; and the introduction of the UK Carbon Reduction Commitment, the government's proposed carbon trading scheme for organisations such as retailers, in 2010. This will include metered electricity and gas used by M&S's building estates. After an initial three years of trial runs, a 'cap and trade' system is planned to be in place for 2013. The UK Government renewables strategy is also a factor in influencing what M&S's future actions are likely to be. The company perceives that the regulatory risks are likely to increase in the future.
- In the longer term, M&S believe that other sources of CO₂e emissions, such as transport and refrigerant gases, will also be captured by mandatory trading schemes.

4. Physical risk

- Physical risk is part of managing the business sensibly. M&S believe that its assets are currently exposed to a low-level of risk from climate change. These assets mainly comprise M&S stores situated across the UK and Republic of Ireland, which can be subject to infrequent and isolated extremes of weather, such as the localised flooding experienced in Gloucestershire, Oxfordshire and Yorkshire (UK) during 2007. In these circumstances, the main commercial risks are often associated with employee and customer access rather than actual damage to the stores themselves.
- Flooding also has an added impact and increased risk to the suppliers. Any product which is connected to water such as agriculture (food) and textile production (cotton) has an increased risk of physical impact from climate change.

5. Litigation risk

Litigation risk is not currently seen as important but this may become more so in the future.

Whether these drivers are more significant than competition and globalisation in driving restructuring is not easy to answer. Competition does play a key role and in recent times, competition on the high street has become more difficult. M&S believe that brands need to be able to differentiate themselves to raise their profile.

Energy prices do have a significant impact on the cost of purchases. However, it is not clear whether climate change policy is the primary driver for the changes brought about by high energy prices. For example, M&S have a factory in Sri Lanka, where energy tariffs have increased by 40%. As a result, the supplier, with help from M&S, has increased efficiency at the factory to compensate for this. Trade tariffs appear to have more impact

on the price of products (at the moment) than climate change policy. However, the improvement in energy efficiency indicates that future price hikes directly attributed to carbon costing would have a (significant) effect on energy efficiency and how retail companies operate their businesses.

The overall main policy driver for M&S in the UK was considered to be the UK's Carbon Reduction Commitment.

10.4 What has the company been doing so far?

10.4.1 Internal actions and measures

M&S has looked at where its carbon footprint could be reduced across its three main areas of activity:

M&S own operations

M&S commissioned an environmental consultancy to advise the company on how to calculate its operational carbon emissions using the World Business Council for Sustainable Development's (WBCSD) Greenhouse Gas Reporting Protocols⁴². M&S is currently looking at the potential for reducing carbon emissions from its own operations. The strategy is to look at existing technology abatement processes and assess how reduction could possibly be achieved in the most cost-effective manner. Efficiency is a big area to focus on as there is a potential to achieve substantial results with minimum effort.

- **Construction:** M&S had one of the largest construction programmes in the UK last year. M&S has a policy through Plan A to ensure that all new stores adhere to sustainable construction requirements, as set down in its Sustainable Construction Manual. The main barrier to achieving the sustainable construction requirements was the lack of skills in that area. M&S organised conferences and put out manuals and learning documents in an effort to upgrade these skills.
- **Methods and technologies of production:** M&S is focusing on energy efficiency. The company, with its suppliers, has opened 3 pilot clothing eco-factories (2 in Sri Lanka and one in Wales). These have been set up to understand better where the greatest efficiencies can be made with the lowest pay-back time. For example, lighting and insulation were found to have a 2 year pay-back time. The focus has been on sharing these findings with other factories. However, the differences in methods of production are a barrier in applying the lessons learned across all manufacturing operations. Food production presents different challenges, so it is not always obvious how the benefits can be shared widely across the different factories.
- **Refrigeration:** M&S is currently converting from HFC gases to lower emission refrigeration gases. As this initiative was being rolled out, the company found that there was a lack of knowledge in the area. M&S co-funded the training of 100 refrigeration engineers in partnership with other organisations.
- **Product requirements/specs:** at the moment, it is considered that there is not enough information about the carbon footprint of specific products to label products according to their carbon impact. The measurements are very complex and not clearly understood (e.g. a product could have a lower carbon footprint but perform worse in terms of biodiversity).

Customer care

Around 75% of the carbon footprint of clothing can result from customer care – that is the washing, drying and ironing of clothes after they have been bought. Together with the Climate Group, M&S put in place a major educational campaign to try to reinforce the

⁴² This is a widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions. <http://www.ghgprotocol.org/>

message that 75% of their clothes ranges can be washed at 30°C. The “Think Climate Wash at 30°C” labels have resulted in a 15% increase in customers washing at the lower temperature, saving 25,000 tonnes of CO₂ annually.

Internal Management

The climate change policy response for M&S is driven from the top by the Chief Executive, Sir Stuart Rose. He is also Chair of the CSR Committee, which meets once a month and is composed of senior business leaders. The Director of Plan A is a member of the committee and reports directly to the Chief Executive.

M&S have set up a Plan A team, which is small but working with and developing guidelines in each area of the business (food, clothing and construction). The long term strategy is that Plan A will eventually be embedded into the business. The Plan A team is assisting the business until the full transition has been made.

Plan A Champions have been appointed in each store (a total of 570). Their role is to keep colleagues updated on Plan A and to find innovative ways to implement Plan A in stores. These employees are chosen through a selection process: they must show an ability to influence, convince and raise awareness. This is considered a good developmental role and allows for the acquisition of new skills.

An area of new recruitment for M&S has been that of energy analysts, which are being employed to audit the stores. Around 10 have been employed company-wide to date.

Energy Supply

In February 2009, M&S and npower (a UK energy provider) signed the UK retail sector’s biggest renewable energy contract. The six year deal will see npower provide M&S with 2.6 TWh of renewable electricity from April 2009 – enough to ultimately power all of the retailer’s stores and offices in England and Wales. M&S has now committed to purchasing enough renewable electricity to power its entire UK portfolio of stores and offices.

Under the contract, npower will supply M&S with electricity from its portfolio of renewable sources, which includes wind and hydro farms. Uniquely, the contract also allows for a significant amount (20-30%) of the supply to be purchased directly from independent small-scale generators of renewables. These are usually farmers, whose incomes will be supplemented through this deal. By doing this, M&S are not only increasing the use of renewables and promoting innovation for small scale operation by guaranteeing purchase in long term, but securing jobs in the process. It encourages some of its own suppliers (e.g. dairy farmers) to develop renewable energy generation. This is a viable secondary business opportunity for many farmers who can be confident that M&S will purchase, via npower, any renewable electricity they generate.

From a 2006/07 baseline, M&S has already reduced its like-for-like electricity consumption by over 6% and sourced over 30% of its electricity from renewables, including five distributed generation sites featuring wind turbines, anaerobic digestion plants and small hydro schemes.

10.4.2 External actions and measures

Supply chain

The company is working with the Carbon Trust to determine the greatest carbon “hot-spots” within the supply chain. Transport, food and clothing were examined. The work demonstrated that emissions caused by packaging and transportation are relatively small in comparison with raw material production (e.g. agriculture) and manufacturing. M&S is currently looking to improve the efficiency of its transport and packaging and is also working

with suppliers and stakeholders to determine how to reduce the most significant CO₂e⁴³ emissions.

Agriculture is an area where impacts are more difficult to mitigate as they are more complex. Pollution and biodiversity impacts need to be factored in. For 50% of agricultural products/processes, there is no known technology or solution to remove carbon. Commitment 23 of Plan A, which is to undertake research to understand the carbon balance associated with the production of agricultural raw materials, has yet to be started.

However, M&S have just mapped out priority projects across the supply chain (information on this is not available until next year).

A strong commitment to addressing the impacts of climate change policy can lead to driving innovation and change further down the supply chain. M&S do not select suppliers based on their performance on carbon emissions reduction: they are chosen based on quality and value. However, new M&S requirements can lead to new opportunities for suppliers (see box below) by driving them to innovate.

Driving supplier switch to new technology

The carrier bag supplier to M&S is based in Germany. M&S introduced a new policy to have recycled plastic bags in all stores. The usual supplier was approached first. This company only had a small pilot factory which made recycled plastic bags so was unable to provide the required number of recycled plastic bags to M&S. M&S placed their order with another company. After some reluctance, the original supplier decided to invest in a larger recycled plastic bag plant, employing more staff. M&S then re-awarded the contract to their original supplier. The factory uses innovative technology and is winning more business as a result.

The Supplier Exchange initiative was set up by M&S as one of its Plan A commitments. Through a dedicated website, the Exchange encourages suppliers to 'swap' best practices on reducing carbon emissions, invest in their workforce and to become more innovative. So far, 1,500 suppliers have taken part.

Energy service to customers

M&S launched a new energy service selling gas and electricity to its customers in partnership with Scottish and Southern Energy, incentivising customers to use less energy by offering a £15 M&S voucher to anyone reducing their annual energy usage by 10%. This service is packaged as a service to customers which is designed to help use less energy through home tips and tools. It offers guidance and advice. The M&S brand recognition is considered to offer a credibility that the large energy companies may not have.

Partnerships

The Chief Executive, Stuart Rose, sits on the Government business advisory council and advises on climate change and consumer behaviour issues.

M&S have worked with a number of organisations on climate change including the Energy Saving Trust, the Climate Group, BRE (Building Research Establishment) and Institute of Grocery Distributors. The company worked with WRAP (Waste & Resources Action Programme) and Energy Savings Trust to verify and create the Plan A 'Way to Save'. M&S is also a member of the CBI (Confederation of British Industry) and the Carbon Trust.

⁴³ Equivalent CO₂ (CO₂e) expresses greenhouse gas emissions (such as methane and nitrous oxide) in terms of their potential to contribute to global warming compared with that of carbon dioxide.

The company worked with WWF and the National Federation of Women's Institutes (WI) to develop a carbon awareness campaign. The Carbon Challenge has been taken up by over 8,000 WI members.

M&S also works closely with Greenpeace and Oxfam.

10.5 Impact on company performance

The impact of these measures on sales and profitability is difficult to measure. Plan A covers areas of sustainability other than climate change, so impacts of the strategy cannot be attributed to those measures addressing climate change only. Since Plan A was launched, the initiative has been cash neutral, meaning that any investment costs have been cancelled out by the reduction in energy costs which have come about by efficiency measures. These efficiency measures are, to a large extent, driven by cost avoidance (high energy prices). Putting the plan into practice means that M&S could be considered to be 'ahead of the learning curve'. The company has also created a position in the market by being known to customers as a retailer which is 'seriously trying to make an impact in terms of climate change' and helping customers to save money in the process.

Products and market focus have not changed to a great extent. The only new service is the provision of energy and advice and guidance on energy use to customers.

Competition from outside the EU is not perceived as significant. M&S stores outside the UK are mostly in the EU and competition is against other retailers within that area.

The main impact on process and methods of production are improved energy efficiency and a shift from the use of HFC gases as refrigerants.

M&S believes it has enough leverage to influence suppliers to adopt and invest in newer technologies (such as plastic bag recycling), and has encouraged suppliers to be more innovative through the Suppliers Exchange, which in turn is likely to have a positive impact on suppliers' position in the market and in turn, jobs. The exact impact on employment (whether this leads to an overall net new number of jobs) is difficult to estimate.

10.6 Impact on jobs and skills

10.6.1 Impact on jobs

The Plan A changes which have been implemented have led to the creation of 20-30 new specialist jobs in the company. These include around 10 store energy auditors and investment in the CSR team. These numbers, although important, are not very significant against the total number of the workforce (75,000).

The changes carried out to address climate change concerns and an associated reduction in costs can be said to have contributed to keeping jobs within the company – although this is again difficult to attribute directly to climate change policy drivers alone. The differentiation angle – customers choosing to shop at M&S because of what the company is doing – may have given the company a leading advantage and this indirectly may have led to the safeguarding of jobs.

The up-skilling of jobs within the company and more widely within its contractors and supply chain, has the potential to have an indirect impact on jobs. A better skilled workforce with better knowledge of green issues and the application of technologies is generally more employable.

Indirectly, M&S does have an impact on jobs through their supply chain and procurement process:

- Existing suppliers, through new long-term contracts with M&S, are encouraged to expand and innovate business, thus creating new jobs (see box on recycled plastic bags above)

- Farmers supplying M&S with food products are able to supplement their income and safeguard their living through the supply of small-scale renewable energy generation to M&S as part of the contract with npower.
- The Suppliers Exchange encourages investment in the suppliers' workforce, informs them on new technology and therefore allows for more innovation.
- M&S assistance and funding has been provided to set up two "green" supplier factories in Sri Lanka and one in Wales with two more (in China and Sri Lanka) under development.
- R&D projects looked at reducing the import of food from outside the UK by extending growing seasons and developing new varieties. This could potentially create new jobs in the UK, although this would probably equate to the displacement of jobs from within the rest of the EU.
- A study tour for M&S UK farmers was funded to visit anaerobic digestion operations in Germany. This has led to such plants being set up in the UK and three contracts are now in place to buy energy from these suppliers. This has led to the potential creation of employment and acquisition of new skills.

10.6.2 Impact on skills

Plan A has required a new set of skills from employees. Five years ago, there were no specialists in the area of sustainable development or climate change.

Awareness of climate change issues, as well as the existence of climate change policy, has led to existing job functions adopting an additional set of skills. For example:

- Food technologists were traditionally concerned with hygiene and safety issues. This area of expertise has been broadened to encompass energy and waste and how these link in with food production.
- Buyers have much more awareness of the links between climate change and weather, and the impact this has on cotton and food production. Crop production is less stable because of climate change, with crops sometimes failing. An understanding of the underlying causes for this is important during negotiations with suppliers, as well as managing supplies.
- Much of the information on climate change has been reported in technological and scientific terms. The marketing team have had to grasp the technical issues around climate change and find ways of communicating this. They have also had to understand what can and cannot be made around green claims.

Overall, many M&S employees now know much more about climate change and other green issues. These newly acquired skills are considered to be valuable as companies are looking for people who can work across various interfaces, who understand complex scientific ideas, are good at communicating these and expressing the risks adequately.

External organisations have been used in acquiring these skills. Government bodies such as the Carbon Trust and WRAP and their existing resources have been valuable in providing the required training. M&S organises workshops, seminars and on-the-job training for their staff. This is carried out through network and tapping into experts. Plan A champions in each store are given induction time and training to acquire their skills. The skills requirements are continually evolving and the training programme reflects this.

The changes made to address climate change have also had an impact on skills for businesses contracted by M&S. For example, new construction skills were required by the contractors carrying out the extensive building programme of sustainable stores for M&S. In the transition from HFCs as refrigerants, M&S was involved in the training of 100 engineers who initially did not have the required skills for the job.

10.7 Future implications of climate policy drivers

10.7.1 *Increased stringency of existing climate change policy drivers*

As a general trend, more legislation and the tightening of existing regulations is expected. As a retail company, the impact of regulations on all sectors of the economy is likely to be felt by M&S. For example, climate change policy on agriculture and aviation will have implications for the company.

10.7.2 *Implications of new climate change policy drivers*

The UK Carbon Reduction Commitment, the government's proposed carbon trading scheme for organisations such as retailers, will affect M&S by 2010. The company is very aware of this policy and much of the work it is currently carrying out in the area of carbon reduction is driven by this.

10.8 Lessons for other companies and sectors

- M&S has taken a proactive approach in responding to existing climate change policy and also looking ahead to the future. The company has put forward a comprehensive plan to do this and set itself ambitious targets.
- Investment in training for staff and the employment of a core team of experts were key elements of their approach.
- Very strong links with external organisations, government bodies (useful in terms of resources) and NGOs created partnerships and led to initiatives with these bodies.
- Strong leadership through the Executive Chairman and willingness to make changes were crucial.
- The company has thought through how it can improve its overall carbon footprint through its influence on the supply chain. In addition to initiatives such as the Suppliers Exchange and supporting the establishment of energy efficient "eco factories", it has created the drive for suppliers to innovate by awarding contracts for e.g. local renewable energy and recycled carrier bags.

11 CASE STUDY 9: ANCC-COOP

11.1 Summary

The Coop (ANCC-COOP) is a national consortium of cooperatives selling food and homeware products in Italy. Coop consortium comprises of 128 cooperatives, including 9 big cooperatives, 14 medium cooperatives and 105 smaller cooperatives. In 2007, the Coop accounted for 1,396 sale points divided in 87 Hypermarkets, 604 Supermarkets, 236 low-cost supermarkets, and 467 sale points. The turnover was over €12,167 million up from the previous year by 2.5%.

The main driver of climate change policy is the cooperative vision of business which tends to promote a responsible approach to sustainable production, distribution and consumption. However, the policy is also influenced by several other important drivers such as: business reputation, gaining a competitive advantage, anticipating regulations, tax incentives, and realising some saving in the medium-long term.

ANCC-COOP Italia has a specific retail vision based on sustainable products with a focus on ethics, environment, customers and price advantage. Environmental concerns, including dealing with climate change, are an important part of the Coop Corporate Social Responsibility (CSR). The consortium has an Environmental Action Plan setting out 10 guiding principles that are assessed and monitored each year and

These guiding principles have resulted in ANCC-COOP taking several actions for: increasing energy efficiency in commercial buildings; promoting sustainable Coop brand products; reducing packaging and using eco-materials; selling of energy efficiency domestic appliance and reducing transport flows.

ANCC-COOP has also implemented several external actions aiming at engaging suppliers in reducing CO2 emissions through a voluntary code of conduct; raising awareness amongst members and consumers through communication and information campaigns; creating partnership with institutional stakeholders and participating at European level initiatives.

The overall impact of climate change drivers on employment seem to have been slightly positive. The direct impact on ANCC-COOP has been rather small in absolute numbers but probably significant in terms of quality of job opportunities created (i.e. highly professional jobs). Climate change drivers seem to have also stimulated further employment opportunities in the supply chain and in other activities such as environmental communication as well as providing a market for eco-innovation in managing products life-cycle and commercial building.

ANCC-COOP sustainability commitment has also led to investing in training employees on the importance of reducing carbon emissions and reducing energy consumption, as well as in the sustainable planning of commercial buildings and day-to-day management.

The business believes that it will stay committed to climate change policy and continue to invest in sustainable ways to produce and distribute goods. It is also expected that climate change regulations will increase and consumers will become more and more interested in sustainable consumption and life-style.

The key lessons are:

- Anticipating regulations and green marketing initiatives with consumers can eventually lead to a competitive advantage;
- It is possible to incorporate environmental and social concerns in retailing without increasing products-prices;

- Investing in sustainable buildings requires an initial investment that will eventually lead to economic savings in the medium-long term;
- It is essential to training employees for developing internal expertise as well as hiring external consultants;
- It is important to invest in communication activities and awareness-raising campaigns with customers and citizens as well as in marketing activities;
- It is possible to engage with suppliers for promoting carbon reduction schemes on a voluntary based;
- It is possible to work in partnership with national and local institutions.

11.2 Introduction

The Coop (ANCC-COOP) is a national consortium of cooperatives in Italy. The Coop, originally set up in 1955, has traditionally sold food and since the early 1980s, the consortium has also been selling home products, including domestic appliances.

The consortium comprises of 128 cooperatives, including 9 big cooperatives, 14 medium cooperatives and 105 smaller cooperatives. ANCC-COOP operates mainly in the centre-north of Italy, with a few cooperatives in the south of Italy and in Croatia (4 hypermarkets). Overall, in 2007 the ANCC-COOP employed 55,450 people.

In 2007, the ANCC-COOP accounted for 1,396 sale points divided in 87 Hypermarkets, 604 Supermarkets, 236 low-cost supermarkets, and 467 sale points. The turnover was over €12,167 million, up from the previous year by 2.5%. By value Coop had a market share of 17% in Italy in 2007. In 2007, overall sale have increased by 3.2%.

The members of ANCC-COOP have been increased from 6.2 million in 2005 to over 6.5 million in 2007, accounting for over 10% of the Italian population.

ANCC-COOP is typically based on cooperative values which tend to have a strong focus on social responsibility, sustainable development and health and safety of consumers. Through its Corporate Social Responsibility (CSR) policy, the consortium seeks to promote a responsible approach to production, distribution and consumption in which environmental concerns are a very important part. . Recently, the environmental topic has been reviewed to increase the focus on climate change and sustainability. The Coop Environmental Action Plan sets out 10 guiding principles:

1. Adopting a sustainable development approach;
2. Respecting the environment (i.e. adopting precautionary and responsibility principles);
3. Promoting sustainable goods and service (i.e. taking into consideration the environmental impact of goods and services offered);
4. Reducing waste and increasing recycling (i.e. reducing packages and promoting recycling);
5. Promoting a sustainable cycle management of goods, from production, to storage, distribution, selling and consumption;
6. Reducing the transport of goods with a direct impact on reducing carbon emission;
7. Training employees on sustainability principles and their application in the day to day work;
8. Raising awareness on sustainability amongst the associated consumers and citizens;
9. Promoting R&D and eco-innovation;

10. Supporting sustainable policies and legislation.

The progress made on these 10 guiding principles are monitored and assessed every year.

In 2007 ANCC-COOP has also launched a project for a voluntary code of conduct with the suppliers of Coop brand aiming at reducing the CO₂ production at all levels of the supply chain.

11.3 Key climate change policy drivers for change so far

There are several reasons that explain ANCC-COOP's commitment on climate change:

1. Consortium initiative: Coop Corporate Social Responsibility (CSR)

ANCC-COOP is a consortium of cooperatives that have been set up to promote responsible production, distribution and consumption. ANCC-COOP aims to be an ethical business led by its members, The business approach is defined in the Coop CSR policy which also covers sustainable development. According to Coop, adopting sustainable practices is as a way of promoting the well-being of citizens without jeopardising the well-being of future generations.

2. Members

ANCC-COOP has over 6.5 million members. They expect ANCC-COOP to be a market leader and 'innovator' in implementing and promoting a sustainable approach to production, distribution and consumption. The members are regularly informed on environmental initiatives and their achievements through Coop publications; they are also consulted on future priorities and concerns. Besides the members, ANCC-COOP attracts customers that also trust ANCC-COOP's social and environmental responsibility. Customers are also kept informed on ANCC-COOP activities through ANCC-COOP magazines available in the department stores and other communication initiatives. ANCC-COOP also undertakes marketing campaigns on Italian TV and press focusing on sustainable retailing and good price/value ratio.

3. Competitive Advantage

The market segment of responsible consumers has been increasing over time. This is expected to increase in the future considering that consumers are becoming increasingly more aware of climate change and sustainability issues.

4. Anticipating regulations

ANCC-COOP tries to anticipate environmental regulations and also encourages self-regulation and voluntary code of conduct amongst suppliers. This approach is expected to lead to a competitive advantage when regulations are eventually introduced.

ANCC-COOP has started to create internal and external mechanisms (i.e. voluntary code of conduct with the suppliers) for the reduction of CO₂ ahead of the established time frame 2008-2012 for reducing greenhouse gases, as agreed under the Kyoto protocol in 1997.

5. Tax incentives

ANCC-COOP has benefitted from tax incentives (i.e. tax deduction) made available by Italian local governments for realising energy efficient investments (e.g. photovoltaic cells).

6. Realising savings in the medium-long run

The adoption of higher energy-efficiency policies in ANCC-COOP operations and ANCC-COOP sale points requires an initial investment which can be rather substantial, but it will eventually lead to some savings in the medium-long term. The savings in production costs might even be reflected on the final price of the goods to the benefit of the consumers.

11.4 What has the company been doing so far?

11.4.1 *Internal actions and measures*

Increasing Energy Efficiency in commercial buildings

ANCC-COOP assesses the environmental impact of its commercial buildings and seeks to increase energy efficiency and to reduce CO₂ emission through three main lines of actions:

Adoption of energy-efficient technology:

- Adoption of photovoltaic cells (6 supermarkets) and other alternative energy generating system, such as hydroelectric and tele-heating (adopted in 15 commercial buildings). Photovoltaic cells systems have led to a reduction of 24,900 tonnes of CO₂.
- Eco-heating systems: from 2001 to 2007 over 120 eco-heating systems have been adopted in ANCC-COOP commercial buildings resulting in a CO₂ reduction of 2,330 tonnes in 2007.
- Eco-cooling systems (refrigerator and air conditioning) using the ecological gas R134A and reducing energy consumption by 30%.
- Eco-refrigerators and freezers also allowing for the utilisation of the heating produced for sanitary water heating.
- Energy Saving Lighting: ANCC-COOP takes part in the European programme 'Greenlight for improving energy saving'. Over 180 selling points are part of the Greenlight programme, and 35 are about to enrol. It has been estimated that in 2007 over 65,600 tonnes of CO₂ have been reduced.

Energy-efficient design and construction of new commercial buildings: for example, new supermarkets are built in a way to maximise natural lighting and heating, reducing the need for artificial lights and heating.

Energy-efficient integrated management of commercial buildings: for example, over 380 stores have a system of 'integrated energy production and control' allowing for the monitoring of cooling, heating and lighting systems. The main benefits are: fine-tuning the energy consumption with opening and closing time; adjusting the level of artificial light according to natural light; measuring real-time energy consumption and identification of unnecessary over-production. The monitoring is also used for planning energy efficiency interventions.

Promoting sustainable ANCC-COOP brand products (life-cycle assessment)

ANCC-COOP promotes the commercialisation of sustainable products through its own ANCC-COOP brand. Currently there are over 2,700 ANCC-COOP brand products that are regularly monitored. ANCC-COOP products have to be sustainable during their life-cycle by reducing packaging and being recyclable.

ANCC-COOP promotes the use of innovative eco-material for packaging such as recycled plastic (for example for detergents and cleaning products packages), recycled celluloses for the packaging of ANCC-COOP home products, and the use of renewable products such as biopolymers. In fact, ANCC-COOP is the first retail in Italy that used biopolymers (or PLA) material for the packaging of large quantity of its products. The use of PLA has increased from 24 tonnes in 2004 to 157 tonnes in 2007.

Eco-material for packaging

Biopolymers (or PLA) are polymers that are generated from renewable natural sources. They are renewable, sustainable, and can be carbon neutral.

Biopolymers are renewable because they are made from plant materials and are not derived from petrochemicals. In addition, biopolymers have the potential to cut carbon emissions and reduce CO₂ quantities in the atmosphere.

Reducing packaging

Since 2006, some ANCC-COOP supermarkets have introduced automatic dispensers of detergents and cleaning products. Customers have to buy one disposable detergent container and re-fill it without having to purchase a new container every time. The usage of the automatic dispensers led to a reduction of 14 grams of CO₂ for each re-filled detergent container.

Selling of energy efficiency domestic appliance

ANCC-COOP promotes the commercialisation of innovative energy saving domestic appliance such as air conditioning, washing machines, dish washers, fridges and freezers, ovens, as well as energy efficient light bulbs. This action contributes indirectly to carbon reduction. Based on the selling of these products, the CO₂ reduction is estimated to be 34,370 tonnes in 2007.

Reducing transport

ANCC-COOP is encouraging the centralisation of goods transport by creating logistic platforms for the distribution of goods for several selling points. This helps in reducing long-distance travelling and increases the optimisation of transport (for example the numbers of long-distance travelling with half-emptied trucks are minimised and travelling with full-loaded trucks are maximised). It has been estimated that in certain cases this process has reduced transport flows by 40% for supermarkets and up to 90% for hypermarkets.

11.4.2 External actions and measures

Voluntary code of conduct for suppliers

ANCC-COOP has launched an initiative for engaging suppliers on greenhouse gas emission reduction and energy saving actions on a voluntary basis. The initiative has been implemented in partnership with "Bureau Veritas Quality International", a certification institute which provides the technical support for dealing with climate change challenges, monitoring energy consumptions, and making suggestions for increasing energy efficiency and savings.

In 2007, ANCC-COOP undertook several initiatives for engaging suppliers:

- A survey of suppliers' interests in sustainability issues and dissemination of findings in a workshop with suppliers and in a publication;
- Monitoring and analysis of supply chain system;
- Analysis of energy consumptions and CO₂ emissions on 76 suppliers;
- Creation of an Action Plan for suppliers on energy saving, with practical suggestions, case studies and a self-evaluation tool-kit on greenhouse gas emissions.

Communication and information campaign

ANCC-COOP undertakes communication and information campaigns on a regular basis. The objective is to raise awareness for its consumers as well as for citizens and students and to promote better informed consumer choices and sustainable lifestyles.

For example, in 2007 ANCC-COOP launched an information campaign on the Kyoto protocol and the need to reduced energy consumption. ANCC-COOP has also prepared a guideline for helping consumers to take practical steps for reducing energy consumption in their daily activities and has engaged with 2,500 families who have committed to follow the suggested guidelines.

Partnership with institutional stakeholders

ANCC-COOP has established several agreements cooperation on climate change issues with national and local institutional stakeholders. For example, in 2007 an agreement was signed with the Italian Ministry of Environment for the promotion of innovative projects for the reduction of environmental impact of big commercial buildings and the supply chain.

Another initiative is the ANCC-COOP agreement with local governments for car sharing. Under this agreement, ANCC-COOP members are entitled to a discount when enrolling in car sharing schemes.

European level action

ANCC-COOP is associated to Eurocoop, the European association of retail cooperatives⁴⁴. At the European level, ANCC-COOP contributes to the preparation of the climate change agenda (for example an Action Plan has been prepared), and to the exchange and dissemination of good practices in energy saving, communication campaigns and suppliers engagement.

The active participation at the European level also enables ANCC-COOP to take part in European innovative initiatives for energy efficiency such as Green Lighting for reducing lighting energy use.

11.5 Impact on company performance

Impact on sale and profitability

It is not easy to measure the overall impact of climate change policy on sale and profitability. Yet, the available indicators seem to suggest a rather positive relationship in the medium to long term.

The sale of ANCC-COOP branded products as a share of overall sales has increased from 15.1% in 2001 to 19.6%. ANCC-COOP brand products seem to have a clear positioning due to a well-defined policy in terms of quality control, value and communication. ANCC-COOP brand products guarantee a good quality/price ratio: they are not always the cheapest available, but the high volume of production makes it possible to keep the cost of sustainable products down. The use of innovative eco-material for packaging such as eco-material (see box above) is more expensive than many petroleum-derived commodity plastics, but its price has been falling as demand has increased.

Investments in energy saving technology have initial costs, which can be substantial. However this can be paid off in the long, medium-long term. For example, the installation of a photovoltaic cells system for producing 595 MWh per year required an initial investment of € 2 millions. It will take around 10 to 15 years to realise some of the savings. However, once the savings are realised they can be passed on to consumers, giving ANCC-COOP a competitive advantage.

Competition

ANCC-COOP might be considered one of the Italian market leaders in sustainable retail, offering a wide range of 'green' products at competitive prices.

⁴⁴ <http://www.eurocoop.org/home/en/default.asp>

Customers' relations

Customers relations have been positive. ANCC-COOP provides information to customers about its initiatives for climate change (i.e. ANCC-COOP magazine, publications, website, marketing and advertising). Customers value the social and environmental values of ANCC-COOP and the balance between quality, ethic and price that the cooperative has been able to strike. Customers are also regularly consulted on the environmental issues and are engaged in saving energy education campaigns. The number of ANCC-COOP members has risen to 6.5 million in 2007.

11.6 Impact on jobs and skills

11.6.1 Impact on jobs

ANCC-COOP CSR policy, covering environment but also other social and ethical issues, has led to the creation of some new jobs. In 2005 there were 100 people working on CSR across the consortium. The number has risen to 108 in 2007.

More specifically, ANCC-COOP's environmental policy has contributed to job creation at two levels: internally, with the creation of INRES an internal body provided consultancy services and externally through the temporary hiring of external consultants to work on specific environmental initiatives.

Internally: INRES is a consortium for advising and providing consultancy services on technological innovation and eco-planning of commercial building. INRES supervises the planning and management of supermarket, hypermarkets and other smaller sale points to support the adoption and integration of sustainable technologies. This consortium also assesses the sustainability of distribution and commercialisation strategies.

Externally: the environmental initiatives undertaken by ANCC-COOP led to the creation of some new jobs. It is estimated that around six/seven external consultants are contracted out every year to work on specific environmental issues.

ANCC-COOP has also stimulated job-creation indirectly through the creation of ANCC-COOP product brand (with suppliers, farming and eco-innovation producers) communication campaigns. ANCC-COOP suppliers that agree to become part of ANCC-COOP brand have to comply with a code of conduct which requires, amongst other things, the reduction of waste and recycling, the reduction and purchasing of bio-material for packaging. ANCC-COOP brands also have to go through a certifying authority for testing. These initiatives have prompted the supply-chain to innovate and to adopt new production systems (for example sustainable farming). They have also had a positive influence on small local economies and provided a market for eco-innovation (for the example the purchasing of eco-material for packaging).

Communication campaigns: ANCC-COOP invests considerably in communication, raising awareness and marketing itself as an ethical retail company. These activities are providing a market for environmental communication experts (for example, in 2007 an external communication campaign was organised on Kyoto Protocol, called Coop4Kyoto).

Research: Coop has commissioned research on sustainable issues to 3 Italian Universities.

11.6.2 Impact on skills

ANCC-COOP has traditionally invested in training employees on CSR policy. In 2006, ANCC-COOP created a 'Coop School' for disseminating CSR policy with employees but also to foster a cooperative culture with consumers. The main tasks of the Coop School are to promote training, life-long learning as well as innovation in management. Training on environment, sustainability and climate change are part of mainstream life-long learning programme; in addition specific training modules are also organised (for example on packages and recycling).

The Coop School mainly trains the head of sale points that will eventually be responsible for organising training activities for the employees at the sale points (principle of training the trainers).

Specific training activities are also organised when new technology or management procedures are introduced (i.e. waste reduction, recycling, energy saving and management).

ANCC-COOP also contributes to 'train' customers on sustainable issues through ANCC-COOP publications and information initiatives. For example, ANCC-COOP prepares leaflets to explain how customers can contribute to the achievement of Kyoto Protocol by adopting more sustainable behaviour and life-styles.

11.7 Future implications of climate policy drivers

11.7.1 *Increased stringency of existing climate change policy drivers*

ANCC-COOP claims that it will stay committed to climate change policy and it will continue to invest in sustainable ways to produce and distribute goods.

The cooperative is also planning to continue its efforts to raise climate change awareness amongst customers and to promote sustainable life-styles.

11.7.2 *Implications of new climate change policy drivers*

Drivers to reduce carbon emissions are expected to increase. On one hand there will be more regulations and incentive schemes to adopt new technology and eco-innovation, on the others consumers will be more interested to buy sustainable products, especially when these are sold at a reasonable cost.

11.8 Lessons for other companies and sectors

- ANCC-COOP has been a frontrunner in dealing with climate change. By anticipating regulations and green marketing initiatives with consumers it has gained a competitive advantage.
- ANCC-COOP has been successful in producing and selling sustainable products at a fair price. The high volume of production and sale, as well as the cooperative values make it possible to incorporate environmental and social concerns without increasing products prices.
- Coop has invested in sustainable buildings. This requires an initial investment that should lead to economic savings in the medium to long term.
- ANCC-COOP has focused on training employees, developing internal expertise such as creating a consortium (INRES) for providing consultancy services for planning and managing sustainable commercial buildings, as well as hiring external consultants.
- ANCC-COOP has invested in communication activities and awareness-raising campaigns with customers and citizens as well as in marketing activities.
- ANCC-COOP has engaged its suppliers in carbon reduction schemes based on a voluntary code.
- ANCC-COOP has created partnership with national and local institutions.

12 CASE STUDY 10: CARREFOUR

12.1 Summary

Carrefour is one of the largest retail Group in Europe, with a significant presence outside Europe in Asia and South America. It has over 15,000 stores, in the forms of hypermarkets, supermarkets, convenience stores and hard discounts, either company-operated or franchised. In 2008 the retail group employed over 495,000 employees and opened or acquired 1,191 new stores. In the same year, the overall turnover was €97.6 billion up by 6.3% from previous year, with sales increase driven by the emerging markets from Asia and South America.

Carrefour addresses the challenges and opportunities associated to climate changes by undertaking its own risk management. The Groups is keen to take a pro-active and anticipatory approach to this issue.

Several factors can be identified as drivers to climate change: the company CSR policy, increasing efficiency by reducing energy consumption, anticipating regulation, assessing and reducing possible physical risks related to climate change, dealing with customers, investors and society's expectations over business to be responsible towards the environment.

The Group is committed to energy saving and has a specific target of 20% energy reduction by 2015. A number of actions have been implemented to support this objective and broader sustainability goals:

- Identification of Key Performance Indicators for monitoring and benchmarking the group performance on sustainability;
- Specific actions for reducing energy consumption, such as the adoption of an Energy Management System (EMS) and consequently purchasing of new and more efficient equipment;
- Calculation of the Carbon Footprint following the GHG protocol;
- Life Cycle Analysis of a number of products;
- Selling of energy efficient products, such as eco-labelled products;
- Limiting greenhouse gas emissions from transport by using alternative ways of transport such as waterways and rail; and
- Internal Management attention to climate change issues (i.e. all Group Business Unit are requested to report to the corporate sustainability team).

Carrefour is also working with the suppliers, helping them to better understand the challenges and identify practical solutions to reduce their carbon footprint. To this end, the Group participates in the "Carbon Disclosure Projects & Supply Chain Leadership" and has prepared a self-evaluation tool for suppliers.

The Group also implements a number of initiatives for raising awareness amongst costumers (e.g. special information events take place during the World Environmental Day), and is active in working in partnership with a variety of stakeholders, such as environmental organisations, government, Environmental Agency, industry associations, and the European Commission).

Climate change actions contribute to improving the company's image, brand recognition and customers loyalty. However, it is very hard to assess the financial effect and impact on sales of image improvement. However, being able to offer energy efficient products should represent a clear advantage, especially considering consumers' increasing demand for environmental products.

The direct impact of climate change policy on job is limited – there are six people responsible for the annual Sustainability Report. However, the impact on indirect job creation might be higher (for example in the supply chain, external consultants, creating a market for energy efficient products, etc.), although no figures or estimates exist on this.

Carrefour considers that there is a greater impact on skills as many jobs have to take on board new considerations related to climate change and sustainability. For example, energy saving objectives and the delivering of energy efficient actions are now assessed as part of personnel performance review of concerned employees. Training is often offered in the forms of raising awareness initiatives, on-job training and peer-learning (i.e. identification and dissemination of best practices for energy reduction across business units).

Carrefour expects regulations for dealing with climate change to increase. On the one hand, actions leading to more energy efficiency have the potential to increase the overall efficiency of the business. On the other hand climate change regulations need to be carefully assessed against the real benefit they bring about in terms of greenhouse gas emissions and the costs they impose on businesses.

The key lessons are:

- Top management commitment is essential for the successful implementation of climate change initiatives;
- Energy reduction targets facilitates the implementation of concrete actions and regular benchmarking;
- Systems for assessing energy consumption and carbon footprint help to identify adequate interventions and quantification of energy saved over time;
- Systematically reporting on the actions and progress made is an important communication tool for addressing rising demands and expectations with customers, investors and shareholders;
- Climate change actions are also an opportunity to increase company efficiency and reduce cost on energy spending;
- A pro-active attitude helps business to anticipate, better prepare and negotiate regulatory changes;
- Proposals for dealing with climate change need to have clear benefits in terms of greenhouse gas emissions reduction and not be too onerous on business and suppliers;
- Suppliers tend to lack the resources to address climate change issues. Large companies have a role in raising suppliers' awareness and supporting them in implementing feasible solutions. Changes are likely to happen in an incremental way rather than in large shift;
- The direct impact on jobs of Carrefour climate change actions is minimal compared to the overall employment (i.e. six people in the sustainability unit). However the indirect impact, for example in terms of external consultancies providing services related to climate change initiatives, is expected to be more significant;
- Climate change policies have an implication for skills and training. Carrefour carries out raising awareness events for its employees and supports on-the job learning and peer-learning;
- Working in partnership with a range of stakeholders helps to bring to the business specific expertise and awareness of future challenges/opportunities/regulations.

12.2 Introduction

Carrefour is one of the largest retail groups in Europe, with a significant presence outside Europe in Asia and South America. Carrefour has over 15,000 stores, in the forms of hypermarkets, supermarkets, convenience stores and hard discounts, either company-operated or franchised. In 2008 the retail group employed over 495,000 employees and opened or acquired 1,191 new stores. In the same year, the overall turnover was €97.6 billion up by 6.3% from previous year, with sale increase driven by the emerging markets from Asia and South America.

Carrefour addresses the challenges and opportunities associated to climate changes by undertaking its own risk management. The Group is keen to take a pro-active and anticipatory approach to this issue. Reducing greenhouse emissions is also part of the overall company Corporate Social Responsibility (CSR) and since 2001 the Group has produced an annual report on sustainability (the Sustainability Report) presenting the actions implemented by the company to decrease environmental impact in production, logistic and store operations.

Recently the company has committed to reduce the consumption of electricity by 20% by 2015, with the 2004 taken as a basis for comparison, and also to encourage suppliers and customers to reduce their consumption. The Group has joined the “Carbon Disclosure Project Supply Chain Leadership Collaboration” to raise suppliers’ awareness on climate change risks and opportunities. Furthermore, since 2007, the Sustainability Report includes the Group greenhouse emissions according to GHG Protocol⁴⁵.

Since 2004, the Group has reduced its consumption of electricity by 8.5%.

12.3 Key climate change policy drivers for change so far

There are several drivers to Carrefour climate change policy.

6. Company initiative: CSR policy

Since 2000 Carrefour has a CSR policy addressing climate change amongst other environmental challenges, such as biodiversity, waste, water, etc. CSR policy is driven by shareholders’ and investors’ demands to respond to society needs in responsible ways as well as by the need to anticipate in regulations.

During the annual stakeholders meeting, the different organisations participating have the opportunity to provide their feedback and views on the Sustainability Report and initiatives undertaken for dealing with climate change and sustainability.

With regards to climate change the Group’s main priority is to reduce electricity consumption in both new and existing stores. The target is to reduce the Group’s consumption of electricity by 20% by 2015 taking 2004 as the baseline. This exceeds the goal set by the European Commission. Since 2004, the Group has reduced its consumption of electricity by 8.5%.

7. Increasing efficiency

In times of rising oil prices, energy saving actions are also seen as contributing to reaching a higher economic performance and increasing competitiveness both for Carrefour internal operations and for promoting higher efficiency in the supply chain. In other words, reducing energy consumption can be seen as an opportunity for cost reduction.

⁴⁵ The Greenhouse Gas Protocol (GHP) is the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions.

<http://www.ghgprotocol.org/>

8. Regulatory risk

In 2007 the European Commission set out targets for 2020 and a vision for 2050 concerning energy saving and reduction of greenhouse emissions. Carrefour expects that this will trigger further regulations.

National regulations might be even more stringent. For example, Carrefour operating in China had to reduce energy consumption by 20% by the end of 2008, as requested by Chinese government. Likewise, in France, the government through a multi-stakeholders Environmental Forum (Grenelle for the Environment) has prepared a number of recommendations to be implemented through voluntary agreements and legislative measures.

Carrefour tries to anticipate regulations when possible. For example, the anticipation of any potential carbon labelling has prompted Carrefour to undertake work on the life cycle analysis of products.

9. Physical risk

The Group has completed a detailed physical risk assessment and mapping for each country in which operates.

The main risks associated with climate change are: extreme weather, changes in weather pattern, flooding, rising ocean level, etc. Carrefour estimates that these may impact on Carrefour activities in a number of ways:

- Store activities may be affected by flooding, storm damage and increased need for heating or air conditioning;
- The supply of products may be affected, especially agricultural products, due for example to wide crop damage or crop failure;
- Clients' demands for products may change rapidly in response to extreme weather – both hot or cold- or unusual weather (e.g. seasonal goods associated with hot or cold weather may suddenly increase or decrease).

The Group has also undertaken a risk assessment of the impact of climate change on health, indentifying the people that are likely to be more concerned and the potential impact on the business.

To date there has been no significant impact to Carrefour activities of extreme weather events, rising temperature or sea level rising.

Changes in weather patterns affect the availability and price of agricultural production. However, the negative impact has been felt only at the local level and not on the Group activities given its presence and access to products in over 30 countries.

10. Reputational risk

Carrefour perceives this as both a risk and an opportunity to increase customers loyalty. Climate change engagement is a way of meeting growing consumers' and society's demands for companies to act responsibly and to contribute to sustainable development. Awareness over climate change policy has arisen in part due to media coverage.

The Group is keen to build up a positive image and communicate its policies in reducing greenhouse gas emissions and to provide a range of products that are environmental friendly.

Furthermore, there are increasing expectations from shareholders and investors to act in a responsible way. This can be seen from investors' demands on how the business operates,

from rating agencies, and initiatives such as the Carbon Disclosure Project⁴⁶ where questions on how the companies are dealing with climate change are asked on behalf of investors.

11. Litigation risks

The Group does not consider litigation risk to be a relevant issue

12.4 What has the company been doing so far?

Carrefour has undertaken a number of activities to help reduce greenhouse emissions.

12.4.1 Internal actions and measures

Identification of Key Performance Indicators (KPIs)

A set of Key Performance Indicators (KPIs) have been identified to monitor and benchmark the Group performance on sustainability. These are: energy, refrigerants, emissions, logistics, paper for commercial publications and shopping plastic bags. All business units of the Group monitor their KPIs against a benchmark to ensure that progresses are made.

Energy consumption reductions

Carrefour is committed to reducing consumption of electricity by 20% by 2015 compared to 2004.

An Energy Management System (EMS) had been adopted for monitoring of energy consumption and for identifying the highest-consuming equipment. Investments have been made to purchase more energy efficient equipment, such as close freezers, night covers for cold units and low-energy lamps and lighting. The EMS has showed that 65% of electricity consumption relates to the refrigeration system (45% cooling and 20% air conditioning).

In 2007, hypermarkets in France reduced their energy consumption by 20% and supermarkets by 10%.

The Group has considered the opportunity to produce its own renewable energy at stores with, for example, solar energy. However, it has concluded that the current technology is not sufficiently mature to produce the necessary quantity of electricity for commercial buildings. For example, it has been calculated that if a store roof space was covered with solar panels, less than 5% of the store electricity needs would be met. In addition, in the best case scenario (i.e. with government funds), the investment made would have a payback of over eight years.

Assessing and reducing the Carbon Footprint

Since 2007 Carrefour reports on greenhouse gas emissions according to the GHG Protocol. Figures are provided in the annual Sustainability Report, which includes the calculation for Carrefour direct and indirect emissions. The calculation goes beyond the basic requirements and provides information also on the emissions related to refrigerators and cooling systems including HCFCs.

Cooling and air conditioning systems are a significant source of greenhouse gas emissions. For this reasons, Carrefour has been testing the use of less polluting fluids to replace high-greenhouse gas emission fluids in refrigeration systems.

The Group has also done a carbon assessment of its headquarter in France and several hypermarkets, supermarkets, convenience stores and warehouses, using an assessment

⁴⁶ The Carbon Disclosure Project (CDP) is an independent not-for-profit organisation which holds the largest database of corporate climate change information in the world.

<http://www.cdproject.net/>

tool developed by the French Environmental Agency. This tool requires collecting information about the sites, activities, energy consumption, resources uses, employees travel to work and business travel. As a result, the Group has identified a number of ways to reduce the carbon footprint at the head office such as encouraging teleconferencing and video conferencing, the use of trains and public transport, car sharing for home/work journey and the reduction of paper consumption.

Life Cycle Analysis (LCAs): identifications of principal emission sources

Carrefour is the first retailer to have undertaken work on the Life Cycle Analysis of products (LCAs). In 2003, it commissioned an LCA on plastic shopping bags, in 2005 on paper catalogues, and in 2007 on packages. The business has introduced LCA on a range of products with the view to identify 'hot spots'. These are those steps in the life cycle of a product which have the highest level of environmental impact, including greenhouse emissions. The plan is to carry out a couple of LCAs every year on Carrefour own-brand products.

Once hot-spots are identified solutions can be worked out to reduce environmental impact. The work carried out on LCAs has been useful in helping to understand the role played by the supply chain and consumers. For example, a recent LCA on frozen green beans showed that the emission hot-spots are: refrigeration by suppliers and the consumer phase (i.e. storage of beans, cooking and food waste). Once hot-spots have been identified solutions can be worked on to reduce the impact.

According to LCAs, the most relevant greenhouse gas emissions occur at upstream levels of the life cycle, with the extraction of raw material, the production of semi-finished and finished goods, and then at downstream level with the use and disposal of products. The LCAs undertaken on plastic shopping bags and paper catalogues demonstrated that the main environmental impact occurred during production of plastics and paper respectively. As a result, Carrefour is aiming to reduce the number of free plastic shopping bags and the quantity of paper catalogues. In 2007, the number of shopping plastic bags distributed decreased by 475 million, accounting for a saving of 8,000 tonnes of CO₂.

Selling of energy efficient products

Carrefour offers a range of energy efficient products or eco-labelled products, which contribute indirectly to the decrease of greenhouse gas emissions. Examples of these products are energy saving light bulbs, rechargeable batteries, insulation materials, solar energy driven products, energy efficient appliances, wood fuels.

Carrefour France also promotes the use of Natural-Gas Vehicles (NGVs) and is widening access to bio-fuels. For example, the Group opened the first French NGV pump for customers at Toulouse Purpan hypermarket.

Limiting greenhouse gas emissions from transports

Carrefour encourages the optimisation of loading trucks on journeys to Carrefour warehouse to reduce CO₂ emissions. To this end, Carrefour France has built two consolidated warehouses for the collection and storage of goods from the different suppliers.

When possible, the Group gives priorities to alternative ways of transport, such as waterways and rail. In 2007, in France almost 35% of import flows were transported by waterway from Le Havre. This represents a saving of 250 tonnes of CO₂.

Internal Management

The Management Board has the responsibility for climate change, assisted by a team of six people in charge of the Sustainability Report, which liaise with a correspondent in each business unit (there are around 20 correspondents in total, at least one for each country).

Sustainability issues are integrated in each activity: store management, logistics, transport, etc. All the business unit correspondents report back to the sustainability team which reports directly to the CEO. Key dossiers are presented to the Management Board on a 'needs basis'. In 2007 for example the energy policy proposals were presented to the Board. In addition, the Management Board requests regular presentations on progress made towards the energy savings objectives

12.4.2 External actions and measures

Suppliers

Carrefour takes part in the "Carbon Disclosure Projects & Supply Chain Leadership Collaboration" with the aim to raise suppliers' awareness and help them to reduce their greenhouse emissions. As part of this project, a letter was sent to over 600 of Carrefour own-brand suppliers with a questionnaire asking them what measures they were taking to improve their carbon footprint. The exercise served to:

- Raise awareness of climate change issues with suppliers;
- Making them to understand that climate change issues are important for Carrefour; and
- Help them to realise the risks and opportunities associated with climate changes.

The questionnaire was considered too onerous by many suppliers and this prompted Carrefour to send out a more user-friendly self-evaluation tool on sustainability. This included a questionnaire but it is a more pragmatic tool, which helps the suppliers to identify measures which can help them to develop simple action plans and can be easily implemented.

The tool is made up of 50 points and for each point 4 levels of actions are described. The suppliers select the level they think they are. The main benefit of the tool is that it allows the supplier to reflect upon what they are actually doing and reflect on what else could be done to achieve a higher level.

Carrefour has also provided additional support to a number of suppliers by reviewing with them the self-evaluation and carrying out an environmental audit on site.

Carrefour also promotes full truck journey to its warehouses by encouraging suppliers to organise 'group delivering'.

The main problem for suppliers is that most of them are SMEs without sufficient resources to address many of the issues associated to climate change. For example, they work in a competitive environment, have to keep prices down and cannot afford to recruit extra people that could look after climate change issues.

Raising customers' awareness

The Group has implemented a number of initiatives for raising climate change awareness with customers and employees. For example, Carrefour energy efficient products are marketed through signposting in store and on the website. The Group also organises information campaigns during the World Environmental Day, and takes part in the European Sustainable Energy Campaign, promoted by WWF and the European Commission.

Partnerships

Carrefour has established working relationships with relevant stakeholders, such as environmental organisation, governmental bodies, universities, the European Commission and the United Nations Environmental Programme (UNEP).

The Group holds regular meetings with Greenpeace, and has been working with WWF for over 10 years. In France, Carrefour has established working relationship with the

government (e.g. on alternative fuels) and with the Environmental Agency (e.g. on carbon footprint) and also contributes to university programmes at Dauphine and HEC Universities on CSR in multinational companies.

At European level, Carrefour participates in the DG Environment Retail Forum. In February 2009, during the Sustainable Energy Week, the Group was the only retailer group to partner the European Commission on awareness-raising campaign for customers.

12.5 Impact on company performance

Carrefour considers that actions for dealing with climate change and sustainability in general contribute to improving the company's image, brand recognition and customers loyalty. In particular, it has been observed that both investors and clients have reacted positively at the Group's initiatives for dealing with climate change. However, it is very hard to assess the financial effect of image improvement.

Climate change initiatives are not perceived as having a direct impact on company sale and profitability, although being able to offer energy efficient products represents a clear advantage, especially considering consumers' increasing demand for environmental products.

12.6 Impact on jobs and skills

12.6.1 Impact on jobs

Carrefour perceives that there is little direct impact on employment from their actions on climate change. The team that works at the Sustainability Report is made up of six people, against over 495,000 employees around the world. However, the impact on indirect job creation might be higher (for example within the suppliers, external consultants, creating a market for energy efficient products, etc.). For example, the LCAs, that are currently being carried out, as well as the impact of potential new regulations (e.g. as a result of the Grenelle Environment Forum) has led to the contracting of many external consultancies. There is a growing recognition of the importance of products life-cycle analysis and those companies which are able to offer these services benefit from these new approaches. This can be perceived as a direct impact on turnover and potentially even new jobs for these companies.

12.6.2 Impact on skills

Carrefour considers that there is a greater impact on skills as many jobs have to take on board new considerations related to climate change and sustainability. For example, energy saving objectives and the delivering of energy efficient actions are assessed as part of personnel performance review of employees responsible for the implementation of these actions.

Training is often offered in the form of raising awareness initiatives (often in cooperation with environmental organisations), on-job training (i.e. how to use new equipment) and peer-learning (i.e. identification and dissemination of best practices across business units).

For example, in 2008 the company held a training session for all Group Business Units based on the dissemination of best climate change management practices identified at country level. This training was considered successful and the company has made further progress in reducing energy consumption. In China, a raising awareness videos section was organised for the head-office employees with the support of WWF. In Thailand, a climate change awareness event was organised for employees with the support of Greenpeace.

The collaboration with French universities on CSR means that Carrefour can potentially widen the curriculum for training future managers, including human, social and environmental issues.

12.7 Future implications of climate policy drivers

12.7.1 *Increased stringency of existing climate change policy drivers*

Carrefour expects that measures for dealing with climate change policy will increase. For example, in France, one of the proposals of the Grenelle Environmental Forum is to create a carbon labelling for products.

12.7.2 *Implications of new climate change policy drivers*

Actions leading to more energy efficiency have the potential to increase the overall efficiency of the business. However, Carrefour believes that climate change regulations need to be carefully assessed against the real benefit they bring about in terms of greenhouse gas emissions and the costs they impose on businesses. For example, it is believed that the introduction of a climate change labelling, as proposed by the Grenelle Environmental Forum, would be of little use. According to Carrefour, on the one hand there is much uncertainty in carbon calculation and thus the accuracy of carbon labelling might be called into question. On the other hand, this information would have no impact on customers purchasing patterns and the cost of labelling would create an inflationary pressure on production cost of the products and would represent a too high burden on suppliers.

12.8 Lessons for other companies and sectors

There are a range of lessons from the Carrefour experience that can be interesting for other business:

- It is important to have a policy on climate change that is fully supported and endorsed by the top management. Carrefour's Management Board and CEO take a direct interest in initiatives that are related to climate change. A Sustainability Unit has been created and in each Group Business Unit there is a person responsible, amongst other things, for reporting on sustainability issues.
- Having specific energy reduction targets is useful for facilitating the implementation of concrete actions and regular benchmarking. This would also help to keep the motivation and commitment of the company high.
- Having in place systems for assessing the actual energy consumption and carbon footprint is important for identifying adequate interventions (e.g. purchasing of new technology or equipments) and undertaking systematic monitoring and quantification of energy saved over time.
- Reporting systematically on the actions and progress made (i.e. annual Sustainability Report) is an important communication tool to meet rising consumers, investors and stakeholders' expectations and demands for more sustainable businesses.
- Climate change actions are also an opportunity to increase company efficiency and reduce costs of energy spending.
- Anticipating regulatory changes helps businesses to be better at absorbing and negotiating the requirements of future regulations and laws.
- Proposals for dealing with climate change have to be carefully assessed against the real benefits in terms of reduction of greenhouse gas emissions and costs on business and suppliers.
- Suppliers, which are mostly SMEs, tend to lack the resources to address many of the issues associated to climate change. Large companies have a role in raising suppliers' awareness and supporting them in identifying and implementing feasible solutions. Changes are likely to happen in an incremental way rather than in a large shift.

- The direct impact on jobs of Carrefour climate change actions is minimal compare to the overall employment (i.e. six people in the sustainability unit). However these jobs tend to be highly skilled. The indirect impact, for example in terms of external consultancies providing services related to climate change policy, is expected to be more significant.
- Climate change actions have an implication for skills and training. Carrefour carries out raising awareness events for its employees and supports on-the job learning and peer-learning (e.g. exchange of best practices in energy reduction across the different Business Units).

13 CASE STUDY 11: VINCI

13.1 Summary

The VINCI group, which has headquarters in France, is one of the largest construction and concession companies in the world. Since its creation in 2000 (from the merger of two large groups, SGE and GTM), it has put in place a strategy to integrate sustainable development (SD) within all its activities.

Addressing climate change and reducing carbon emissions are key parts of the group's SD strategy and this is integrated within the management structure and business approach.

Drivers for change appear not so much to be regulation rather than motivation to be the leader in their field by anticipating demand for energy efficiency and reducing their carbon footprint, as well as seeing climate change as a threat which should be tackled. Regulatory drivers are seen as a market opportunity which will generate more demand for the innovative eco-efficient solutions VINCI are developing.

The company has undertaken the following measures to reduce CO₂ emissions:

- VINCI monitors its greenhouse gas emissions and quantifies them for its business activity in France and abroad using the ISO14064 standard and drawing on the French carbon assessment method, the Bilan Carbone.
- VINCI's goal is to combine economic performance with humanistic social policy, which underpins their Sustainable Development Programme. This is built around 5 priority commitments one of which is: "To quantify greenhouse gas emissions by identifying the biggest sources of emissions and reducing them wherever possible."
- A sustainable development team was set up in 2000 which has specific responsibility for climate change. A sustainable development committee of 20 people covering all aspects of the group's activities meets several times a year.
- VINCI has taken actions to reduce the carbon impact of its activities through the increased use of local resources, use of new materials and technologies and use of renewable energy.
- Taking into account the CO₂ lifecycle of the project (from construction through to use and demolition) is the group's main approach in addressing climate change impacts. Tools have been developed to measure the environmental impacts of buildings and infrastructure projects.
- VINCI has invested in an R&D team in the search for innovative solutions. There are currently 180 researchers and scientists working on around 45 research programmes.
- VINCI encourages its buyers to include the issue of reducing greenhouse gas (GHG) emissions in their dealings with suppliers in order to identify their best practices and support their efforts in this area.
- The greatest potential reductions in greenhouse gas emissions available to VINCI are in the emissions generated by its customers, rather than its own activity. Many of the VINCI operations are therefore actively communicating to their customers to look at ways of reducing carbon emissions at the use stage of a project.

Externally, VINCI works actively and widely with a range of partners and stakeholders. This includes participation in many industry symposia and workshops on sustainable development and contribution to policy-making, notably at the Grenelle Environment Forum. A think tank - 'The City Factory' (La Fabrique de la Cité) - was set up by VINCI at the beginning of 2008 to generate ideas about mobility and eco-design. The City Factory brings

together managers of VINCI business lines, researchers, industrialists, elected officials and non-profit organizations. VINCI, in partnership with ParisTech (engineering schools of Mines de Paris, Ponts et Chaussées, Agro), created a Chair of Eco-design for buildings and infrastructure. This initiative with three universities has an impact on the skills acquired by the students through their understanding and ability to apply innovative environmental design. VINCI signed the UN's Global Compact in 2003. Many of the internal initiatives undertaken by VINCI were launched under the commitment for environmental protection.

The impact on jobs is difficult to measure – particularly as there are only 4 people employed in the sustainable development team. Furthermore, VINCI is a large group of companies and operates within a sector which is still seeing sustained demand. There are a number of factors affecting job growth and this makes it difficult to attribute any job creation or retention to a particular policy driver. Demand from clients for more eco-efficient projects and developments is increasing and VINCI is able to respond to this. The group has taken a proactive approach to making clients more aware through the presentation of its new tools and methods. This could have an indirect positive impact on the safeguarding of jobs.

The impact on skills is likely to be greater through the group's requirement for its employees to think more holistically. Engineers must take into account improved energy performance and the carbon footprint within each of their projects – at all levels and in every profession covered by the group. Technology and management skills are integrated, creating leadership better suited to meeting the challenges presented by climate change policy. Links with engineering universities will have an effect on the skills of emerging graduates, in addition to the on-the-job training which the group performs and regular management level meetings on climate change related issues. Some of the other ways in which VINCI upskilling its employees are:

- by providing managers with updated information on the regulatory regime and new methodologies so that they have a clear understanding of climate change policy and tools to tackle the associated issues;
- by introducing training packages for employees by profession and by level which integrates the environment and sustainable development;
- by encouraging and rewarding innovation through the bi-annual VINCI Innovation Awards which in turn indirectly improves skills.

The group anticipates that regulations will strengthen, and that there will be further regulations. This is welcomed, as VINCI believe that this will create market opportunities which the group, through its development of innovative environmental solutions, will be in a position to make the most of.

Lessons learnt from the way VINCI has responded to climate change drivers are summarised below:

- Integration of carbon emission reduction strategies within all areas of the business
- Frequent communication of the latest climate change policies, risks and tools at management level and dissemination across all professions and countries within the group through the network of correspondents.
- Use of innovation and research both internally and externally to keep making progress and improving tools to combat climate change.
- Constantly refining and creating new tools to measure and improve carbon efficiency.
- Involving all employees in the process of awareness-raising and showing them how they can make a difference.

- Participation in forming new regulations (e.g. participation at the Grenelle Environment Forum) and anticipation of future change in regulations by looking at how the group's activities will respond to this.
- Involving customers and suppliers in improving energy efficiency and reducing overall carbon emissions.
- Anticipating the changing skills requirements through on-the-job training and partnership with three engineering universities.

13.2 Introduction

VINCI, which has headquarters in France, is the world number one construction and concessions group. In 2000, the company SGE was renamed VINCI and came together with the GTM group to form the VINCI Group that exists today. The VINCI group has many different subsidiary companies operating under the name. As a result, the structure is particularly decentralised, with each subsidiary running its own business.

As at end of 2008, the group had 164,000 employees worldwide, 139,000 of which work in Europe. Turnover for 2008 was €33.5 billion, with a profit of €1,591 million. There were 246,000 ongoing work sites.

The business is grouped around 4 different areas:

VINCI Concessions: VINCI is allegedly the European number one operator of transport infrastructure concessions. It draws on its expertise in project design, structuring, engineering, financing and turnkey construction to build and operate transport infrastructure (motorways, bridges, tunnels, car parks and airports) under long-term concession contracts or public-private partnerships. Its two areas of expertise as builder and concession operator are also applied to major public facilities such as the Stade de France.

VINCI Energies is market leader in France and a major player in Europe in energy and information technology services, providing the interface between manufacturers and users. Operating in the energy infrastructure, manufacturing, service and telecommunications sectors, VINCI Energies provides services at every stage of a client's projects, from design and engineering to implementation, operation and maintenance.

Roads (Eurovia): Eurovia builds, renovates and maintains road and motorway infrastructure, carries out urban, industrial and retail development projects, and is expanding into complementary environmental and service business activities. Eurovia is also the biggest producer of aggregates in France and one of Europe's major producers of road works materials with 210 quarries, 445 production plants and 134 recycling units. More than 90% of its turnover is in Europe (France, Germany, UK and Central Europe).

VINCI Construction: Is currently the market leader in France and a major player in the world construction market. This part of the group brings together capabilities in building, civil engineering, hydraulic engineering, multi-technical maintenance and services. VINCI Construction also plays a leading role in the world market for major design-build and specialised, technically sophisticated civil engineering projects, as well as dredging.

From its inception in 2000, VINCI has sought to integrate sustainable development (SD) (and within this, carbon emission reductions) within all its operations and its business model. This integration is illustrated by the fact that climate change initiatives and their results feature in the Annual Report, together with financial results. An SD delegation was set up in 2000 with the creation of the group.

13.3 Key climate change policy drivers for change so far

Company Initiative

The Group perceives that one of the general risks inherent to its activities is the need to reassess working methods for the transition to an era requiring a new approach to energy

and as great as possible a reduction in the consumption of energy from non-renewable sources.

A large proportion of global carbon emissions comes from transport and buildings (construction and use). VINCI feel that it is important and in their interests to anticipate the major changes ahead which may arise as a result of climate change. VINCI think that 'existing regulations do not go deep enough in addressing climate change'. There is a need to integrate new climate change risks into the business model. This modifies the traditional way of doing this type of business (construction and infrastructure). VINCI believes that there will be an emergence of a new economic system integrating social and environmental issues. If the group is to remain competitive, it must deal with and anticipate these issues and changes now. VINCI believes that these are not constraints on the business but represent real opportunities for change and to become leaders in their field.

VINCI, in its 2008 Annual report, groups the risks to its business associated with climate change into three categories:

1. Physical risk

- Damage to or delays on projects due to the increasing number of extreme climatic events. A high proportion of VINCI's activities takes place outdoors, exposing employees to weather conditions. In compliance with the laws in force in countries where the group is active, working conditions are highly regulated, notably as concerns temperature variations (low or high). Wider temperature variations will necessarily lead to further adjustments, undoubtedly involving implementation of techniques developed from activities carried out in countries with far less temperate weather conditions than in France.
- VINCI's business involves financing, designing, building and managing public infrastructure projects: schools, hospitals, housing, offices, roads, bridges, urban development, telecommunications and energy networks, motorways and car parks. Climate change may affect these structures and infrastructures. Physical risks such as premature deterioration of structures due to pollution, flooding, storms, extreme heat, etc. are identified.

2. Regulatory risk

This will be in the shape of a strengthening of international, European and national regulations to reduce greenhouse gases.

- VINCI falls under the remit of the NRE (Nouvelles Régulations Economiques) law in France, which requires that listed companies must provide data on the social and environmental consequences of their activities. Currently, one VINCI (Eurovia) facility is covered by the EU Emissions Trading Scheme. Around 18,000 tonnes of CO₂ allowances were sold in 2008.
- VINCI anticipates the emergence of new regulations, notably as a result of the Grenelle Environment Forum. This initiative carried out in 2007 brought together stakeholders from government, the private sector and civil society to define the key points of government policy on ecological and sustainable development issues for the coming five years. VINCI welcomes new public regulations on climate change as an opportunity to create new markets, i.e. it considers that these regulations will facilitate the emergence of new market opportunities.
- The new regulations should, in effect, lead to the emergence of more responsible demand and hence create market openings for VINCI group companies. Already, in France, the implementation of RT (Réglementation Thermique) 2005 for new buildings has had a substantial effect on performance. The RT regulation has a fixed energy consumption threshold which new buildings must not exceed. VINCI companies are now investing in projects that already integrate RT 2010.

- VINCI is anticipating the possible extension of carbon cap and trade systems to a wider range of sectors by investing in research and development.

3. Competition risk

- These might come about through demand from customers for products and processes which are more energy efficient. However, VINCI believe that through their pro-active approach and innovative solutions, they will have anticipated this demand.
- Demand from clients (internationally as well as in Europe) is beginning to emerge for more innovative projects which take into account energy consumption. New demands will necessarily feed through into calls for tender. As customers become more sensitised to the issues of climate change, the increase in demand for such services will result in an increase in the demand for complex products and processes. VINCI companies are anticipating this growing demand.

13.4 What has the company been doing so far?

13.4.1 Internal actions and measures

1. Diagnostic actions

Carbon impact assessment

VINCI monitors its greenhouse gas emissions and quantifies them for its business activity in France and abroad. The method used is based on the international ISO 14064 standard. It draws on the French carbon assessment method, the Bilan Carbone®, a method developed by the ADEME (the French environment and energy management agency). The various VINCI entities meet regularly to harmonise their calculation methods, and they report back on these meetings to the CO₂ pivot club (more on this under the Internal Measures section below).

The following elements are quantified in accordance with ISO 14064:

- emissions caused by using fossil fuels and electricity at fixed sites and worksites
- direct emissions from the vehicle fleet, for both employee and freight transport
- non-combustion related emissions, mainly lime decarbonation at Eurovia's lime plants
- nitrous oxide emissions from the use of nitrogen fertilisers for the maintenance of motorway landscaped areas.

According to the ISO 14064 Scope 2 measurement protocol, the greenhouse gas emissions attributable to VINCI companies in France amounts to around 1 million tonnes of CO₂ equivalent. Some 77% of these emissions are attributable to road building (Eurovia), while the remainder is spread between VINCI Construction (12%), VINCI Concessions (5%) and VINCI Energies (6%). Extrapolating this to VINCI's operations worldwide leads to an estimated 2 million tonnes of CO₂ equivalent in emissions.

The very high percentage of the roads business (Eurovia - 77%) in VINCI's ISO Scope 2 emissions is due to the nature of this activity, which generates much higher levels of CO₂ than the Group's other activities. Eurovia operates a lime works, produces 13 million tonnes of asphalt mix in its plants and has a large fleet of site machines. VINCI is aware of the need to compare emissions by type of activity and not in absolute terms. The detailed analysis of GHG emissions has given each business line a basis for implementing a specific action plan to reduce GHG emissions.

This broader approach identifies the highest emission sources, making it possible to consult with suppliers to reduce the associated GHG emissions.

2. *Internal management*

The VINCI goal is to combine economic performance with humanistic social policy, which underpins their Sustainable Development Programme. This is built around 5 priority commitments one of which is:

“To quantify greenhouse gas emissions by identifying the biggest sources of emissions and reducing them wherever possible.”

- VINCI appointed a delegation (or team) responsible for sustainable development in 2000, an extremely streamlined structure at central management level. It has specific responsibility for climate change policy, and also for research, development and innovation policy. Reporting to the executive committee, its task is to drive forward the programme and ensure that the guidelines set by the sustainable development committee are applied. The SD Team strengthened its climate expertise in 2007 by recruiting an experienced scientist. VINCI's Audit Director, who is also a member of the Group's Sustainable Development committee, monitors the risks committee, which assesses external factors.
- The **Sustainable Development Committee** is made up of 20 people covering all aspects of VINCI's activities. Committee membership is made up of appropriately qualified individuals nominated by each division's management, a representative of the corporate human resources division, the director of the audit department and the director of the central purchasing coordination unit. The committee met five times in 2007.
- This structure is supported by a **network of correspondents and coordinators** in the various subsidiaries. The main network of sustainable development correspondents (excluding social and environmental reporting) currently consists of more than 300 people. The sustainable development committee coordinates the network of correspondents and organises technical working groups, bringing together experts from each business. These working groups look at themes such as CO₂, health and the environment, carbon audit, training for managers, wind power and solar power.
- Implementation of the environmental policy is supported by a strong commitment from VINCI's management, the 'empowerment of all employees' in its companies and constant dialogue with stakeholders. In 2007, following the management convention at which climate change was one of the main topics addressed, VINCI established a **CO₂ pivot club**. This working group, comprised of operations managers, directs and coordinates projects concerning the reduction of greenhouse gas emissions. It meets every two months.

3. *Actions to reduce the carbon footprint of the group's activities*

Solutions to reduce the emission of greenhouse gases (GHGs) have been identified at group level. These range from adapting construction methods to improving environmental performances over the long term.

Use of materials

- In its earthworks activities, VINCI is active in the creation and maintenance of foundations, ports and dikes. Existing teams have already integrated climate change in their training programmes. Managers already have or are devising technologies and materials that can sustainably withstand the effects of climate change.

Use of local resources

- VINCI Construction Grands Projets gives precedence to using local resources on its sites in order to reduce the CO₂ emissions generated by transport. During the construction of the Naga Hammadi dam in Egypt, for instance, the company avoided

around 10,000 tonnes of CO₂ emissions by using aggregate from a quarry near the site.

Use of renewable energy

- The proportion of electricity purchased from renewable energy sources is not consolidated at Group level, since it is managed by each operating unit. VINCI companies use renewable energies and techniques to improve energy efficiency. For instance, the concessions activity has installed over 4,000 renewable energy devices (heat pumps, photovoltaic panels, solar heating, etc.). Some 10% of VINCI Park sites are equipped with electric car recharging facilities.
- At VINCI PLC (the UK arm of the Group), 46% of energy purchased comes from renewables (1.9 GWh of the 4.1 GWh used).

4. Providing eco-efficient solutions for clients

Some of the factors that help improve the environmental performance of the services VINCI provides are set out below.

Development of measurement tools:

VINCI strongly believe that taking a responsible approach to climate change requires a CO₂ life-cycle analysis of each of its projects/developments (from design, construction, operation, maintenance, to deconstruction). This approach allows each of the actors in the chain to be responsible from conception to implementation and use in order to reduce the environmental impacts. A major impact from this is that life-cycle analysis is now being integrated into a vast number of projects, especially Public Private Partnerships (PPP). Integration of life-cycle analysis modifies the entire construction chain, with greater responsibility placed on each of the actors, and feedback between each of them.

The use phase of a building/infrastructure project generates most of the carbon emissions (90%) in the project's lifetime. It is therefore important to educate the end-user in how to reduce their carbon impact. VINCI companies are developing tools to help assess and reduce energy consumption at each stage of the life cycle:

- One of the group's subsidiaries, Freyssinet, has developed a "**sustainable technology**" approach, which measures the environmental added value of products and processes developed by the company. The CO₂ savings thus generated - and flagged in the company's bids - are seen as a competitive advantage by clients but also by the new generation of employees, who are considered to be more sensitive to environmental issues.
- VINCI Construction, in partnership with engineering school Ecole des Mines de Paris, has developed Equer, a computer programme for evaluating a building's energy efficiency. This Equer software tool is based on the life-cycle analysis of a building from construction, operation and renovation through to demolition. Equer is designed to guide design choices and lead to the development of eco-efficient buildings. In France, this tool has attracted particular interest from the CSTB (Centre Scientifique et Technique du Bâtiment) and may become a market standard. VINCI is currently working on developing an eco-design label for buildings using the Equer method. It subsequently hopes to extend the Equer method to urban development projects, associated with a label. The goal of this work is to factor in the negative external factors of a city without neglecting the functional aspects.
- Eurovia has designed the **Gaia.BE** environmental comparison software as a way of highlighting the environmental value added of its products and services. The system enables contracting authorities to assess the environmental impact of their worksite by comparing conventional techniques with those developed by Eurovia. Developed jointly by researchers and operations managers, this system is already in use across France and worldwide rollout is currently being considered. Based on the principles

of life cycle analysis at each stage in the construction site, from raw material extraction in quarries through to compaction of the wearing course, Gaïa.BE models the environmental impact of natural resource and energy consumption, pollution emissions, waste generated and protection of the living conditions of nearby residents, etc. The standard used was based on public data recognised by the roadworks industry. It is also used as a training tool to raise Eurovia employees' awareness of the role they can play in combating climate change.

- At the beginning of 2007, VINCI companies embarked on an R&D programme to measure global performance in home and office environments and eco-design. This work aims to:
 - Fine-tune data (the extent to which current climate data can be extrapolated to the future, the extent to which micro-climates should be taken into account, for instance).
 - build up databases on the physical and environmental characteristics of the main construction products.
 - model occupants' behaviour (choice of heating and air-conditioning temperatures, opening of windows, management of lighting and sun protection, etc.) in both office and residential buildings.
- Extension of this approach to eco-buildings, eco-communities and eco-towns creates new possibilities for improving environmental performance by factoring in more global aspects such as street layout, implementation of appropriate technologies for public spaces and pooling of equipment, e.g. heating networks.

Renewable energy services

- In response to the significant growth in the market for wind power, VINCI has implemented a coordinated approach between the dozen companies which make up its wind energy club. Their approach is aimed at developing turnkey offers including site location, construction and maintenance of wind farms. On the same model, prompted by VINCI Energies, a photovoltaic club has been tasked in particular with identifying possible sites for solar energy farms.
- At VINCI Energies, reduction in GHG emissions brings into play expertise in energy efficiency and greater use of renewable energies in projects where the group has design and operating control. The solutions implemented by VINCI Energies in the new PPP for public lighting and traffic regulation in the city of Rouen generated savings of 28%, and in Saumur, photovoltaic energy meets 8% of the municipality's energy requirements. The aim is to step up the number of projects of this type in Europe.

5. Research and Development (R&D)

VINCI has invested in an R&D team to investigate innovative solutions, which involves 45 research programmes in the different VINCI entities and professions at a budget of €30 million. More than 180 researchers and scientists are employed by VINCI, as well as approximately 20 PhDs within these teams. An R&D and Innovations Committee facilitates information exchanges on the research projects.

VINCI has also set up an innovation prize, which runs every 2 years and is open to its employees. This is aimed at driving the search for innovative solutions to environmental and climate change problems. There are several categories of prizes, including a special prize in sustainable development. In 2007, one of the prizes went to a solar powered radiotelephonic relay station, with a battery which had a 10 day storage capacity (allowing the relay station to function for 10 days with no sun).

Investment in environmental initiatives for the group as a whole is unknown as the numbers are not consolidated. Because tackling climate change has been integrated into a new approach to the business, the amount of investment is difficult to quantify. The increasing size of the group and continual demand for its services may also mean that such investment is more easily absorbed.

13.4.2 External actions and measures

1. Supplier Initiatives

The nature of construction - which does not make a product as such but uses materials to build things - is such that purchases of materials from suppliers comprise a large element of the business. In 2008, purchases represented around 60% of VINCI's turnover, of which €8.3 billion were materials and €12.1 billion were external services including sub-contractors. What has changed is that VINCI is now looking to its suppliers to understand how they are anticipating future changes. Previously purchase prices used to be fixed, although there is now more negotiation.

VINCI encourages its buyers to include the issue of reducing greenhouse gas (GHG) emissions in their dealings with suppliers in order to identify their best practices and support their efforts in this area. The ultimate aim is to develop mutually agreed tangible actions - at local level or on a broader scale - that reduce the total quantity of GHG generated, through the partnership between VINCI subsidiaries and their suppliers. VINCI is encouraging its suppliers and sub-contractors to provide clear information on the environmental impact of their products and to invest more in R&D so as to propose products that are truly innovative in terms of environmental impact. For instance, VINCI Construction expects its concrete suppliers (concrete accounts for 60% of VINCI Construction's GHG emissions) to work with it to provide systematic information about the emissions of the concrete supplied and in fundamental innovation in this particularly high-impact area.

2. Emissions generated by VINCI customers

The greatest potential reductions in greenhouse gas emissions available to VINCI are in the emissions generated by its customers, rather than its own activity. The users of its motorways generate 400 times more GHG than are generated by VINCI as a motorway concessionaire. For this reason, all VINCI concession companies attempt to communicate actively with their customers motorway and driving practices: such as the adoption of smooth driving techniques (eco-driving), correct tyre pressure, and work with Eurovia to optimise wearing courses.

Dynamic speed regulation systems are being widely adopted, one example being the system rolled out by one concessions company on a French motorway which saves around 1,000 tonnes of CO₂ a year on this section and lowers polluting emissions by 5% to 10%. Flexible pricing, to be implemented by Cofiroute (another concessionary) on the opening of a motorway tunnel will lead to more fluid traffic flows. The opening of the tunnel is estimated to have generated savings of 164 tonnes of CO₂ a day, or almost 60,000 tonnes of CO₂ a year.

Client impact is also significant in construction: users of a building emit 10 times more GHG than its builders. As a building designer, VINCI has a role to play through eco-design of built environments.

3. Initiatives with external bodies

VINCI works actively and widely with a range of external partners and stakeholders. The main initiatives are listed below.

- Participation in the working group on "Buildings and Greenhouse Gases" with EpE (Entreprises pour l'Environnement).

- Participation in many industry symposiums on the 'City Of Tomorrow' and sustainable development.
- Creation of The City Factory (La Fabrique de la Cité), a think tank set up by VINCI at the beginning of 2008 to generate ideas about mobility and eco-design. The City Factory brings together managers of VINCI business lines, researchers, industrialists, elected officials and non-profit organizations.
- VINCI contributed to the work of Medef (employers' federation) at the Grenelle de L'Environnement forum, notably in the "Construction" and "Transport" workshops. Yves-Thibault de Silguy, Chairman of VINCI, chaired the working group entitled "Promoting modes of ecological development favourable to competitiveness and employment."
- VINCI's Chairman, Chief Executive Officer, operations managers and Sustainable Development Delegation contribute to public debate around methods for combating climate change through conferences, symposiums and other public events.
- Creation of the Chair of Eco-design for buildings and infrastructure with ParisTech (engineering schools of Mines de Paris, Ponts et Chaussées, Agro). This initiative with three universities has an impact on the skills acquired by the students through their understanding and ability to apply innovative environmental design. This in turn will increase their value as future employees and assist in access to jobs and filling any skills gap. VINCI thus believes it has made an investment and had an impact on the skills of future generations of engineers and potentially employees.
- VINCI Construction France, in partnership with the engineering school Ecole Centrale de Nantes, is developing concrete in which the cement (a product that emits high levels of CO₂) content is lower and partially replaced by other products. While the practice of replacement is not new, this research aims to improve both the resistance and durability of the concretes obtained and implementation procedures.
- Eurovia has been a partner since 2006 in one of the first projects selected by the French Agency for Industrial Innovation (AII). This is the Bio-Hub programme, which aims to develop new "green chemistry" cereal-based biorefineries as a way of lowering oil consumption and greenhouse gas emissions.

VINCI Construction is a signatory to the FIEC (Federation of European Construction Industry) Charter drawn up in 1992. It includes all affiliated member federations and organizations of contractor companies in Europe (in France these are FNB (National Federation of Construction) and FNTP (National Federation of Public Works)). In the context of strong contractor growth in Europe, its aim is to establish quality relations between the project owner, the contractor and its partners (notably its sub-contractors), to guarantee 'better economics for building', and better overall project quality. The Charter defines the expertise and principles governing the use of contracts by contractors, the rules of conduct to which the member contractors individually subscribe, and the principle of a Charter Observance Council in each of the member states.

VINCI signed the UN's Global Compact in 2003. Participation has led to concrete actions being taken, as featured on the United Nations website⁴⁷. In 2007, VINCI joined the Forum of Friends of the Global Compact in France, and participated in the UN's Global Compact summit in Geneva. Under the commitment for environmental protection, many of the internal initiatives described under 'Internal Measures' above were launched:

- Awareness raising campaign on climate change issues for the Group's 300 top managers
- Carbon audit of VINCI 's activities in France (ISO 14064)

⁴⁷ <http://www.unglobalcompact.org/>

- Carbon footprint assessment quiz for employees on the intranet
- Various group companies participated in the Grenelle Environment Forum
- Development of software packages for measuring the energy efficiency of buildings and structures
- Creation of R&D programmes on performance guidelines for eco-communities and eco-cities
- Launch of The City Factory

Despite increasing public pressure and interest from government, VINCI perceives that the demand expressed for solutions integrating "climate risk" is still very much ahead of the actual demand from clients. This is due less to technological reasons – manufacturers are releasing effective eco-designed products in the market – than to economic concerns. The return on investment as a ratio of the initial extra cost for the structure is often considered as insufficient in an approach that is still heavily focused on construction without sufficiently taking into account the subsequent operation of the projects. The group's companies are working on this issue with all their industry partners, notably trade organisations. Their aim is to integrate climate change in their business plans by building economically viable eco-efficient products and services.

13.5 Impact on company performance

The effect of climate change policy drivers on sales and profitability is difficult to assess due to a wide range of factors responsible for the company's improved performance. The demand for its products and services has been increasing over time. However, VINCI believe that if their offer is considered more innovative and 'ahead of other competitors', this will be able to meet and generate demand and therefore have a positive impact on sales and profitability. At a global level, VINCI is attempting to raise client/customer awareness and 'wants to make products which will allow their clients to make the right decisions'.

The impact on investor confidence has been positive. In 2008, because of progress made in quantifying CO₂ emissions and of eco conceptions, VINCI was integrated in the Dow Jones Sustainable Index World (DJSI World), which selects amongst the world's top 2000 largest listed companies, the top 10% of responsible companies. The Carbon Disclosure Project investors awarded it 'first place' in its category for work done to tackle climate change.

Competition from outside the EU is not perceived as an issue. The group's general strategy to stay ahead of the competition through innovation and forward thinking on climate change issues has had a positive impact on the VINCI's competitive advantage in the EU and internationally.

Impact on customer relations is perceived as positive: VINCI sees itself as helping clients to become more aware of climate change issues in the way they look at project conception, and are able to respond to customer demand for more energy efficient development.

13.6 Impact on jobs and skills

13.6.1 Impact on jobs

VINCI does not perceive that there is a direct impact on jobs from actions to address climate change policy, as there is always a demand for its services. Since the creation of the SD strategy in 2000, 4 jobs have been created in the SD team. However, through its actions and strategy to tackle climate change through innovative building and infrastructure solutions, it appears that VINCI has been able to stay ahead of its competitors, at least in the first instance. This may have had an indirect impact on the number of jobs that it has been able to sustain.

Again, the size of the group and range and number of companies that make up VINCI could also be a significant factor in its success.

What is clear is that the new economy that is starting to emerge behind the carbon issue is seen as a great business opportunity for VINCI. According to the group, some observers predict '40 years of prosperity for the construction industry and 100,000 new jobs in France alone, with the emergence of new job profiles and business lines'⁴⁸.

13.6.2 **Impact on skills**

The group perceives that its activities have a much greater impact on skills than jobs.

Training takes place at all levels and for each of the different engineering and construction professions. The aim is for all staff to become aware of climate change issues and how these impact on the way they carry out their work. Some of the main ways the company is developing skills across its workforce include:

- **Climate strategy training for managers** - The development of new solutions requires the subsidiaries and teams to comprehensively re-engineer their construction methods and re-think their professional practices. They will have to introduce new parameters into their production and distribution cycles, and look at how they use resources. Systems encouraging managers to undertake this approach are currently being developed (company intranets, training courses, research programmes, etc.).
- **Raising employee awareness** - All employees are being encouraged to review their methods. Each VINCI business line is introducing additional methods to raise awareness and share best practices. In construction, the many methods identified have been arranged in four categories:
 - 1) compliance with best working practices on worksites and in offices (keeping heating and air conditioning on a moderate setting, water and paper savings, smooth driving, etc.)
 - 2) use of materials that generate lower emissions than conventional solutions
 - 3) development of eco-design systems integrating environmental impacts in general - and CO₂ emissions in particular – throughout the structure's life cycle
 - 4) development of new products and services, notably in the area of low CO₂ emitting renewable energies (offshore wind, photovoltaic, etc.), providing new growth opportunities for VINCI companies.
- VINCI companies have continued their environmental training efforts, with a significant increase (17%) in the number of hours provided. In 2007, actions to raise awareness that lasted less than one day (e.g. the 15-minute environment meetings on worksites) were included for the first time.
- Close links with research institutions and universities means that new design solutions are being taught to the next generation of engineers who therefore have the required skills to work at a VINCI company and other forward-thinking firms in the sector.
- Managers are regularly kept informed of the regulatory regime and new methodologies so that they have a clear understanding of climate change policy and tools to tackle the associated issues. Technology and management skills are integrated, creating leadership better suited to meeting the challenges presented by climate change policy.

⁴⁸ CDP6 response

- A training package has been put in place for employees by profession and by level which integrates the environment and sustainable development.
- Innovation is encouraged and rewarded through the bi-annual VINCI Innovation Awards which in turn improves skills.

The skills within the group have been “reformatted”. There has been a reengineering of jobs, even a paradigm shift. A new perception of the job is required. Employees need to think more holistically and take into account the social and environmental dimensions of the work they carry out. This does not mean that additional jobs are created but that existing jobs have changed.

The decentralised nature of the group means that each arm has its own business model and so there are no systematic training programmes for suppliers. However, the UK arm of VINCI, VINCI plc, provides supplier training for raising awareness of climate change issues.

13.7 Future implications of climate policy drivers

The group anticipates that regulations will strengthen, and that there will be further regulations. This is welcomed, as VINCI believe that this will create market opportunities which the group will be in a position to make the most of. For example, many requirements for improved eco-efficiency currently apply to new buildings only. However, the challenge is to expand this type of approach to existing buildings, which account for 97% of the base. Projects carried out by VINCI on existing building stock show that the additional cost involved in zero-carbon construction and renovation of such buildings is not as high as has been previously estimated and the length of time to return on investment is now more attractive. VINCI believe that the trend for environmental improvements of existing buildings will gather pace significantly with new tax incentives for homeowners and tightening of regulations.

VINCI currently believe they are ahead in terms of the services they are able to provide, but that there is always ‘progress to be made’.

In the medium term, VINCI will seek to refine its existing tools so that they are more harmonised across the different companies and countries. There is also a plan to assess indirect carbon emissions. The group anticipates that it will finance and put in place contracts on the energy markets.

13.8 Lessons for other companies and sectors

VINCI is unusual in that it is an extremely large business both in terms of employees, scope and turnover. Some of the activities and initiatives it has undertaken may be more difficult and costly for smaller companies to carry out and may not be so transferable:

- Integration of carbon emission reduction strategy within all areas of the business
- Frequent and thorough communication of the latest climate change policies, risks and tools at management level and dissemination across all professions and countries within the group through the network of correspondents.
- Use of innovation and research both internally and externally to keep making progress and improving tools to combat climate change.
- Constantly refining and creating new tools to measure and improve carbon efficiency.
- Involving all employees in the process of awareness and showing them how they can make a difference.
- Participation in forming new regulations (e.g. participation at the Grenelle Environment Forum) and anticipation of future change in regulations by looking at how the group’s activities will respond to this.

- Involving customers and suppliers in improving energy efficiency and reducing overall carbon emissions.
- Anticipating the changing skills requirements through on-the-job training and partnership with three engineering universities.

14 CASE STUDY 12: AIR-FRANCE KLM

14.1 Summary

Air France-KLM comprises a holding company which controls two airlines, Air France and KLM, each of which retains its own separate identity and brands. The group is the world's largest air transport group in terms of revenue (€24.1 billion in 2007-08), second largest in terms of air traffic (in passenger-km) and cargo (ton freight-km), and third largest in terms of maintenance revenue. The group employs 104,659 people (FTE).

Air France KLM has taken a number of initiatives to comply with climate change policy drivers. The company is driven by a range of climate change drivers. Market factors such as fluctuating oil prices and increasing consumer perception about airlines' contribution to global warming are the main factors for change. The proposed inclusion of air transport in the EU ETS from 2012 will affect the entire business strategy of the company and lead to a fundamental shift in its functioning.

Given that burning aviation fuel accounts for 99% of its carbon footprint, the company has undertaken a number of measures to comply with climate change policy drivers:

- Fleet planning and replacement (type of air craft, length of routes, etc.)
- Fuel saving measures both ground based and in-flight
- Working closely with external stakeholders and EU authorities
- Education and training of ground, cabin crew and pilots
- Generally include climate change and sustainability in its core business activities

The company is also working with external stakeholders, such as European authorities, Air Traffic Management Companies and Airport Authorities to share best practices and ensure a coordinated approach.

The company believes investment in new planes such as the Airbus A380 will create new jobs as well as upskill existing jobs due to the fundamental differences in operating and maintaining the plane. Though exact job figures are difficult to quantify. Overall, both internal and external measures will involve substantial training and upskilling of ground staff, cabin crew and pilots.

Air France KLM is already an important regional employer and the measures in place and planned to comply with climate change policy drivers will help create/sustain jobs.

The company has concerns if aviation is included in the EU ETS from 2012 in its current form. This could create an unlevel playing field undermining the competitiveness of the European airline industry.

Overall, climate change is increasingly becoming an important part of the company's annual leadership meetings.

14.2 Introduction

Air France-KLM comprises a holding company which controls two airlines, Air France and KLM, each of which retains its own separate identity and brands. The group is the world's largest air transport group in terms of revenue, second largest in terms of air traffic (in passenger-km) and cargo (ton freight-km), and third largest in terms of maintenance revenue. The group generated revenues of €24.1 billion in 2007-08 and employees 104,659 people (FTE).

Passenger transport is the largest of the group's three core businesses, generating around 80% of its revenues (as of 31 March 2008), with 74.8 million passengers carried. Air France-KLM Cargo ranks first worldwide among air freight carriers (excluding integrators).

Each airline has a stronger presence than the other in certain parts of the world, which is why many destinations are served by just one. Serving 114 long-haul destinations, Air France-KLM offers connectivity to most of the world and has the most extensive network of all its leading European competitors, including British Airways (71 destinations) and Lufthansa-Swiss (85 destinations).

14.3 Key climate change policy drivers for change so far

14.3.1 Market drivers

Increasing fuel efficiency is an ongoing driver for the industry. High fuel prices and climate change momentum is helping the company to pursue win-win solutions. Faced with soaring oil prices, international economic instability, and signs of waning demand, air transport has entered a period of great uncertainty. People increasingly perceive Airlines as a major contributor to climate change even though currently it is responsible for only 2-3% of global CO₂ emissions⁴⁹. Air France KLM thus consider managing the CO₂ footprint not just as a compliance issue but also a strategic issue.

14.3.2 Political and regulatory context

Under the terms of the Kyoto Protocol, the International Civil Aviation Organization (ICAO) was asked to submit proposals concerning international air transport and climate change. Its proposals will be available in June 2009. The ICAO currently considers that a worldwide emissions trading system would be the best economic measure which would enable the air transport sector to contribute to an effective reduction in global CO₂ emissions.

In Europe, the draft Directive aimed at including the air transport sector in the emissions trading system launched in 2005 for fixed sources (EU-ETS) was finalised in January 2009⁵⁰. Please see section 13.7 for detailed discussion on the implications of including airlines in the EU ETS from 2013.

In France, as part of the "Grenelle de l'Environnement" (Environmental Roundtable), Air France signed the Air Transport Sector Commitment Agreement with the French state in January 2008 committing to pursue a fleet modernization plan and to reduce CO₂ emissions. This will call for an annual investment of €2 billion in the years ahead aiming to achieve several reduction targets for its absolute emissions and an improvement in its energy efficiency of around 7% by 2012 (3.7 litres/passenger/100km).

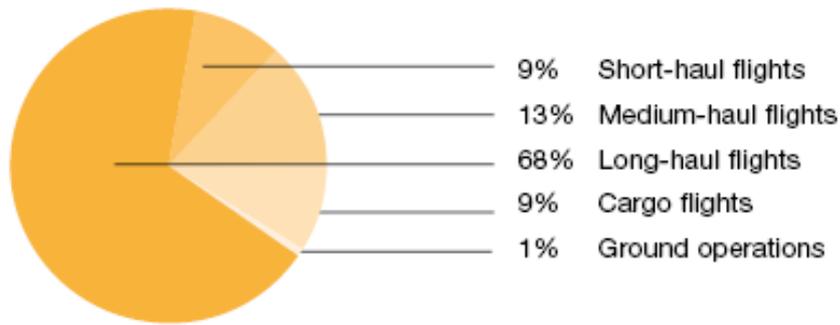
14.4 What has the company been doing so far?

Burning aviation fuel accounts for 99% of the company's carbon footprint (Figure 14.1 and 14.2 below). At Air France-KLM, long-haul (including cargo) flights (about 20% of flights) account for 77% of CO₂ emissions. For these long-distance journeys, where there is no alternative to passenger air transport, consumption per passenger amounts to 3.3 litres of jetfuel per 100 km. Short-haul flights account for 9% of CO₂ emissions. They generate more emissions per passenger kilometre, but contribute to overall airline efficiency by carrying passengers to their Paris-CDG and Amsterdam Schiphol hubs. These may be compared with a carpool system in which many smaller traffic flows converge from all over Europe and then travel to more distant destinations using bigger aircraft with higher seat occupancy rates and hence with a lower environmental impact per passenger.

⁴⁹ IPCC Fourth Assessment Report / technical summary (<http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-ts.pdf> p.49), 2007 And giec-aie 2005

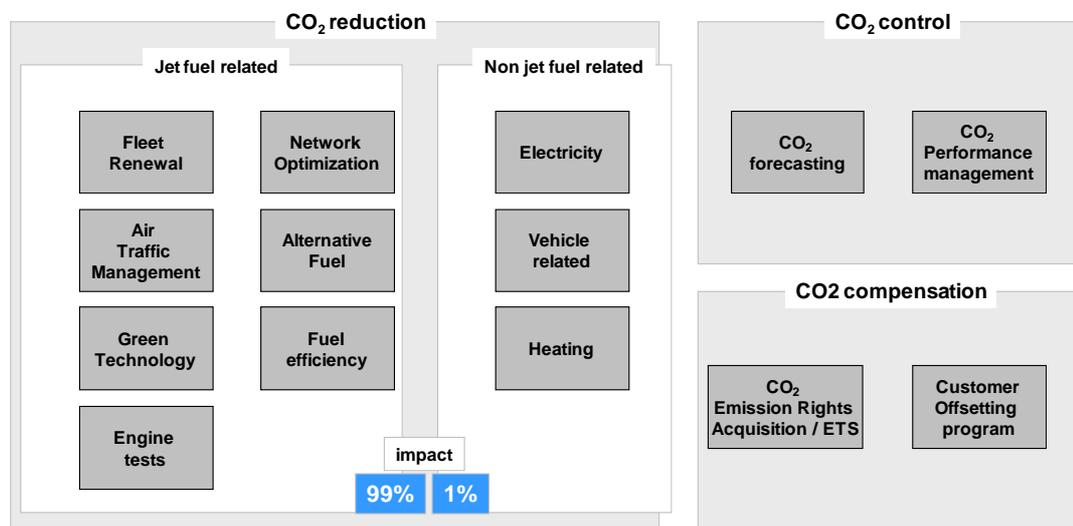
⁵⁰ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008L0101:EN:NOT>

Figure 14.1: Breakdown of Air France and KLM CO₂ Emissions (including subsidiaries)



Source: Air France KLM

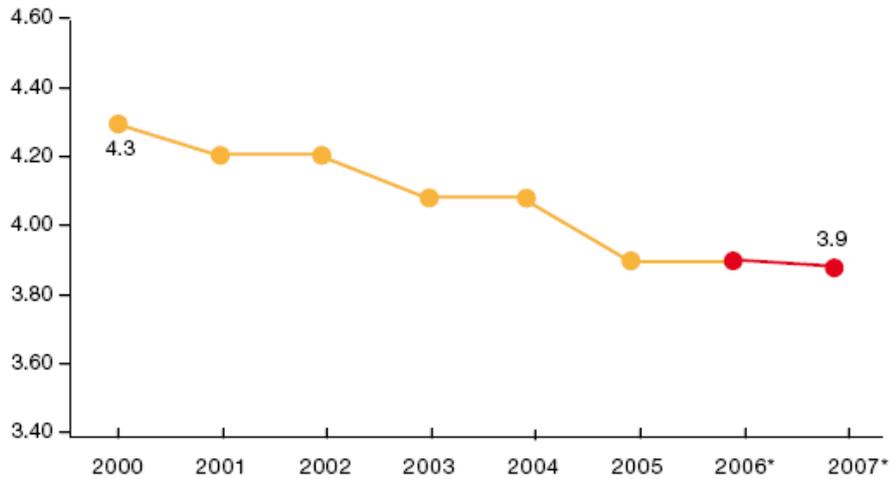
Figure 14.2: CO₂ Diagnostic action (carbon risk assessment and management)



Source: Air France KLM

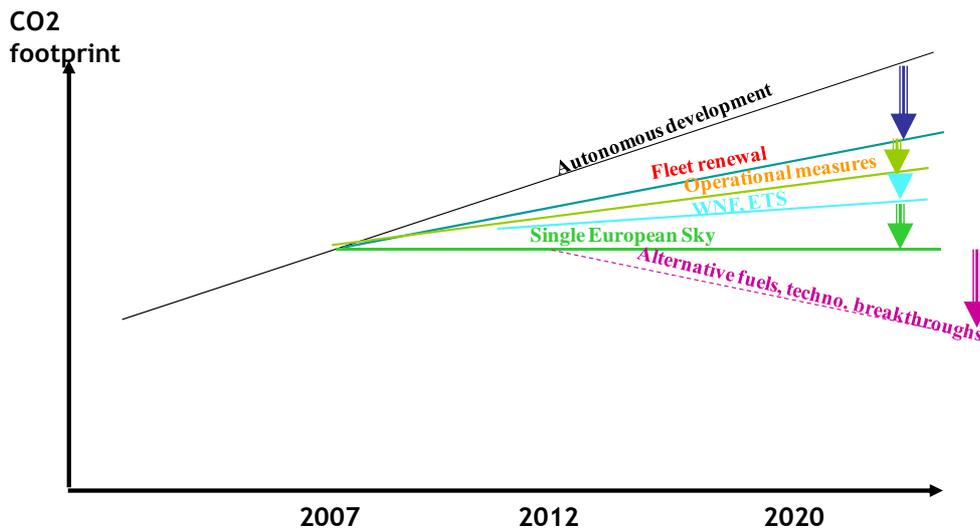
One tonne of aviation fuel emits around 3.15 tonnes of CO₂. The company's fuel efficiency has increased by 9% from 4.3 litres per passenger km in 2000 to 3.9 in 2007 (Figure 14.3). The company has a target to reduce 2006's average fuel consumption per passenger from 3.95 litres per 100 km, to 3.7 litres in 2012, which translates to a target of 95 grams of CO₂/km per passenger. The company has taken a number of internal and external measures to reduce CO₂ emissions (Figure 14.4).

Figure 14.3: Air France-KLM fuel efficiency (litre per passenger-kilometre)



There are five main ways under which initiatives to reduce CO₂ emissions have been taken and will continue to do so (Figure 14.4). The European Commission plans to integrate air transport into the European ETS (2012). This will create targets for the reduction of CO₂ emissions using the initiatives listed below. This would also mean an additional financial burden for companies.

Figure 14.4: Reducing CO₂ is a strategic issue



Source: Air France KLM

14.4.1 Internal measures

1. Fleet modernisation

Replacing old and aging aircrafts with new has the greatest potential to reduce CO₂ emissions (See Box 14.1). Air France-KLM has an ongoing policy to replace and upgrade its fleet. The modernisation process has reduced its fleet's fuel consumption and specific CO₂ emissions by 12% in the last six years.

Box 14.1 CO₂ savings from fleet replacement

- The new Boeing 777-300 ER achieves 16% CO₂ savings compared with the Boeing 747-400
- Boeing 777-Freighter achieves 18% CO₂ savings compared with the Boeing 747 Cargo
- Airbus 318 achieves 13% CO₂ savings compared with the Boeing 737-500

During the last five years, 85 new aircraft have joined the Air France KLM fleet and 76 have been phased out. This represents an investment of around € 4 billion. In 2007 alone, 14 new aircraft were put into service and 12 older planes were retired. Today, for example, the average age of the Air France KLM long-haul fleet is 7 years, whereas it was 10 years in 1998.

In May 2007, Air France KLM announced a €5 billion plan until 2012 to replace all its Boeing 747s with Boeing 777-300ER aircraft and the new Airbus A320s. The company has ordered 30 of the latest-generation A320s and A321s. Air France KLM has also increased its order for A380s to twelve aircrafts. The first one is scheduled to begin service by late summer 2009.

Between 1998 and 2008, 61% of investment in new long haul aircraft went on fleet renewal (equal seat capacity) and 39% on developing Air France KLM passenger operations (increasing seat capacity).

Fleet replacement, however, requires huge amounts of investment. The company invested around €14 billion between 1998 and 2012. Without this investment, Air France KLM would have burnt 850,000 extra tonnes of aviation fuel in 2008 for the same volume of activity. This would have meant over 2.6 million tonnes of CO₂.

Major European Airlines, such as Air France KLM are currently facing a number of barriers for accessing finance. A recent European Investment Bank (EIB) ruling has excluded financing for airlines under their 'green economy' loans. Airline companies are currently contesting this decision with the EIB. The economic downturn has also affected access to finance. Before the downturn Air France KLM used to work with 25 banks in Europe for aircraft financing, this is now down to 15 banks. Moreover, the remaining banks for internal reasons now require a state guarantee to lend huge sums of money to Air France KLM. The company is unable to obtain this guarantee due to a new OECD agreement which prohibits access to state guarantees (Export Credit Agencies) when a major airline manufacturer (in this case Airbus) is located in the same country.

2. Optimising route and air traffic

Aircrafts waste a considerable amount of fuel due to inefficient route management and incompatible air traffic control systems in various countries. For instance, route optimization could reduce flying distance between Paris and Munich by 33%. A new flight departure system at Paris-Charles de Gaulle planned for 2010 would save 19,000 tonnes of CO₂ per annum.

The company also makes use of modern route management and GPS technology for optimal route management.

3. Reducing in-flight emissions

The lighter the plane, the less fuel it burns and the less CO₂ it emits. Thus, all airline companies aim to reduce in-flight weight as much as possible. Sometimes there is a trade-off between noise regulations and fuel efficiency. Noise reduction requires padding and insulation which can increase the weight of the plane and subsequently its fuel consumption.

Reducing weight of on-board equipment

Air France scrutinizes all its on-board equipment. This ranges from drinking glasses to crew documentation, cabin fittings and meal service supplies. As a result, in autumn 2009, Air France will be phasing in a brand new seat system on short-haul aircraft, which is 4.5 kilos lighter than the current one. This saving will enable Air France to reduce its annual CO₂ emissions by 8,000 tons. Weight is never reduced if it is detrimental to the safety and comfort of passengers. The introduction of new lighter cabin equipment saved 21,000 tonnes of CO₂ in 2008.

Carrying the optimum quantity of fuel

While complying with the European regulations guaranteeing flight safety with fixed minimum quantities of fuel, the captain decides on the amount of fuel he wishes to carry on board according to flight parameters such as the payload (passengers, baggage, freight), fuel consumption statistics, specific characteristics of the route (congestion on arrival or en route) or the weather conditions just 30 minutes before take-off. These are factors which Air France KLM endeavours to evaluate as precisely as possible, so as to be able to carry the optimum quantity of fuel on each flight. Unnecessary jetfuel creates additional weight and therefore overconsumption due to the energy needed to transport the surplus. Air France KLM expects to save 33,000 tonnes of CO₂ by 2010 by optimising fuel quantities.

Adapting flight procedures

Pilots can also reduce CO₂ emissions by applying the most appropriate procedures to use less fuel from taxing to landing and parking: ongoing search for appropriate flight level and speed, flying direct routes, continuous or visual descent approach procedures, taxiing on the ground with one or two engines shut down and utilization of electrical Ground Power Units (GPUs) rather than the aircraft auxiliary power units (APUs) at the parking stand. Air France KLM expects to save 20,000 tonnes of CO₂ by 2010 by limiting the use of APUs.

Fuel-efficient engines

The direct ratio between fuel consumption and the amount of CO₂ emitted implies that improving engine performance reduces CO₂ emissions. On average specific engine fuel consumption falls by about 1% per year for aviation industry. Fuel consumption has dropped by about 20% when comparing the CF6-50 engine on the Boeing 747-200 in 1979 and the GE90 engines powering the Boeing 777 in 2001.

4. Reducing ground level emissions

Air France KLM have a number measures in place for maximizing energy efficiency in buildings and ground equipment. Air France and KLM are improving the energy performance of their premises and ground equipment. The group is helping to draft standards on the subject. The group is also investing in the search for renewable energy solutions. By 2010, KLM intends to fit solar panels to two of its hangars at Schiphol Airport. In 2008, Air France plans to install solar panels at Paris-Charles de Gaulle to generate energy needed to heat half of its water at its industrial site. Air France is also researching the possibility of installing solar panels to generate electricity for its IT centre.

Air France and KLM also intend to reduce energy consumption in the buildings by renovating them according to High Environmental Quality (HEQ) standards.

Air France is replacing its fleet of internal combustion-driven ground equipment with electric vehicles, with a target of a 60% electric fleet by 2020.

As of January 1, 2009 KLM in the Netherlands will purchase only renewable energy. Every year, KLM uses about 100,000 MWh of energy, equivalent to 25,000 households. This amount will be purchased entirely from hydropower plants over the coming two years.

14.4.2 External measures

1. Optimising routes with external partners

Europe is currently experiencing air traffic congestion, leading to significant delays, increased costs and CO₂ emissions. This is partly a result of the fragmentation of airspace and of the air traffic control process. There is considerable room for improvement. For 10 million flights a year, it is estimated that the actual route flown is 5% longer than ideal. For some routes, such as Amsterdam-Zürich, it is even 20%. The annual cost of fragmented European skies is estimated at €3.4 billion.

The Single European Sky and SESAR (Single European Sky ATM Research) will modernize and harmonize the European Air Traffic Management (ATM) System and should reduce CO₂ emissions by 10% per flight by 2020. Air France and KLM provided a significant contribution by active participation, since 2005, in the definition of a new European ATM Infrastructure for 2020. Implementation of the ATM Target Concept will directly reduce the environmental impact of every flight in European airspace and at European airports. SESAR is expected to save around 79,000 and 158,000 tonnes of CO₂ by 2013 and 2020 respectively. A similar agreement is in process for North America. Air France KLM are also engaged in the AIRE (Atlantic Interoperability initiative to Reduce Emissions) initiative to optimize routes between the EU and the United States. However, working with a large number of partners, member states and the European Commission can be very challenging as it can lead to disagreements and sovereignty issues.

2. Engaging with a wide range Stakeholders

Air France KLM engage with a wide range of stakeholders to share best practices, knowledge and services. A brief summary of the main stakeholders, engagement pathways and achievement is given below.

Stakeholders	Engagement pathways	Achievements 2007-08
European, French and Dutch authorities	Initiatives directed at national and European authorities. Leading the Dutch Airline Industry Climate Change Working Group.	Air France endorsement of the air transport convention in the framework of the "Grenelle de l'Environnement".
Environmental NGOs	Strategic partnerships with NGOs based on transparency.	KLM partnership with WWF Netherlands. Environmental program (Madagascar) of GoodPlanet supported by Air France.
Customers	Surveys of passengers (special Flying Blue member survey) and corporate accounts.	Development of CO ₂ calculators. Compensation programs: KLM's "CO2ZERO" and Air France's Action Carbone by GoodPlanet.
Air transport industry	Negotiations with manufacturers on fuel efficiency performance of aircraft. Chairmanship of AEA's IEC (Infrastructure and Environment Committee) and of IATA's ENCOM (Environmental Committee).	Fuel efficiency performance criteria included in aircraft purchasing contracts. Contribution to European and International airlines policies.

3. Partnership with NGOs

Air France works with NGOs on immediate plans to fight climate change. It has committed to support a 5 million euro, 3-year program to avert deforestation in Madagascar together with Good Planet. Carried out locally by WWF Madagascar, it aims at slowing down the rate of loss of rain forests, with a potential carbon capture of 60-70 million tonnes.

4. Research on bio-fuels

Air-France is part of consortium in the study of mid-term opportunities for biofuels deployment. Onera, a French aviation research company, will lead a 19-organization consortium for a 26-month project funded by the European Commission. The Sustainable Way for Alternative Fuel and Energy in Aviation study will focus on the feasibility of multiple alternative fuel sources in Europe, Consortium members include Bauhaus Luftfahrt,

German Aerospace Centre (DLR), University of Sheffield, Airbus, Air France, EADS-IW, Embraer, Snecma, Rolls-Royce, IATA and Shell.

5. Procurement policy

The main aim of the company procurement policy is to support and promote the major principles of sustainable development: the defence of human rights, social progress and environmental protection. To this end a procurement sustainability charter was developed in 2004 by Air France, and subscribed to in 2006 by KLM. The charter intensifies supply chain risk management procedures while raising supplier awareness at the same time. New as well as existing suppliers are being asked to comply with the procurement sustainability charter. In addition to that, during tendering potential suppliers are requested to provide social, ethical and environmental information which will be used in the selection process. To verify that information quality audits have been undertaken. The result of 40 Air France supplier audits showed that 90% were aligned on the ambitions formulated in the charter, while 10% needed to take corrective CSR action.

6. Initiatives aimed at customers

- **Providing accurate information about emissions linked to flying with Air France and KLM** - In 2007-08, Air France and KLM provided customers and the general public with a CO₂ calculator on each of their websites to help passengers accurately calculate their CO₂ emissions when flying. Unlike most existing calculators, Air France-KLM's calculators use real operating data from individual routes averaged over 12 months, taking the type of aircraft operated on the route into account, actual fuel consumption, the number of passengers on board, and the weight of baggage and cargo. Air France and KLM's CO₂ calculators were calibrated by KPMG, an independent auditor, which stated that there was a "reasonable assurance" on the data calculated according to methods presented on the respective web sites. In France, the methodology used in the Air France calculator was also verified by ADEME, the French Environment and Energy Management Agency.
- **Compensating CO₂ emissions for carbon-neutral flight** - Since October 2007 Air France has offered customers a web based facility to offset their carbon emissions through a link to a joint Air France/Good Planet website. Two such projects are available: "green" coal production from agricultural waste near Saint-Louis (Senegal) and biogas distribution reservoirs in the Weining district of China. Since March 2008, KLM offers passengers via its booking tool the opportunity to compensate for their share of CO₂ emissions through Gold Standard projects in its voluntary CO2ZERO service. WWF Netherlands and KLM have signed an agreement to this effect. The Gold Standard ensures that compensatory funds are effectively invested in projects using renewable energy, notably in developing countries. By making this possible, KLM hopes to raise broader awareness among its customers of the indirect impacts of flying, as well as encouraging more customers to offset their emissions.

7. UN Global Compact principles

The Company signed the UN Global Compact in 2003 and a Diversity Charter in September 2006. This underlines the company's commitment to Corporate Social Responsibility by abiding by the Compact's drafting of codes of conduct and in-house Charters. The Global Compact is a charter drafted by the United Nations in 2000. "It seeks to promote responsible corporate citizenship so that business can be part of the solution to the challenges of globalisation"⁵¹. The Ten Principles of the Global Compact⁵² are derived from the principles of the United Nations:

⁵¹ <http://www.unglobalcompact.org/AboutTheGC/index.html>

⁵² <http://www.unglobalcompact.org/AboutTheGC/TheTenPrinciples/index.html>

- The Universal Declaration of Human Rights,
- The International Labour Organization's Declaration on Fundamental Principles and Rights at Work,
- The Rio Declaration on Environment and Development,
- The United Nations Convention against Corruption.

14.5 Impact on company performances

Sustained and planned investments to modernise and increase the efficiency of its fleets have also enabled the company to enhance its competitiveness primarily by controlling costs. Fleet modernisation generates fuel and maintenance cost savings. On average, jet fuel accounts for nearly 30% of total operating costs for the airline industry⁵³. Measures to increase efficiency of ground services and route optimization provides additional productivity benefits for the company.

Air France-KLM features in the main sustainable development indexes, namely the Dow Jones Sustainability Index (DJSI) World, DJSI STOXX, plus the FTSE4Good and Aspi Eurozone indexes. Air France KLM is the only air transport group to feature in the DJSI STOXX index since 2006. The company also has the best score of all the airlines listed in the DJSI World Index. The group has the best score on the environmental criterion and scores which are also close to the best in the economic and social categories.

In 2007, and for the second consecutive year, the group was included in the Fortune Global 100 (G100) ranking of the 100 most sustainable enterprises out of a total of 1,800 companies, ranked according to 32 criteria.

The Air France KLM Group Corporate Social Responsibility report simultaneously won two awards in France and the Netherlands respectively.

- On 27th January 2009, at a ceremony held at the French Ministry of Ecology, Energy, Sustainable Development and Spatial Planning, a representative of the French Order of Chartered Accountants presented Air France KLM with the award for "Best Corporate Social Responsibility Report 2008". The Air France KLM report won the judges' votes on the basis of the following criteria: "a wealth of facts and figures", "a presentation of comparison criteria" and "a genuine Corporate Social Responsibility programme in which stakeholder expectations are comprehensively taken into account".
- On 29th January 2008, Air France KLM was awarded the "Best Communication" prize by the Royal Netherlands Institute of Chartered Accountants, the French Order's equivalent in the Netherlands. The report won plaudits for being "a lucid and illustrative report with a logical structure. It shows clearly how CSR is embedded in the organization".

14.6 Impact on jobs and skills

14.6.1 Impact on jobs

Climate change policy has led to a change in the type, skills and quality of jobs for Air France and KLM in general. The company is major regional employer and supports significant number of direct and indirect jobs. Charles De Gaulle Roissy airport provides 280,000 direct or indirect jobs of which 64,000 are directly for Air France. Schiphol Airport in the Netherlands provides 120,000 direct and indirect jobs of which 30,000 are directly for KLM.

The direct and indirect jobs are dependent on customer numbers: 1 million new customers, on average, are responsible for around 4,000 direct and indirect jobs (1,100 direct jobs,

⁵³ IATA financial forecast, May 2008

1,100 indirect jobs by close providers and external services, 1,800 jobs by “catalytic” outlying activities).

The company believes that some of their main suppliers are already responding to their environmental standards. General Electric as engine providers and Airbus for the aircrafts and avionics have adapted to new standards. The company has to share the cost of developing new technologies and fuels with partners. All this investment will thus have an impact on jobs and training. According to Air France KLM, SMEs will also be concerned with climate change and aware of measures adopted by Air France KLM. However, it will not be possible for them to adapt to new standards without financial assistance from Air France KLM. The current economic crisis will make difficult to maintain a high level of support and training for non essential fields.

The investments described in section 1.4.1 would definitely create new jobs, especially for the maintenance and use of the new aircrafts like the Airbus A380.

However, the main impacts on jobs will be upskilling of existing employees. The case study interviews and Air France KLM CSR reports suggest that the company is actively engaged in restructuring its activities, and thus jobs, to comply with climate change policy drivers.

The company expects job losses if participation in the EU ETS distorts global competition. According to an E&Y study, a European carrier like Air France could lose up to 11% of traffic on long haul networks⁵⁴.

14.6.2 Impact on skills

Air France invested €271 million for training in 2007 (10.8% of the total gross wages instead of 1.6% legally required). This represents 3,070,000 hours of training for ground staff, cabin crew and pilots. Around 50% of these training hours are spent on technical and regulation.

- Ground staff - New aircrafts involve new skills and new technologies. So training will be reinforced for ground staff for servicing and maintenance. Staff who have worked on old aircrafts have to be trained on new technologies such as refuelling and changes to accommodate new aircraft like the A380 with a double-deck that needs a special terminal. Training costs for ground staff represents 6.7% of the ground staff's gross wages;
- Cabin crew – training for in-plane equipment, mobility and safety. Training costs represents 10.8 % of the cabin air crews' gross wages;
- Air crew - Training for pilots is a key process both for optimizing routes to reduce CO₂ and basic flying training to use less fuels. Training for pilots is very expensive: training costs are around 20% of the pilots' gross wages. Staff who have worked on old aircrafts have to be trained on new technologies, cabin equipments, management of passengers etc.

Air France KLM are also fostering training in the new French legal framework 'Droit Individuel à la formation (DIF) – individual training rights' that doubled in 2007, from 3.2% to 6.5% (66,970 hours for ground staff).

The current economic crisis would impose financial constraints to meet new challenges without increasing costs. So the necessary skills for climate change measures will involve modifying their training scheme instead of introducing new schemes.

Sustainable development guidelines are already included for training on new technologies and can be further strengthened due to: new standards, new equipment (avionics, mechanics, electric vehicles in the airport areas, pollution checking, premises in

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http://www.europarl.europa.eu/meetdocs/2004_2009/documents/dv/tran20070627_summeandy_pres_/tran20070627_summeandy_pres_en.pdf

accordance with new norms, etc.), new behaviour regarding public and individual transport, commuting and new procedures to use low CO₂ emission aircrafts (e.g. A380).

14.7 Future implications of climate change policy drivers

14.7.1 Implications of new climate change policy drivers - air transport joining the EU ETS in 2012

The Air France-KLM group actively supports the principle of emissions trading schemes, supplementing its initiatives to minimize its own emissions. The EU ETS will provide a continuous incentive to reduce emissions. However, the situation of fluctuating oil prices and the global economic slowdown, they claim, requires a cautious approach. The inclusion of aviation in the EU ETS in its proposed form⁵⁵ could undermine the competitiveness of the European airline industry and hence its global leadership in the fight against climate change.

Air France KLM is currently working with the International Civil Aviation Organization (ICAO) on improving procedures, emissions permit trading and emissions standards.

An independent impact assessment on the inclusion of aviation into the EU Emissions Trading Scheme (ETS)⁵⁶, conducted on behalf of the European aviation industry concludes that the European Commission's proposal in its present form will jeopardise the long-term viability of the European aviation industry. The key findings of the report are:

- Barely one third of the cost of the Commission's proposed scheme will be recoverable from passengers and shippers, as the ability of airlines to pass costs onto their customers will vary according to the operator's business model and its exposure to competition. This is in direct contradiction to the Commission's claims that the cost of its ETS proposal can be passed on to customers, largely or even in full.
- The proposed closed nature of the scheme (excludes non-EU airlines) would create an un-level playing field. Demand for air travel is highly price-sensitive, therefore, any price increase will result in a loss of passengers and freight for European airlines. This could also lead to carbon leakage.
- The cost for the European Airlines for two different scenarios with two different carbon prices is shown below.

Period 2012-2020	Scenario 1, 30 Euros/t CO ₂ , 15% auctioning 2012- 2020	Scenario 2, 50 Euros/t CO ₂ , 15% auctioning 2012- 2020
Cost- Purchasing	31,4 Bill. Euros	51 Bill. Euros
Cost- Auctioning	8,4 Bill. Euros	14 Bill. Euros
Total costs	39,8 Bill. Euros	65 Bill. Euros

- Aircraft operators' overall profits will be reduced by over €40 billion during the same period, weakening the financial stability of a number of operators⁵⁷.

⁵⁵ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008L0101:EN:NOT>

⁵⁶ http://www.europarl.europa.eu/hearings/20070627/tran/ambrose_summary_en.pdf

⁵⁷ Based on a 'without auctioning' scenario, assuming an allowance cost of €30.

- The complexity and costs of administrating the scheme will be a challenge, particularly if the scheme is applied to small operators, such as business aviation and helicopters, which contribute less than one percent of aviation emissions.
- The impact of ETS on EU aviation will reflect on the European economy as a whole. Decreases in both connectivity and tourism will penalise regions and peripheral communities. It is also likely that intercontinental traffic flows would be diverted from European to non-European hubs, thus making Europe a less attractive place to invest and to do business.

14.8 Lessons

Air France KLM sees the following as lessons that may be applicable to other companies and sectors:

- To identify 'win-win' situations, for example increasing the fuel efficiency of the fleet can improve its competitiveness by controlling costs.
- Recognising that no measure is small and focussing efforts to reduce emission in all activities of the business from in-flight, route management, ground activities, offsetting and procurement.
- The company recognises the importance of its workforce and invests substantially to maintain or improve their productivity.
- Transparency and comprehensive CO₂ reporting can pay rich dividends in terms of consumer and investor confidence.
- For positive results, it is important to communicate the risks of climate change and benefits of taking action both internally within the company and externally to customers and other stakeholders.

15 CASE STUDY 13: VIRGIN-ATLANTIC

15.1 Summary

Virgin Atlantic Airways is currently Britain's second largest carrier serving the world's major cities. The company is aware of increasing emissions from air transport and recognises the seriousness of climate change impacts on the planet. Climate change policy drivers have led to a number of changes in the way the company conducts its business. The company has taken a number of steps to embed sustainability in its core business activities. More than 99% of the company's carbon emissions arises from jet fuel. Hence, the company has initiated a number of measures to reduce fuel consumption:

- The company has embarked on an ambitious fleet renewal programme. Virgin Atlantic has ordered 15 of the 787-9 Dreamliners - with options on ordering another eight 787-9s and purchase rights on a further 20 aircraft. The 787-9 Dreamliner burns around 27% less fuel per passenger than the A340-300, the aircraft it will replace in the Virgin Atlantic fleet.
- It is supporting and investing in the development of second generation biofuels for aircrafts. On 24 February 2008, Virgin Atlantic became the first airline in the world to operate a commercial aircraft on a biofuel blend. The Boeing 747 flew a short flight from London to Amsterdam, using a 20% biofuel and 80% kerosene blend in one of its four engines.
- It has taken a number of steps to remove any extraneous weight from their aircrafts. Finding lighter-weight alternatives to existing materials can provide significant emission reductions.
- The company also pioneered the use of 'starting grids' enabling aircraft to reduce their fuel burn and carbon emissions by up to 50% on the ground, and reduce noise emissions for local communities.
- It has also reduced emissions on the ground by using fixed electrical ground power rather than relying on running the aircraft's auxiliary power units and burning substantial quantities of fuel in order to run the air conditioning and onboard electrical systems whilst on the ground. At all of the main UK sites Virgin currently buy electricity from renewable sources.
- The company is also part of a number of coalition groups, such as the Sustainable Aviation Strategy, Aviation Global Deal and the Association of EU Airlines (AEA) to share best practices, promote new technologies and ensure a coordinated approach for reducing carbon emissions. Virgin Atlantic is also campaigning for a Single European Sky⁵⁸ and other air traffic control efficiency gains.

Virgin Atlantic supports the inclusion of aviation in the EU ETS from 2013. The company believes emission trading if designed properly can achieve cost effective carbon emission reductions and encourage the airline industry to become more efficient and invest in newer and cleaner technologies.

15.2 Introduction

Founded in 1984, Virgin Atlantic Airways has become Britain's second largest carrier serving the world's major cities. Based at London's Gatwick and Heathrow airports and Manchester airport, it operates long haul services to thirty destinations world-wide as far apart as Las Vegas and Shanghai.

⁵⁸ http://www.eurocontrol.int/ses/public/standard_page/sk_ses.html

Virgin Atlantic is 51% owned by the Virgin Group and 49% owned by Singapore Airlines. On 20 December 1999 Richard Branson signed an agreement to sell a 49% stake of Virgin Atlantic to Singapore Airlines to form a global partnership.

Virgin Atlantic currently has a fleet of 38 aircrafts, which includes thirteen Boeing 747s and six Airbus 340-300s and nineteen Airbus A340-600s.

The company had a turnover of £2.3 billion in 2008 with profits to the tune of £61 million. Virgin Atlantic has won business, consumer and trade awards from around the world. Virgin Atlantic has carried around 58 million passengers since it began operations and now employs over 9,000 people worldwide.

15.3 Key climate change policy drivers for change so far

15.3.1 Company initiative

The company recognises the growing impact air travel has on the environment, and is seeking to address this in a number of ways. There are many projects in place across the business to make this a reality, both in the air and on the ground. The company has a sustainable aviation strategy and is investing substantially to reduce fuel consumption and its carbon footprint.

15.3.2 Market drivers

The airline is a customer focussed company and believes in providing a safe and sustainable service. The company is also aware that the customer is increasingly becoming more environment conscious and that there is a need to take imaginative steps to tackle climate change.

15.3.3 Regulatory drivers

The airline is subject to the climate change levy (CCL) for its ground activities. It is also part of the UK Carbon Reduction Commitment and has set itself targets to increase energy efficiency from both ground and air activities. The company is committed to increase the share of renewable energy from its ground activities and to renewing its fleet by purchasing more fuel efficient aircrafts.

Virgin Atlantic supports the inclusion of the aviation industry within the EU's Emissions Trading Scheme from 2013. This will fundamentally affect the activities of the company requiring a coordinated and strategic approach.

15.4 What has the company been doing so far?

More than 99% of Virgin Atlantic's carbon dioxide emissions come from its aircraft operations. In 2006-2007, the company was responsible for nearly 5 million tonnes of carbon dioxide from aircraft operations. This figure was audited and verified by independent emissions verification specialists CICS⁵⁹ in 2007. The remainder of the company's carbon footprint is from ground activities such as office facilities, business travel, and staff travel to and from work. This has been calculated (through a project with the Carbon Trust to be 26,600 tonnes of CO₂ for 2006-2007).

Virgin has set itself a challenging target of improving fuel efficiency (fuel consumption per passenger litres per 100 km) by 30% between 2007 and 2020. This will largely be met through investment in new, fuel efficient aircraft such as the Boeing 787 Dreamliner, but also through operational efficiencies, improved air traffic management and reducing weight from onboard the aircraft.

The company's energy modelling shows that absolute emissions should peak within the next decade and tail off, despite continuous business growth. This means that Virgin would have decoupled growth as an airline from automatic growth in emissions.

⁵⁹ <http://www.cicsltd.com/cfv.html>

The company is working with internal and external stakeholders to identify and implement a number of fuel saving opportunities. It has developed a 29 point action Plan to reduce its environmental impact from all activities of the business⁶⁰.

15.4.1 Internal actions and measures

1) Fleet renewal

In terms of its aircraft fleet, Virgin is already starting from a high baseline operating a relatively young and fuel efficient fleet. The average age of Virgin Atlantic's fleet of aircraft age is 5 years and 11 months⁶¹.

Virgin Atlantic is ordering 15 of the 787-9 Dreamliners - with options on ordering another eight 787-9s and purchase rights on a further 20 aircrafts. The 787-9 Dreamliner burns around 27% less fuel per passenger than the A340-300, the aircraft it will replace in the Virgin Atlantic fleet. The order will see Virgin Atlantic take delivery of its new planes from 2011 worth up to US\$8 billion.

The Boeing 787-9, which can carry up to 290 passengers depending on the bed or seat layout, brings a step change in aviation and will substantially reduce the industry's impact on the environment. Its innovative design, with over half of the aircraft built from composite materials, helps to reduce fuel burn and carbon emissions significantly.

2) Biofuels

On 24 February 2008, Virgin Atlantic became the first airline in the world to operate a commercial aircraft on a biofuel blend. The Boeing 747 flew a short flight from London to Amsterdam, using a 20% biofuel and 80% kerosene blend in one of its four engines.

The Virgin boss, Richard Branson, also committed all profits from his travel firms, Virgin Atlantic and Virgin Trains, over the next 10 years to fight global warming. This investment would be around \$3 billion over the next 10 years. The funds will be invested in schemes to develop new renewable energy technologies, through an investment unit called Virgin Fuels. The Virgin Fuels business will invest up to \$400m in green energy projects. It has already announced its backing for a California firm, Cilion which plans to make bio ethanol from corn.

3) Weight reduction measures

The airline has taken a number of steps to remove any extraneous weight from their aircrafts. Weight (and the fuel needed to fly it around) is now a key consideration in developing new onboard products and services, and finding lighter-weight alternatives to existing materials can add up to considerable emissions reductions over the course of a year. The company has a group of experts who meet monthly to identify where they can make weight savings across the business. They have a target to remove one tonne per aircraft in 2007/2008, and this will be achieved by removing unnecessary items, using lighter-weight alternatives and new materials for onboard products. Each tonne of weight removed from just one aircraft saves over 420 tonnes of carbon dioxide emissions per year.

4) Ground activities

'Starting grids' before take-off

Boeing and Virgin Atlantic are also working in partnership to cut aircraft emissions on the ground, as well as in the air. Boeing supports the trials of towing Virgin Atlantic planes to so-called 'starting-grids'. A "starting grid" is a holding area, close to a runway, consisting of several parking bays for aircraft. It means that aircraft can be towed closer to a runway before take-off, substantially reducing the time that engines need to be running. An aircraft

⁶⁰ <http://www.virgin-atlantic.com/en/gb/allaboutus/environment/manifesto1to15.jsp>

⁶¹ http://www.virgin-atlantic.com/tridion/images/didknownov_tcm4-426056.pdf

would only need to start its engines once on the grid, around 10 minutes before actual take-off. Thus, enabling aircraft to reduce their fuel burn and carbon emissions by up to 50% on the ground, and reduce noise emissions for local communities. The trials, at London's Heathrow and Gatwick Airports, as well as San Francisco, have produced significant positive results which will be used to find alternatives to traditional taxi-ing procedures at the world's busiest airports. Boeing's involvement in reviewing aircraft technical requirements for towing will enable other airline customers to develop procedures for reducing fuel burn and emissions on the ground.

Fixed electrical ground power

The company is also working with stakeholders to improve the availability and reliability of "fixed electrical ground power" (electricity supplied to the aircraft at the gate from a central airport system) rather than relying on running the aircraft's auxiliary power units and burning substantial quantities of fuel in order to run the air conditioning and onboard electrical systems whilst on the ground. Together with technical solutions such as new engine washing systems, these will contribute to carbon emissions reductions of tens of thousands of tonnes in 2009 year alone.

Renewable energy and energy efficiency

At all of the main UK sites Virgin currently buy electricity from renewable sources, but are committed to reduce their usage through:

- Staff education on energy saving initiatives;
- Investing in cost effective energy saving devices and appliances;
- Identifying opportunities for efficiency gains in key areas such as heating, cooling, lighting and engineering processes.

By 2020, Virgin intends to generate all the electricity required for the main UK sites internally. The company has a target to reduce energy consumption by 10% by 2012 and 20% by 2020 at all Virgin Atlantic-controlled sites around the world.

5) Internal communication

Virgin Airlines has an environmental policy, which includes targets in key areas such as energy, waste, water, business travel and natural resources. The environmental policy applies to all of the company's managed facilities and operations around the world. This policy is on their website and has been circulated to suppliers, customers and other interested parties. Initiatives aimed at reducing environmental impacts in these key areas and progress against the targets is reported regularly on its website.

6) Carbon offsetting

Virgin has a Gold Standard Scheme in partnership with 'myclimate' - a Swiss based charity who fund clean energy solutions, especially in developing countries. The charity is endorsed by 47 NGOs worldwide including many environmental groups. Gold Standard methodology was created to encourage a shift from a fossil fuel based economy to a renewable energy economy. This means the money goes directly to a project which has immediate positive impact on the environment and the local community.

15.4.2 External actions and measures

An airline company does not work in isolation. Further carbon emission reduction requires collaborative effort with airport authorities, manufacturers and air traffic controllers. Initiatives such as "Idle Power Descents" and reviewing air traffic control routings require the cooperation of many different companies and organisations. This will allow airlines to operate their aircraft even more efficiently in the future.

1) Air traffic management

Virgin Atlantic is also campaigning for a Single European Sky⁶² and other air traffic control efficiency gains. More direct routings provide significant fuel savings. The potential efficiency gains achievable through the Single European Sky initiative, which could result in a 12% fuel efficiency improvement for the industry. But this also lies in the domain of national governments which requires them to play an active part.

2) Sustainable Aviation Fuel Users Group (SAFUG)

Virgin, Boeing, the petroleum refining technology developer UOP, and airlines such as, Air France, Gulf Air and Japan Airlines formed the Sustainable Aviation Fuel Users Group⁶³. The group's members represent about 15% of the world's aviation fuel consumption. "SAFUG is focused on establishing the sustainability criteria, such as life-cycle assessments, and have developed a fact base to avoid the kinds of problems that have crept into early biofuels development. The group represents the first global transportation sector to voluntarily push for sustainability practices in its fuel supply chain. The group is initiating peer-reviewed research into a biodiesel fuel derived from *jatropha curcas* – a plant grown in many tropical and subtropical areas that does not compete with food crops – which will include assessment of lifecycle CO₂ emissions and potential socio-economic effects on producer countries.

3) Aviation Global Deal

Virgin is also part of the industry coalition, the Aviation Global Deal (AGD) Group, which brings together Air France/KLM, British Airways, Cathay Pacific and airport operator BAA. The Group in February 2009 called for CO₂ emissions from international aviation to be included in a new global climate deal. The agreement will be negotiated by world leaders at the United Nations climate summit in Copenhagen in December 2009. Emissions from international aviation, which currently contribute around 2 per cent of global CO₂ emissions (source: IPCC), were not included in the Kyoto Protocol commitments and are not currently managed under an international climate change treaty. The Group published a communiqué calling for a pragmatic, fair and effective global policy solution for the sector, as a contribution to the UN International Civil Aviation Organisation's (ICAO) preparations for climate change negotiations in Copenhagen⁶⁴.

4) Technology and knowledge transfer

Virgin is also a collaborative partner with Omega⁶⁵, a publicly funded partnership that offers impartial, innovative and topical insights into the environmental effects of the air transport industry and sustainability solutions. Omega provides knowledge and tools and acts as a forum for debate and as a catalyst for action by the sector and policy makers - to address climate change and other relevant sustainability issues. This landmark partnership brings together world-class experts from nine UK universities⁶⁶ to develop a comprehensive 'one stop shop' of the latest information on the impact of aviation on the environment. The Omega partnership draws upon the very best skills and expertise in the field; the multidisciplinary team includes experts in environmental and social sciences, technology, business, economics, environment, politics and global regulation.

⁶² http://www.eurocontrol.int/ses/public/standard_page/sk_ses.html

⁶³ http://www.boeing.com/commercial/environment/pdf/sustainable_aviation_fuel_users_group.pdf

⁶⁴ http://www.theclimategroup.org/assets/resources/120209_AGD_Principles_Communique_FINAL1.pdf

⁶⁵ <http://www.omega.mmu.ac.uk/climate-change.htm>

⁶⁶ Omega is led by Manchester Metropolitan University with Cambridge and Cranfield: other partners are Leeds, Loughborough, Oxford, Reading, Sheffield and Southampton.

15.5 Impact on company performance

The company has achieved a sustained level of growth in passenger numbers in the last five years. The company's profits have increased by 3 times from £21 million in 2004 to £61 million in 2008⁶⁷. Though it is not possible to quantify the profits and the cost savings that are uniquely associated with sustainable measures.

Virgin Atlantic's commitment for reducing environmental impacts is enabling them to become a more efficient business, leading the industry to practical and technical solutions. As well as engaging, inspiring and empowering their staff and customers to help them meet this challenge.

15.6 Impact on jobs and skills

The company is increasingly embedding sustainability and energy efficiency into all aspects of the business. It has been difficult to point out specific jobs created mainly by climate change policy drivers. However, most job profiles and roles have changed to embed sustainability into all activities. For example, the core part of the role of the facilities management department now involves energy and waste efficiency. Technical personnel and engineers have also risen to the challenge to implement weight and fuel saving measures. Sustainability and energy saving skills and training are now built into all in-house technical courses. Thus, role specific training is part of day to day activities.

The company can achieve significant emissions reductions through pilot training, switching off aircraft engines whilst waiting in queues to take off and tailoring maintenance procedures to ensure optimum fuel efficiency.

The company has an internal Fuel Panel which has a target of saving 7,000 tonnes of fuel (that's more than 21,000 tonnes of CO₂) in 2007/2008. The Fuel Panel meets monthly, is made up of pilots, engineers and other technical experts from the Flight Operations team. They will achieve their goal through initiatives such as engine compressor washing (which allows the aircraft engines to operate more efficiently), and educating pilots on more fuel efficient procedures for takeoff and landing.

For all UK staff with a key responsibility for procurement, the company provides in depth training on sustainable procurement practices and have included sustainability criteria into their internal briefing and prioritisation documents and tools.

The company considers complying with climate change policy drivers as business as usual rather than an add-on requirement.

15.7 Future implications of climate policy drivers

15.7.1 *Implications of new climate change policy drivers - aviation part of EU ETS from 2013.*

Virgin Atlantic supports the overall objectives of ETS. These are to use a market-based mechanism to achieve cost effective carbon emission reductions and encourage businesses to invest in newer, cleaner technologies. The company will continue to push for an international emission trading scheme, based on the EU ETS model proposed by the Commission with a robust cap on emissions; prepare the airline for participation in emissions trading; and build the external cost of carbon into future business decisions.

As part of the company's preparations for emissions trading it has carried out a carbon baseline verification pilot with independent specialists CICS⁶⁸ to ensure the potential price of carbon emissions under ETS is taken into account in all future business decisions.

⁶⁷ http://www.virgin-atlantic.com/tridion/images/companyoverviewnov_tcm4-426059.pdf

⁶⁸ <http://www.cicsltd.com/>

Virgin-Atlantic is a member of the Association of EU Airlines (AEA) which has called for the Council, the European Parliament, the Commission and National Authorities to take into consideration the high abatement costs and international competition when designing the scheme⁶⁹. In its current form, it could lead to business and carbon leakage. A study by E&Y⁷⁰ found that network airlines, for the period 2012 to 2020, would experience a decline globally from the assumed operating margin of 4% to between 2.4% and -1.2%. In the short/medium term, there would be a reduction in capacity. In the longer term, it is also likely to affect EU operators' ability to invest in new technologies and fleet renewal. Furthermore, as EU-based airlines will be more affected than non-EU based carriers this would result in competitive imbalances.

The AEA thus calls for the need for a shared and collective effort. In addition to the EU ETS, EU Authorities should also recognise the potential from a better Air Traffic Management System, tackling airport congestion so as to massively reduce unnecessary fuel burn and hence emissions, and investing in Research and Development, so as to fund and promote technological progress.

15.8 Lessons

Virgin Atlantic sees the following as lessons that may be applicable to other companies and sectors:

- Airlines only fly the planes and thus it is important to work with a wide range of stakeholders to make the aviation industry more sustainable in the future. Companies should complement internal measures with external initiatives to develop practical solutions and share best practices.
- Companies have to be imaginative with their solutions, for example Virgin initiated 'starting grids' and use of biofuels for reducing carbon emissions.
- Internal and external communication is vital to integrate sustainability in core business activities. Virgin has a strong CSR agenda for external communication. Internally, it provides employees with information about how they can actively reduce their own footprint both at home and in the office.
- Companies should have a clear understanding of their CO₂ footprint and then develop appropriate action plans.

⁶⁹ http://www.aea.be/assets/documents/positions/PP_ETTS_17October07.pdf

⁷⁰ http://files.aea.be/Downloads/EY_FULL_TEXT_OCT08.pdf

16 CASE STUDY 14: DEUTSCH POST DHL GROUP

16.1 Summary

Deutsche Post DHL is now the largest transport and logistics company in the world with annual revenues of more than €54 billion and over 500,000 employees in more than 220 countries and territories.

In April 2008, the company launched its *GOGREEN* climate protection programme, becoming one of the first in its sector to set a quantifiable carbon emissions reduction target. The company seeks to cut emissions across both its own operation and those of its subcontractors by 30% by 2020 compared to 2007 levels. As an intermediate step to achieving this ambitious target, the Group aims to improve carbon efficiency of its own operations by 10% by 2012.

Having spent a considerable amount of time building up a detailed picture of carbon emissions across the Group, Deutsche Post DHL is now deploying a wide range of measures to help it achieve its ambitious carbon reduction aims. These include: optimizing its air and vehicle fleets; increasing energy efficiency across its estate; developing innovative technologies; motivating employees to be more environmentally aware; improving driver training and loading techniques for vehicles and aircraft to minimise emissions; and, integrating customers and sub-contractors into its programmes.

In March 2009, the Group's CEO, Frank Appel, reaffirmed that the *GOGREEN* programme is a significant component of the company's 'Strategy 2015', which aims to make the company fitter for the future in order to unlock the company's potential to increase organic growth. Strategy 2015 also seeks to maintain the Group's strong position in the German mail market whilst raising profitability at DHL.

Deutsche Post DHL has yet to calculate the overall impact of its measures on jobs, either directly or indirectly through secondary or tertiary impacts of climate change policy drivers. However, *GOGREEN* will help improve the company's cost position and competitiveness and thus help secure and possibly create jobs as the business becomes successful. For example, the company recently heard that they were awarded a major contract, beating a leading competitor, explicitly because of their overall approach to the environment. This is seen as a very strong confirmation of the company's Sustainability Strategy and a clear message that excellent sustainability performance helps improve competitiveness and success in the marketplace.

Perhaps the main finding from Deutsche Post DHL's efforts in reducing emissions has been that overall, it is hard to create jobs in a very low margin business sector like logistics. However, failure to reduce carbon emissions in this sector will generally lead to firms being worse off financially and less able to weather market downturns.

For other large companies considering ramping up their efforts to reduce carbon emissions, Deutsche Post DHL's experiences also show that putting in place the right framework for action together with a management structure that includes the Group CEO helps to fully integrate the new policies into standard business practice, thus making them accepted and valued by employees.

Finally, staff need sufficient levels of training to be able to maximise the efficiency savings from new technologies, especially for vehicles. A raft of measures including e-learning tools; a dedicated intranet on the *GOGREEN* programme and subject experts within the Group who may be consulted by staff have all been used to raise skills levels and awareness across the company's massive workforce.

16.2 Introduction

Following an expansion phase over recent years, Deutsche Post DHL is now the largest transport and logistics company in the world with annual revenues of more than €54 billion and over 500,000 employees in more than 220 countries and territories.

In March 2009, the Group's CEO, Frank Appel, announced the launch of 'Strategy 2015', which aims to make the company fitter for the future in order to unlock the company's potential to increase organic growth.

Strategy 2015 also seeks to maintain the Group's strong position in the German mail market whilst raising profitability at DHL. As part of realising this Strategy, the Group is now embarking on its IndEx programme which aims to generate savings of at least €1 billion in non-operating costs by the end of 2010.

The *GOGREEN* programme is also regarded as a vital element in maintaining the Group's overall market positioning and competitive edge. *GOGREEN* combines custom-designed strategy solutions, operational optimization and new technology incubation within the Deutsche Post DHL Group to achieve its ambitious 30% emissions reduction target.

16.3 Key climate change policy drivers for change so far

Company initiative

Since transport contributes around 14% of global greenhouse gas emissions⁷¹ – and logistics makes up an important subset of that total – climate change has been the top environmental priority for Deutsche Post DHL since 2003. Well before the publication of the Stern Review in October 2006 made clear the need to act to reduce carbon emissions from the transport sector, Deutsche Post DHL had conducted strategic analysis which showed a very strong dependence between the Group and fossil fuels. This analysis also showed that the company was continuing its practices without either investigating or investing in alternative technologies. This created a corporate risk that would only increase with time. It therefore sought to rectify that shortcoming.

Carbon pricing regulations

Carbon pricing has also rapidly risen up the corporate agenda, becoming a key driver for the Group. For example, with the EU ETS now confirmed for aviation, the Eurovignette⁷² in place for taxation of heavy goods vehicles according to EURO emissions standards, and carbon emissions now on the agenda of the International Maritime Organisation (IMO), Deutsche Post DHL is firmly of the belief that sooner or later any mode of transport will be covered in a carbon pricing regime. It therefore takes the precautionary approach and believes it should continue to make every effort across its overall operation to reduce its carbon footprint and improve carbon efficiency to mitigate impacts.

Consumer pressures

A further significant driver for action which has been steadily growing over recent years has been the level of customer pressure and enquiry, particularly regarding the approaches that Deutsche Post DHL is taking to reduce their environmental impacts. This has been most evident in the award of contracts where such issues are now starting to make a tangible difference to eventual outcomes. For example, the company recently heard from a client that they were awarded a major contract, beating a leading competitor, explicitly because of their overall approach to the environment and sustainability in general.

⁷¹ Stern Review: Annex 7.c Emissions from the Transport Sector

⁷² The Eurovignette Directive covers the taxation of heavy goods vehicles in the EU. Eurovignette 2 rules have been confirmed and are pending on Eurovignette 3. Member States may differentiate tolls according to a vehicle's emission category ("EURO" classification) and the level of damage it causes to roads, the place, the time and the amount of congestion. This makes it possible to tackle the problems of traffic congestion, including damage to the environment, on the basis of the "user pays" and "polluter pays" principles. From 2012 onwards Directive [2006/38/EC](#) will apply to vehicles weighing between 3.5 and 12 tonnes.

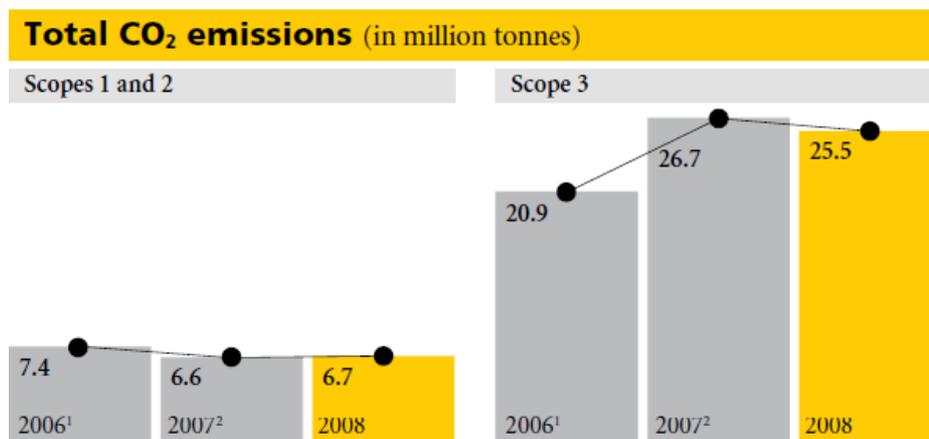
Overall, the proactive stance to climate change started by the company in 2003 is now starting to pay dividends. As Dr Winfried Häser, VP of Environmental Strategy and Policy for Deutsche Post DHL notes, “If Deutsche Post DHL had only started to act on climate change when the Stern Review came out, we would not be where we are now.”

16.4 What has the company been doing so far?

Emissions measurement and benchmarking

Deutsche Post DHL has undertaken a variety of initiatives to establish and report on its carbon emissions footprint. The company follows internationally recognised corporate accounting practices⁷³ to report CO₂ emissions. By increasing the use of measured data, improvements have been made to the data quality from 2007 to 2008. This has enabled refined calculations and more specific benchmarks to be established. It has also been possible to apply these improvements retrospectively to 2007 data, resulting in a restatement of the data reported in the company’s 2008 Sustainability Report.

In 2008, the carbon emissions directly controlled by Deutsche Post DHL were 6.7 million tonnes (Scope 1 & 2), whilst those resulting from services provided by Deutsche Post DHL subcontractors (Scope 3) were 25.5 million tonnes (see below⁷⁴).



Due to the business structure of Deutsche Post DHL, the carbon emissions of each corporate division must be measured in different ways, as follows:

- emissions of the MAIL division are measured by consignment;
- emissions for the Global Forwarding, Freight and EXPRESS divisions will be measured per tonne-kilometre;
- emissions for the Exel Supply Chain will be measured per square metre in buildings and plants.

The LOGISTICS division dominates the Group carbon footprint, representing around 70% of emissions, with EXPRESS contributing around 25%.

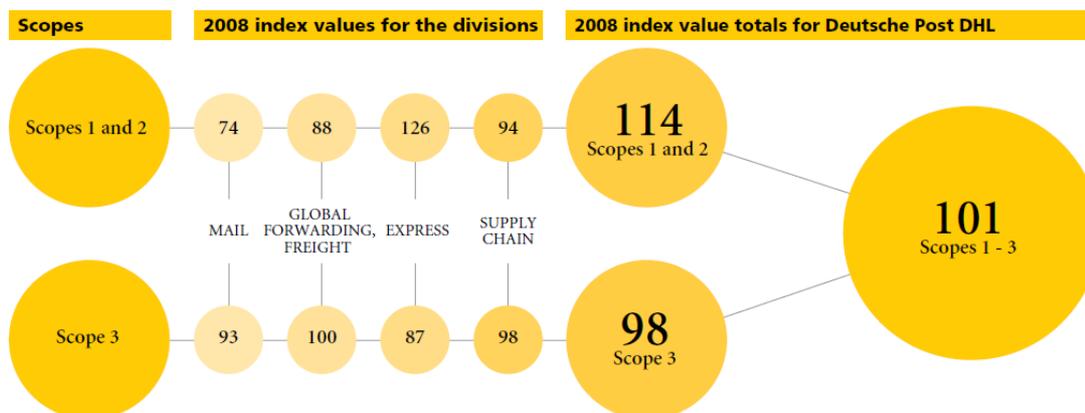
Deutsche Post DHL has established a Carbon Management unit which is currently setting up a Carbon Accounting system to measure and document carbon emissions across all of its corporate divisions. A “carbon efficiency index” is used to present the improvements in carbon emissions and efficiency at Group level. Each business division has an individual carbon efficiency ratio - weighted according to its absolute CO₂ emissions - which are then aggregated to form a group index (see Figure 14.1). For the base year 2007 this index

⁷³ The World Business Council for Sustainable Development (WBCSD) and World Resources Institute (WRI) Greenhouse Gas Protocol Corporate Standard (Corporate Accounting and Reporting Standard, revised March 2004) defines CO₂ emissions directly and indirectly resulting from own operations as “Scopes 1 and 2”, and CO₂ emissions from subcontractors as “Scope 3”.

⁷⁴ From 2009 sustainability report; see p.20 http://www.dp-dhl.com/SR2009/servicepages/downloads/files/entire_dp_csr09.pdf

number will be set to 100%. This index structure allows the company to define business specific carbon efficiency ratios which are then used as a management tool.

Figure 14.1: Carbon efficiency index for the Deutsche Post DHL Group⁷⁵



The Carbon Management unit will also provide precise assessments using a consistent method of the total carbon emissions arising from the *GOGREEN* products and services programme used by its customers. Emissions will be broken down according to distance, type of vehicle and fuel consumption. The corresponding emission value will be booked as debit on the carbon account. The system will be verified regularly by the independent Swiss certification body Société Générale de Surveillance SA (SGS).

16.4.1 Internal actions and measures

Strategic vision

GOGREEN, the company's climate protection programme, is one of three pillars of the firm's Corporate Social Responsibility approach.⁷⁶ Officially launched in April 2008 after 18 months of strategic work which looked at the scope of carbon emissions, possible carbon abatement 'levers' and possible/probable changes in policy at all levels, *GOGREEN* is the strategic sustainability cornerstone for the Group. It currently has actions extending to 2020 which comprise of the following key levers:

- optimization of the air and ground fleets;
- improved energy efficiency;
- the development of innovative technologies;
- employee motivation; and,
- the involvement of subcontractors.

Importantly, the CEO of Deutsche Post DHL, Frank Appel, is chair of *GOGREEN*'s Internal Steering Committee which assures high level buy-in from senior management.

⁷⁵ From 2009 sustainability report; see p. 21 http://www.dp-dhl.com/SR2009/servicepages/downloads/files/entire_dp_csr09.pdf

⁷⁶ The other two pillars are *DHL's Disaster Response Teams* (a partnership with the United Nations) and education and training programmes such as *Teach First* (which addresses education in socially disadvantaged communities by attracting high performing graduates to spend 1-2 years teaching before entering Deutsche Post DHL, thus improving the management skills and overall outlook of graduates.)



There are six strategic pillars to *GOGREEN*:

8. Transparency – the company is working hard to increase the quality and coverage of emissions as well as improving processes to capture carbon;
9. Driving efficiency – the most important pillar, both technology and process driven, covering all modes of transportation;
10. Engaging employees;
11. Creating value through *GOGREEN* climate-friendly services;
12. Policy & Regulation – working with policy makers;
13. Dedicated team – employed to drive emissions reductions across the Group.

The company seeks to cut emissions across both its own operation and those of its subcontractors by 30% by 2020 compared to 2007 levels. As a first step to achieving this ambitious target, the Group aims to improve carbon efficiency of its own operations by 10% by 2012 (see Table 14.1). *GOGREEN* also integrates a pre-existing climate protection goal which aimed to lower the carbon emissions of the European ground fleet by 5% compared to 1990 levels.

Table 14.1: Summary of carbon reduction targets in Deutsche Post DHL

Carbon emissions directly controlled by Deutsche Post DHL	Emissions from transport of goods	Scope 1	10% improvement in carbon efficiency by 2012	30% improvement in carbon efficiency by 2020
	Fuel consumption	Scope 2		
Services provided by Deutsche Post DHL subcontractors	Discussions with subcontractors have now started	Scope 3		

Carbon reduction technology assessment research

In order to assess both the ecological-efficiency and cost-efficiency of new technologies investments available to logistics companies to reduce greenhouse gases, the Group has funded alongside the German Ministry for Education and Research a research project called StaMoLo⁷⁷.

Over a two-year period, DHL Parcel Germany worked with researchers from the Öko-Institut e.V. and the Technical University of Dortmund to evaluate various cleaner technologies (e.g. energy efficiency lighting, renewable electricity production, novel heating systems, advanced logistics software packages etc.).

A decision support matrix was designed especially for logistics companies, taking account of factors include such as additional costs, savings and emission abatement potential. The project looked at two key operational areas:

⁷⁷ Measures for the reduction of greenhouse gas emissions of stationary and mobile processes in logistics companies

- Stationary processes – focused on parcel centres and depots/delivery bases; and,
- Mobile processes - focused on optimizing transport processes.

Examples of the measures undertaken in the StaMoLo project included:

- Replacing all fluorescent light bulbs at Krefeld parcel centre with more energy efficient and longer-lasting bulbs. This measure alone reduced the centre's annual power consumption for lighting by over 20%, producing a 2.5 year payback and saving around 110 tonnes of greenhouse emissions. The new bulbs have light levels which deteriorate less over time and ensure drastically reduced maintenance costs. The excellent results led to a recommendation that the 32 remaining DHL parcel centres in Germany be retrofitted with new lighting in the first quarter of 2009.
- Introducing a pilot load optimisation system to increase the tonnages transported between parcel hubs. The large savings from the pilot led to a swift roll out of a comprehensive system in mid-2007. This has helped increase container load levels by 9%, saved millions of Euros, and reduced greenhouse gas emissions by around 4,400 tonnes.
- The project determined that whilst photovoltaic systems were environmentally beneficial and affordable, for structural engineering reasons it was not feasible to retrofit them on to existing parcel centres. However, the DHL Leipzig parcel hub has been designed at the outset to accommodate a large photovoltaic array on its roof.



DHL Leipzig parcel hub with photovoltaic array

Overall, the research project has identified that many of the environmental technologies should be integrated into the construction plans and tenders for new logistics facilities.

Carbon reduction measures across the Deutsche Post DHL road fleet

The company employs a wide range of strategies to ensure it is cutting emissions across the fleet. These include:

- Fleet renewal
- Fuel efficiency
- Vehicle scheduling
- Dynamic route planning
- Low emission vehicles

Fleet renewals

In Germany alone, the company operates close to 55,000 vehicles, broken down in the table below according to European emissions standards⁷⁸. Fleet renewal policy is regarded as key to ensuring rapid introduction of a modern fleet which will eventually meet Euro 5 standard. The table below shows good progress towards meeting these higher standards in just one year.

⁷⁸ From 2008 and 2009 sustainability reports www.dp-dhl.com/SR2009/servicepages/downloads/files/entire_dp_csr09.pdf and [/www.dp-dhl.de/sustainabilityreport/2008/factsfigures/keyfiguresenvironment.html](http://www.dp-dhl.de/sustainabilityreport/2008/factsfigures/keyfiguresenvironment.html)

Table 14.2: Road fleet (Germany)⁷⁹ Euro emissions standards

	2007	2008
EEV1	163	160
Euro 5	95	301
Euro 4	8,679	26,078*
Euro 3	27,878	20,115
Euro 2	15,415	6,351
Euro 1 & comparable	3,627	786
Total	55,857	53,791

*note figure due to both new vehicle purchases and reclassification of vehicles from Euro 3 to Euro 4

Fuel efficiency

An example of how the company is driving fuel efficiency in its fleet is the corporate policy of ensuring all new trailers are 'teardrop' shaped. This produces a 10-15% fuel efficiency as well as increasing the trailer's loading capability.

Vehicle scheduling

In 2004, Bristol city council partnered with DHL to consolidate deliveries made to 64 downtown retailers. The shared arrangement helped ease congestion by reducing commercial vehicle movements by 75%, equivalent to eliminating 157,000 truck kilometres per year.

Dynamic route planning

In downtown Berlin, DHL EXPRESS has tested the functionality and efficiency of its own in-house developed SmartTruck innovative route planning technology. This completely new concept for the industry in inner-city areas aims to provide a better service to customers whilst reducing fuel consumption and lowering CO₂ emissions. Two delivery vehicles were fitted with dynamic route planning software in a three month pilot project supported by the German Federal Ministry of Economics and Technology. The systems respond to real time traffic information and problems such as traffic jams and roadworks and calculate and adapt the best route in advance. The aim is to deploy SmartTrucks on some 160 Express routes in Berlin as well as in other inner city areas, rural areas and abroad.

Low emission vehicles

The search for low emission vehicles is a key pillar of the *GOGREEN* programme. The Group has initiated more than a dozen pilot projects around the world in order to test out various types of low emission vehicle, including delivery trucks specially designed for urban areas as well as hybrid, electric and energy efficient gas engines. The Group has determined key criteria for a successful delivery vehicle including:

- low CO₂ emissions;
- reliability;
- ease of use; and,
- inexpensive to maintain.

Novel internal combustion engine for urban deliveries

In Lyon, France, DHL Express and Renault have begun testing of a prototype Renault truck with an internal combustion engine which can switch into a clean, quiet mode as it enters urban areas. Employing a sophisticated electronic measurement system, as the truck enters an urban centre the technology notifies the driver to switch the truck into a clean,

⁷⁹ Data is not available for road fleets in other countries. However, since the Group's fleet renewal policies are similar across countries, the company assumes that the technical status of their global fleet is very similar to the German fleet.

quiet mode. This limits parts of the engine responsible for torque and acceleration which are not required at low speeds. Furthermore, the truck is designed to be quieter during loading operations.

The pilot project, part of the EU's FIDEUS (Freight Intelligent Delivery of Goods in European Urban Spaces) programme, aims to improve the efficiency and reduce the environmental impact of deliveries in city centres, aims to find the optimal settings for safety, decreased CO₂ emissions and noise pollution.

Hybrid vehicles

Since hybrid truck technology is still in its infancy and total project costs are considerably higher than those for conventional vehicles, in 2008 Deutsche Post DHL became the first logistics company in Europe to trial hybrid trucks in its operations. Two hybrid trucks (a Mercedes-Benz Atego BlueTec Hybrid and a Mitsubishi Fuso Canter Eco Hybrid) were added on a trial basis with DHL EXPRESS' operations in the UK and MAIL transport in Germany. The tests will seek to verify whether hybrid vehicles can generate between 15 - 20% less greenhouse gases than conventional gasoline or diesel-powered vehicles.

In deploying these vehicles, the Group drew on its past experience with hybrid-electric powertrains in Japan where the first hybrid truck was delivered to DHL Express Japan from Mitsubishi Fuso in July 2006. This particular vehicle became Japan's first hybrid light duty truck to meet Japan's long-term emissions regulations introduced in 2005. Designed for city delivery, it remains one of the most fuel-efficient commercial hybrid vehicles available. Even during stop-and-go driving it is up to 20% more efficient than conventionally-powered trucks and results in over 40% reductions in both NO_x and particulates.

Electric vehicles

DHL Exel Supply Chain in Bristol has begun testing a Smith Electric Vehicles truck in order to know what their limitations are and to determine to what extent the company's infrastructure and those of their customers will have to be modified. The 7.5 tonne vehicle is the most powerful zero emissions truck on the market with a top speed of 80 kilometres per hour and capable of travelling 160 kilometres on a full charge. The weight of the battery packs are compensated to some degree by ultra light, state-of-the-art panels which are also fully recyclable. The result is an electric vehicle with a payload capacity up to 4,000 Kg. The Smith Electric delivery truck in Bristol is one of three currently undergoing testing in the UK.



A 7.5 tonne e-truck manufactured by Smith Electric Vehicles

Alternative fuels

In Brazil, 71 twin-tank vehicles are running on both normal and compressed natural gas (CNG) and in India 250 vehicles run on liquid petroleum gas (propane).

Biofuels

The Group is also testing vehicles powered by biofuels derived from plant (e.g. rapeseed) and biogas derived from household and animal wastes. In Sweden, a heavy van running on biogas was introduced in April 2002 and has since been expanded. In Switzerland, a similar project started in 2004 where DHL Switzerland operates biogas courier vans. The vans run on "Kompogas" produced from kitchen waste. The biogas trucks replace old vehicles in

areas where methane gas refueling facilities exist. When locally produced biogas is not available, a contract is made with gas producers to pay a premium for "green" biogas although the gas tanked might be a mix of biogas and compressed natural gas (CNG). The premium ensures that the biogas is allocated to the DHL vans and trucks.

To ensure the Group's actions on biofuels fulfil environmental and ethical criteria, guidelines have been developed.

Carbon reduction measures in the aviation fleet

As of November 2007, DHL used a total fleet of 349 owned and dedicated/chartered aircraft of which around two-thirds was equipped with jet engines, and subject to international emissions and noise standards. The rest mainly comprised of small turboprop aircraft used as feeder aircraft for the main network flights.

Deutsche Post DHL currently has a policy to use newer or brand new aircraft whenever it is able and its overall policy is replace over 90% of its jet aircraft by 2020. However, due to restructuring initiatives in the DHL Express USA operations, this policy target will be restated in the 2010 Sustainability report. It has also been revamping old aircraft with the addition of winglets to improve fuel efficiency.

Given their exposure to aviation, the EU ETS is now starting to affect the Group. Winfried Haeser notes that despite the system being confirmed at the EU level, Deutsche Post DHL still needs to establish how monitoring will take place and what baseline setting should take place. A regional scheme like the EU ETS is also not ideal for a global player like Deutsche Post DHL, so the Group will have to work hard to achieve their carbon efficiency target.

Carbon neutral service offering

DHL Neutral Services was created in 2007 to act as an in-house carbon consulting unit for Deutsche Post DHL operations (see box below) and its customers. It brings together research scientists, heating and electrical engineers, management consultants and logistics professionals. The division ensures that the most appropriate energy efficiency measures are being employed across the Group estate together with opportunities for renewable and combined heat and power (CHP).

DHL-owned chilled food warehouse, UK

Each year this distribution centre handles 30 million cases of food for supermarkets and produces 8,185 tonnes of CO₂. In 2007, DHL Neutral Services engineers initiated a Carbon Footprint Assessment using a web-based questionnaire to calculate the warehouse's carbon emissions based on activities covering property, transport and operations. The resulting report identified that the site's carbon emissions come from gas, electricity and diesel usage. This assessment allowed DHL Neutral Services to come up with a detailed Carbon Action Plan, finished in 2007, with recommendations for reducing, replacing and neutralizing the carbon footprint. The plan provides both short-term solutions that can be implemented quickly and cheaply as well as longer-term strategic actions. For example, it suggested replacing the heating and lighting systems and optimizing the voltage transformers, changes that would cut the carbon footprint by 15% and save about €60,000 in operating costs. Longer-term, the Action Plan suggested replacing the warehouse's current inefficient refrigeration system and building a wind turbine which could provide clean power for the site.

The goal of DHL Neutral Services is to help customers manage carbon as they would manage any other aspect of their business - with an eye for operational efficiency and cost reduction. The division aims to achieve a carbon neutral supply chain in the very near future. It will also play a key role in helping the Group achieve its *GOGREEN* target of 30% emissions reductions by 2020.

The service offering to companies outside Deutsche Post DHL also offers significant industry leadership, differentiation and competitive advantage within the carbon-intense transportation and logistics sectors.

16.4.2 External actions and measures

Reducing customer miles

Deutsche Post DHL has introduced the PACKSTATION concept in Germany to cut down on passenger car travel by avoiding the need to visit the post office during opening hours. The company has built a network of parcel machines (see picture below) to enable users to pick up parcels from their local PACKSTATION. A study⁸⁰ recently completed in Cologne, found that PACKSTATION cut down passenger car traffic in the city by 35,000 kilometres a year, leading to large reductions in CO₂, particulates and NO_x.



Carbon neutral services

Deutsche Post DHL was the first logistics firm to offer customers the option to send their shipments in both a low-carbon and carbon-neutral manner, under the GOGREEN product and service range. Whilst a certain amount of product is transported using a growing fleet of alternative fuel and advanced technology vehicles, the Group has embraced carbon offsetting as its preferred method of neutralising the emissions generated by customers who have signed up for its GOGREEN products and services package.

A range of certified climate protection projects have been selected which are both internal and external to the Group. Internal projects include:

- the purchase of additional vehicles with alternative propulsion units; and,
- the solar installation at the new DHL hub in Leipzig.

The Group's external projects include:

- a bio-methane gas plant in Germany;
- support of a hydroelectric power plant in Brazil;
- the reforestation of illegally exploited rain forests in Latin America; and,
- solar energy projects in Sri Lanka and India.



⁸⁰ <http://www.dp-dhl.de/sustainabilityreport/2006/environment/sustainableproducts/packstation.html>

A further innovation to this service offering has recently been introduced. Global Forwarding involves a split mode transport to cut down on air transport. For example, a package that was previously flown from China to Germany may now be shipped by sea to Dubai where it will then be flown the remaining leg. The overall effect will be to only partly reduce the speed of transit but create large cost savings and CO₂ reductions for the customer.

Deutsche Post DHL Carbon Management

Deutsche Post DHL Carbon Management is responsible for managing the carbon credits for *GOGREEN* shipping products and services. Its primary responsibilities are: accounting for carbon credits; monitoring the *GOGREEN* production scheme; ensuring that the supply and demand of carbon credits are matched; and documenting that used credits are retired.

The Group's Carbon Management programme is a voluntary carbon accounting and emissions reduction programme operated in accordance with the Kyoto Protocol's goal of reducing global greenhouse gas emissions.

Both the *GOGREEN* programme and the Carbon Management's processes and emissions-calculations methodology were successfully verified in 2006 and are now validated annually by SGS.

Facilitating consumer uptake of renewable energy

In Deutsche Post's retail outlets throughout Germany, the company acts as a broker of 'green' electricity on behalf of "LichtBlick - die Zukunft der Energie GmbH & Co. KG".

Subcontractors

Since Deutsche Post DHL's long-term carbon efficiency target includes subcontractors, the Group is committed to developing methods to assess those emissions and identify measures to reduce carbon emissions.

Deutsche Post DHL spent over €9 billion in 2008 on products (e.g. IT, consumables like paper) and services (e.g. office services) which gives it enormous purchasing power and an opportunity to influence the sustainability of their supply chain. In 2007 it introduced a Supplier Code of Conduct which covers the environment as well as ethical criteria, Health and safety and other areas.

Continuous improvements are being made to the Code including around the purchase of more environmentally-friendly alternatives. For example, the company is currently switching to recycled and sustainably sourced paper across all its operations where such paper is available, up from 80% of its operations in 2008.

To support the Code's implementation, the company has developed guidance notes for their procurement teams and in 2008 trained more than 500 of their buyers on the content of the Code.

Key message for SMEs is to look at strict environmental management across their operations, especially if they operate a production site, since this will help to identify key risks, major areas of wastage and areas for emissions reductions. An EMS helps set priorities and, importantly, enables a continuous improvement process to be established. This will ultimately help to drive down CO₂ emissions.

In Germany, Deutsche Post has several thousand subcontractors ranging from one-man bands to large firms. Recognising that it is difficult for firms to work to the same standards, Deutsche Post DHL will start to consult to determine what common ground can be achieved and then seek to set in place agreements which set out terms and conditions etc.

Faster progress is expected in the aviation and marine sectors because there are far fewer subcontractors (i.e. around 200).

16.5 Impact on company performance

Customer relations

The efforts of Deutsche Post DHL to implement a wide range of environmental technologies across its operations together with new and innovative client services are starting to impact on sales.

For example, in 2006, *GOGREEN* services required 1,000 tonnes of carbon reductions. By 2008, this need had increased dramatically to 16,000 tonnes. Clearly this is an indicator of how strong the market is for such carbon neutral services and how aware customers now are. Obviously these are the initial stages of growth for a service that could eventually be much larger. Deutsche Post DHL estimates, for example, that for every customer choosing *GOGREEN* there are perhaps another five who currently stick with the standard service offering. However, customer feedback suggests that these same customers are impressed that Deutsche Post DHL is “doing the right thing” and the reactions to the climate change measures across the Group is always very positive.

Sales/Profits

The company also recently heard from a client that they were awarded a major contract, beating a leading competitor, explicitly because of their overall approach to the environment. The company regards this as a very strong confirmation of their Sustainability Strategy and a clear message that excellent sustainability performance also helps improve their competitiveness and success in the marketplace.

Awards

The Group’s approach to sustainability has been recognised by various sustainability indices which evaluate a company’s performance against a broad range of sustainability criteria. Increasingly investors are analysing such indices to inform their investment decisions. Deutsche Post DHL is currently part of the following indices⁸¹:

- The Financial Times FTSE4GOOD Europe and Global Indices
- Vigeo’s 2008 Advanced Sustainable Performance Indices)
- KLD Global Climate 100 IndexDow Jones Sustainability Index (DJSI) series

In 2008, Deutsche Post DHL was also the only transport and logistics service provider to be included in the Carbon Disclosure Project’s Global 500 Leadership Index. This Index features those companies who not only measure their carbon emissions but also have in place CO₂ reduction targets and climate protection strategies. The company was recognised for its exemplary contribution to climate protection, through its *GOGREEN* programme and particularly its transparent reporting of its own carbon footprint and the measures it has implemented.

Climate Count in the USA has also recently rated Deutsche Post DHL as the best in its sector.

Investor confidence

Overall, the recognition by such ratings organisations that Deutsche Post DHL has achieved through its various carbon reduction measures places it amongst the leading companies in the world for environmental performance. The fact that the Group sees “cutting carbon as cutting costs” will inevitably translate into much greater investor confidence and support, especially during the current economic downturn.

⁸¹ See page 7 for full list of ratings www.dp-dhl.com/SR2009/servicepages/downloads/files/entire_dp_csr09.pdf

Such actions will also much give greater confidence to Deutsche Post DHL clients around the world, particularly those that are keen to also act in an environmentally responsible manner.

Additional benefits

Investment in carbon emissions reductions is leading to other benefits for the company including:

- It is seen as a motivating factor for employees;
- it is helping to attract high quality talent;
- it provides a better image and enhances the company's reputation to wider society.

16.6 Impact on jobs and skills

16.6.1 Impact on jobs

Deutsche Post DHL has yet to calculate the overall impact of its measures on jobs, either directly or indirectly through secondary or tertiary impacts of climate change policy drivers.

However, *GOGREEN* will help improve their cost position and competitiveness – and thus help secure and possibly create jobs as the business becomes successful. Given that the Group is operating in a very low margin business, it recognises that it is generally hard to create jobs. At corporate headquarters new teams have been created including the *GOGREEN* team and DHL Neutral Services but relative to an employee head count of 500,000 these additions are not large.

However, the company is keen to point out that without its greenhouse gas reduction programme, Deutsche Post DHL would be worse off than they are. Furthermore, such measures will also help the Group to weather the recession better than it otherwise might.

16.6.2 Impact on skills

A variety of training methods are used by Deutsche Post DHL to raise awareness of environmental matters and improve the skills of their 500,000 employees. These include:

- e-learning tools;
- brochures;
- dedicated intranet on *GOGREEN*;
- subject experts within the Group who may be consulted by staff.

The collection of energy and environmental data across the Group has also been found to raise awareness of issues and also highlights the importance to employees that the company places on its environmental performance. All feedback is that employees support the approach taken and would the company to be even stricter in the measures it undertakes.

In the EXPRESS division, 50,000 delivery drivers are being trained on fuel efficiency and improving loads factors. Evaluation of drivers of the new Teardrop shaped truck showed that some made every effort to try to maximise the fuel efficiency of their vehicle, going beyond what might otherwise have been achieved – i.e. achieving 20% fuel efficiency compared to an expected gain of 10%. The conclusion seems to be that the benefits of using a carbon efficient instrument are made far greater when operated by trained staff.

In the aviation sector, the company piloted a successful initiative to improve the capacity utilization of their cargo aircraft through training and staff incentives. The loading of cargo containers is now optimised so that more can be carried by each aircraft, reducing flights, cost and minimising emissions. The procedure is now being rolled out worldwide.

The company is keen to engender a culture of environmental awareness amongst its staff and also use their employee's ideas to help further advance the corporate commitment to

carbon reductions. In 2008, for example, the MAIL division ran an idea management scheme to generate information and know-how within the company. Run over four weeks, the programme involved 160,000 employees across Germany and generated over 11,000 proposals for change in the Group. The best ideas have already been implemented; the rest are currently being tested at one pilot site and will be rolled out across the Group if successful.

The company firmly believes that any environmental education and awareness training it conducts will benefit employees in their private lives, helping them to adopt more environmental behaviours.

16.7 Future implications of climate policy drivers

16.7.1 *Increased stringency of existing climate change policy drivers*

The Group may review its 30% carbon reduction target in 3-5 years time since it may turn out to be less ambitious by then.

16.7.2 *Implications of new climate change policy drivers*

Deutsche Post DHL believes that its comprehensive internal and external carbon reduction strategies positions it well for dealing with any new climate change drivers.

16.8 Lessons for other companies and sectors

There are several findings and lessons from the experiences of Deutsche Post DHL which give valuable insights to others:

- Making fundamental change to such a large organisation takes time and energy and requires an overall vision of where the company should try to move to. The *GOGREEN* programme has therefore been an essential requirement.
- High level buy-in from senior management is necessary – CEO Frank Appel is chair of the *GOGREEN* Internal Steering Committee.
- The benefits of using a carbon efficient instrument are made far greater when operated by trained staff.
- It is hard to create jobs in very low margin businesses but without greenhouse gas reduction programmes, companies are generally worse off financially and may be less able than their proactive rivals to weather market downturns.
- It is necessary to continually revisit corporate policy targets in light of structural changes within the company. This in turn may create new pressures on other areas of the business to cut emissions further to compensate. For example, the restructuring of DHL's Express USA operations in 2008 will lead to the Group aircraft fleet renewal policy having to change.

17 CASE STUDY 15: MENZIES DISTRIBUTION LTD

17.1 Summary

Menzies Distribution, part of John Menzies plc, is a leading provider of wholesale distribution and marketing services to the newspaper and magazine supply chain in the UK, with an approximate 35% market share. To remain at the forefront of its sector, the company has implemented a nine point action plan of co-ordinated technological and training and awareness raising measures to quantify and reduce carbon emissions across its operations as well as the wider supply chain.

The company has already made excellent progress in reducing its carbon footprint. A range of technological improvements together with driver training programmes have been used to achieve 13% carbon emissions reductions over the period 2001 and 2006. Through full roll out of its action plan, the company is seeking to further reduce this by 17% by 2011, enabling it to achieve an overall 30% reduction over a 10 year period.

Since the company regards operational costs and CO₂ emissions as being “joined at the hip”, it is clear that reducing one will lead to corresponding reductions in the other. It is therefore fully committed to its stringent carbon reduction strategy.

Menzies Distribution’s approach to carbon management and reduction is also regarded as a vital element in its overall business strategy, not least because magazine and paper distribution is a low margin business. In 2008, for example, the company increased operating profits by 2% to £23.9 million on turnover of £1.25 billion – a 1.9% margin.⁸² Part of the reason for this is that the sector is now comprised of fewer, bigger customers; competition for contracts is intense; and strict time windows are in place for delivery schedules. The company is therefore keen to ensure it continues to make further efficiencies and cost savings whilst still maintaining its high levels of service and customer satisfaction. Reducing carbon emissions is a key part of that strategy.

Indeed, the company believes that adopting an industry leading stance on carbon management is supporting its drive to win new business, especially since, increasingly, new tenders now ask about environmental performance.

The company has also begun to see evidence that its proactive stance on carbon emissions management, and the positive results it has achieved, is making the industry more alert both to the potential threats from inaction and the opportunities that arise from a reduction programme. During 2009 the company aims to achieve the Carbon Trust Standard⁸³ which will also send a signal to the wider sector about the benefits of action.

Whilst the various carbon reduction measures undertaken by Menzies Distribution have not led to direct or indirect jobs, the company feels they have created a far more stable business environment which ultimately preserves and even enhances job creation.

Recognising their efforts in improving skills and training in this area, the company has also recently been invited to join a joint UK Ministerial strategy initiative on progressing Low Carbon Skills, organised by the Department of Business, Enterprise & Regulatory Reform and Department of Innovation, Universities and Skills. The work will feed into the UK Government’s future Low Carbon Industrial Strategy⁸⁴ which it is currently consulting on.

Some of the key lessons from Menzies Distribution include the need to move quickly from establishing an emissions benchmark for any given year, into deploying innovative

⁸² John Menzies plc 2008 results http://www.johnmenziesplc.com/assets/pdf/JohnMenziesplc_Results_Presentation.pdf

⁸³ <http://www.carbontruststandard.co.uk/UsingtheStandard/CarbonReductionCommitment/tabid/129/language/en-GB/Default.aspx>

⁸⁴ <http://interactive.berr.gov.uk/lowcarbon/>

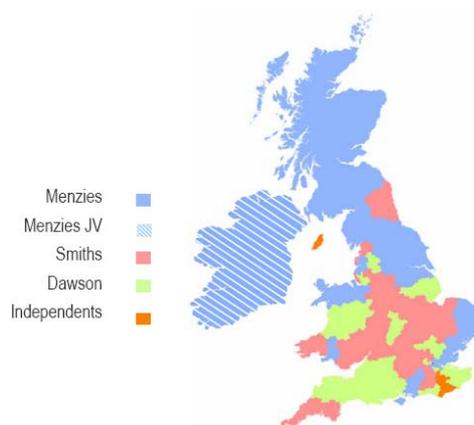
technologies and instigating training – companies that get hung-up over refining their emissions audits will lose precious time in driving down emissions and reducing costs. At the same time, implementing programmes to continuously monitor operational processes so that inefficiencies and poor practices do not creep back in are important after the initial enthusiasm behind introducing new initiatives has worn off. Having a carbon ‘champion’ at the board level to drive forward change is vital; and, educating from within the organisation (e.g. training the trainer), so that good practices are cascaded and skills and ‘corporate’ knowledge is enhanced is a powerful mechanism for quickly rolling out training.

17.2 Introduction

Menzies Distribution and Menzies Aviation are the two operating divisions of John Menzies plc, one of Scotland’s largest and oldest companies. The firm now operates a worldwide logistics business with its two divisions operating in distinct business-to-business (B2B) sectors. It recognises that business success depends on providing an efficient, high quality, time critical service to its customers and partners.

This case study focuses on Menzies Distribution, a leading provider of wholesale distribution and marketing services to the newspaper and magazine supply chain in the UK with an approximate 35% market share (see schematic below).

Each day the firm, which employs 4,000 full-time equivalents (FTEs), delivers 7.4 million copies of newspaper and magazine products to 23,000 retailers across the UK and Ireland (through a joint venture). In carrying out this operation, the firm travels a daily total of 117,000 miles⁸⁵, leading to significant levels of carbon emissions and environmental pollution.



Source: Menzies 2008 Report

Magazine and paper distribution is a low margin business. In 2008, Menzies Distribution represented £1.25 billion of the Group’s total turnover of £1.67 billion. Despite a growth of 2% in operating profits to £23.9 million, margins stood at 1.9%.⁸⁶ Part of the reason for this is that the sector is now comprised of fewer, bigger customers; competition for contracts is intense; and strict time windows are in place for delivery schedules. The company is therefore keen to ensure it continues to make further efficiencies and cost savings whilst still maintaining its high levels of service and customer satisfaction. Reducing carbon emissions is a key part of that strategy.

⁸⁵ www.enviromenzies.com

⁸⁶ John Menzies plc 2008 results http://www.johnmenziesplc.com/assets/pdf/JohnMenziesplc_Results_Presentation.pdf

17.3 **Key climate change policy drivers for change so far**

Until very recently, the primary driver for action on carbon reductions within Menzies Distribution was financial: good environmental practices also made sound financial sense.

During the past two years, in part based on growing environmental concerns from some its largest customers, Menzies Distribution has actively focused on a joined-up environmental strategy that has investigated the company's impact – and that of its supply chain – on the environment.

Interestingly, the introduction of the Low Emission Zone in London in 2008 was not the primary driver for Menzies Distribution to test out two electric vehicles in the city. The company was keen to do this anyway in order to determine their cost effectiveness and performance against other vehicle types as well as to be ready to embrace such technology if price points changed over time.

17.4 **What has the company been doing so far?**

Background

Over the past 15 years, Menzies Distribution has recognised that its operations have a significant impact on the environment. Over that time the company has been at the forefront of its sector through the implementation of a diverse range of environmental initiatives to measure, monitor and reduce environmental impacts. For example, one of the earliest initiatives it undertook in 1995 involved establishing the first 'direct-to-mill' process for ensuring unsold magazines were diverted from landfill and delivered back to the paper mill for de-inking.

Whilst early environmental measures were all conceived as sensible business propositions which sought to address both environmental impacts and yield tangible benefits to the company's bottom line, there was no overarching strategy that brought these measures together.

The shift in attitude within the company started in 2002 when Menzies Distribution made a major contribution to cross-industry research on Mass Balance of UK Newspapers, funded by Biffaward⁸⁷. The resulting 2004 report into the materials flows of UK newspaper through the UK economy⁸⁸ gave the firm its first real understanding of energy usage, carbon and related factors within its supply chain as well as its own contribution. For example, the analysis showed that, in terms of CO₂ emissions, the major sources were in newsprint production and landfill disposal. However, whilst transportation of newsprint, newspapers, and wastepaper all emitted around 20Kg CO₂ per tonne of newspapers conveyed compared with 1,000 to 3,000 Kg/tonne during newsprint production, Menzies Distribution reckoned that the sheer scale of its operation must mean it had a significant CO₂ footprint.

Since being involved with that study, Menzies Distribution has established that its own CO₂ footprint is 37,500 tonnes of CO₂ and has rolled out a wide range of technological and training initiatives aimed at reducing its footprint across its vehicle fleet (which accounts for 62% of its footprint), built environment as well as its wider supply chain. The following sections illustrate these measures which are also summarised in the company's nine-point action plan below:

⁸⁷ www.massbalance.org

⁸⁸ www.paisley.ac.uk/schoolsdepts/es/environment/documents/MassBalance.pdf

 Menzies Key Actions Agenda		
Revise fleet for fuel efficiency	Done & ongoing	Relative fuel economy measures Hybrids, Eco Starts, electric
Procure more Green electricity	Done	New 3 year Renewable contract from Oct 07 (exc Ireland)
Cut Electricity / Gas usage	Underway	Briar Study, Carbon trust Energy Reduction strategy - piloted
Drive more efficiently	Underway	SAFED & Driver training (piloted) Fuel information
Increase awareness	Underway	"News & Views" Operations Focus on Miles & Energy
Influence & Educate business partners	Underway	PPA, Unsolds Challenge, JIG, IFRA Influence Supply Chain Footprinting
Reduce miles travelled	Underway	Complete Optrak re scheduling project underway (1 yr)
Recycle More	Underway	Office papers done Depot cardboard initiative in hand
Reduce paper & packaging use	To Do	Digital product offer Evolution of I Menzies on web

17.4.1 Internal actions and measures

Carbon accounting

In 2007, Menzies Distribution embarked on a massive research effort which aimed to deliver a carbon footprinting model, both for the company and applicable to the wider industry. Collaborating with expert partners⁸⁹, a significant amount of data collection and carbon modelling enabled the company to produce a 'rough draft' carbon footprint for itself and its whole supply chain for 2006 (see box below). This highlighted the significant contribution that transport made to its overall footprint, and the total scale of warehouse energy impact, not previously viewed holistically. Encouragingly, a basic comparison with 2001 also showed that the company achieved a reduction of 5 Kg of CO₂ per tonne of product between 2001 and 2006: a 13% reduction.

Menzies Distribution also roughly calculated that their total supply chain produced circa 4.73 million tonnes per year, equivalent to 1.8% of the UK's total business and transport emissions of 264 million tonnes. Of this total impact, the physical distribution of product overall emitted 189,000 tonnes of CO₂. The company was therefore able to determine that its own footprint of 37,500 tonnes represented 20% of the distribution total.

This 'first cut' supply chain estimate has since been further refined by other studies and totals are believed to be of this order of magnitude. This reflects another Menzies view that reasonably considered modest modelling can give as good a steer on areas for action as highly detailed modelling and investigation, and in the interests of progress it is better to take action based on the former and not just wait on the latter.

⁸⁹ Research was led by Heriot Watt University in Edinburgh with contributions from the Freight Transport Association (FTA), Pira International (consultants to the paper, packaging, print and publishing sector), the Carbon Trust and others.

Carbon Audit of Menzies Distribution

The total CO₂ footprint for Menzies Distribution in 2006 was estimated at 37,503 tonnes:

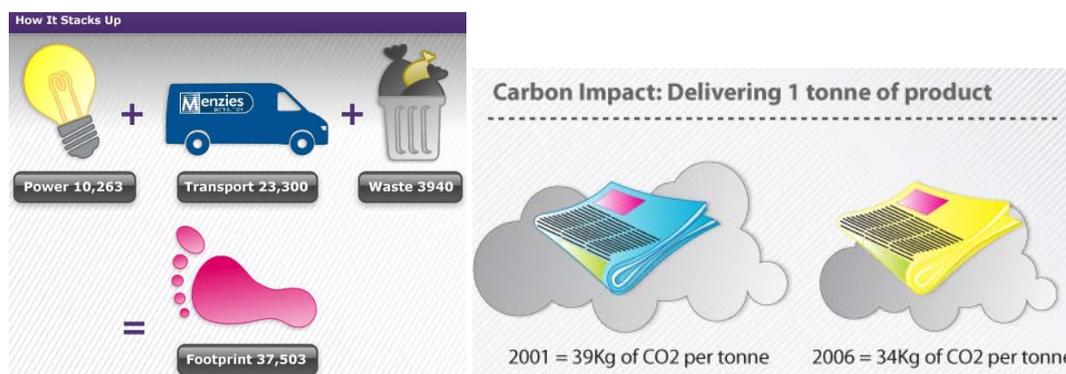
Energy usage – accounted for 10,263 tonnes of CO₂ (27%)

Transport – accounted for 23,300 tonnes (62% of the firm's footprint):

- Distribution (both Menzies' own vehicles and subcontractor vehicles) 22,443 tonnes
- Business travel of Menzies employees 300 tonnes
- Powering internal materials handling equipment (e.g. forklift trucks) 557 tonnes

Materials and waste - accounted for 3,940 tonnes of CO₂ (11%):

- Office paper usage 1,006 tonnes
- recycling and landfill of waste 2,746 tonnes
- Transport of waste 187 tonnes



Source: www.enviromenzies.com

A year after the initial carbon accounting work was completed, and having seen the tremendous progress made in the company, David Morton, Strategic Development Director, felt that Menzies Distribution might well be able to become a carbon neutral distributor. To enable the company to progress towards this objective, it appointed several consultancy firms⁹⁰ to refine the methodology used in generating their carbon footprint and establish a more formal energy reduction programme.

The consultancy ECCM for example played an important role by:

- reviewing the Heriot Watt carbon audit to verify the approach;
- creating a new topic guide illustrating what was in and out of scope;
- introducing new data for 2007;
- helping to instigate a process of annual carbon reporting for the company;
- advising that, for the purposes of ensuring the company had internationally recognised emissions data, data collection should switch to carbon dioxide equivalent (CDE or CO₂e).

The work also helped Menzies Distribution to understand the challenges of making year-on-year comparisons against changes in business strategy and operations. This, along with modest scope extension, had the effect of increasing the company's carbon footprint to 42,000 tonnes CO₂ equivalent.

⁹⁰ Edinburgh-based ECCM (part of the CAMCO group), Briar Associates from the West Midlands and The Edge (UK subsidiary of Swedish STFI-Packforsk)

Fleet based approaches

Menzies Distribution first started to work on its fleet efficiency in 1998 when it implemented a computerised vehicle scheduling package (Optrak) to enable more efficient route planning across the Menzies estate. This led to reduced fuel costs. From that point, the range and breadth of initiatives aimed at understanding and reducing emissions has steadily grown. For example, between 2003 and 2005, the company undertook a transport review which addressed both human and environmental impacts of its logistics operation. As part of this process, during 2004 the company expanded driver training initiatives it had initiated in 2003 by arranging for “Safe and Fuel Efficient Driver” (SAFED) training programmes to be rolled out to over 200 employees driving larger vehicles (i.e. over 3.5 tonnes). A manufacturer supported this initiative by providing a suitably metered vehicle to conduct the driver training and a trainer was hired on a full-time basis from the Freight Transport Association (FTA)⁹¹. The trainer then went round each depot training drivers to the same standards to achieve a common standard across the company.

This work was continued through 2006 and expanded to include ‘train the trainer’ sessions, so that the work could be cascaded throughout the organisation. The duration of the programme allowed the company to assess the real value of its investment in skills development for its employees and also to the company’s bottom line - SAFED training yielded fuel savings in the range 5-15%. Sustaining driver interest and behaviour however presents a challenge likely requiring annual refresher training and requiring full consideration of trade off costs. Over time Menzies Distribution has moved to see this as a worthwhile trade off and is now actively moving to create such a training regime as part of new Driver CPC continuous professional development.

Overall, the company’s review of transport arrangements and its driver training programmes helped the company deliver a modern vehicle fleet configured and driven to maximise fuel efficiency.

In 2008, with fuel prices rapidly increasing, transport once again came under scrutiny for efficiency improvements. Curiously, given that it is a logistics company, transport had up to this point been a fairly invisible part of the overall carbon reduction strategy and regarded by some in management as the “final frontier”. One of the principle reasons for this is the very early delivery schedules undertaken by the company fleet. This meant that few in management ever saw or understood the true extent of transport practices. Another reason was the fact that there had been initial scepticism in the late 1990’s with vehicle scheduling, particularly amongst longer serving transport managers and staff. This issue had never fully been addressed.

Three main areas were identified for review and change:

- Vehicle scheduling;
- Fleet fuel efficiency; and,
- Driver training (*see under Skills section*).

The company established a four man team to carry out a one year project to fully investigate vehicle scheduling. The project would review every delivery route driven, completely rethink and challenge current approaches and look at ways of reducing the number of miles travelled by their fleet. At the outset, management was hopeful that cost efficiencies of up to 2.5%, on top of previous ad hoc exercises, might be achievable. However, early results have uncovered significant efficiencies and more are expected as the rollout occurs across the company. The impact to the bottom line, and carbon savings, has been impressive with efficiencies in excess of 5% now forecast – a huge result for a company already proud of its record in continually striving to improve efficiency.

⁹¹ <http://www.fta.co.uk/services/training/>

To improve fleet fuel efficiency, the company has an on-going process of reviewing vehicle performance as well as identifying opportunities for innovative new vehicle usage. The Menzies Distribution fleet comprises of diesel only vehicles on a leased basis. Lease terms typically run for between 3 and 5 years, ensuring a modern and efficient fleet. All new additions to the fleet since January 2007 run on Euro IV engines.

The following initiatives have been undertaken:

- Menzies has introduced eleven Mercedes-Benz 'Eco-start' sprinter vans. These vans save fuel by automatically cutting their engines whilst at a halt such as traffic lights. A continuous monitoring programme has been implemented and, assuming efficiency savings are realised, further vans of this type will be procured for the denser traffic areas.
- The company has introduced over 45 automatic Isuzu vans which have been found to yield fuel savings of around 15% over the previous equivalent vehicles deployed.
- The purchasing of an electric vehicle to service part of their London area made the company the first news and magazine distributor to use such a vehicle. Whilst the 5.5 tonne MODEC vehicle (chosen against an alternative model by Smiths) makes 30 drops each day in London's Westminster area, the overall commercial performance is impaired by the vehicle's heavy weight (two tonnes heavier than a standard delivery van) as well as technical issues with the batteries and premium purchase costs. Another major drawback was the inability of the company to get the leasing industry sufficiently interested in adopting such a vehicle, primarily because of the significantly higher price point and uncertainty on residual values.



- Menzies has run another type of proprietary electric vehicle designed by a smaller innovation business working in this sector. For the past three years this has given excellent results. The success of this particular project has led to a further four of these vehicles being ordered. These will enter service in mid-2009 and look like providing a commercially and operationally viable option to traditional diesel vans. The company hopes that its actions in supporting this smaller innovator will stimulate more interest from others in electric vehicles and enable the price point for similar vehicles to be reduced over time.

Built environment

Menzies Distribution first started to reduce the environmental impacts of its estate in 1993, when it initiated a 'Model Warehouse' project. This sought to redefine how new warehouses would be commissioned. The latest energy efficiency standards were a key consideration. This was followed by the company commissioning an award-winning⁹², sustainable and energy efficient headquarters in Edinburgh.

One of the initial findings of ECCM's carbon audit work was that buildings should again become an important target area to implement carbon reduction programmes, not least

⁹² Winner of the: Lighting Industry Federation (LIF) Lighting Design Awards 1996 (awarded to schemes that demonstrate proven energy savings); Edinburgh Architectural association Award 1996; RIBA Award 1997.

because of the future impact of the Government's Carbon Reduction Commitment scheme that might affect Menzies Distribution because of the size of its estate's energy bill.⁹³

Consequently, throughout 2007, the company conducted studies in conjunction with The Carbon Trust and Briar Associates, an energy consultancy, to investigate energy usage over time and company sites and to explore new approaches to reducing energy in its warehouses. This work led to a range of poor energy practices being uncovered, with significant levels of waste, including:

- Heating units set so they never switched off;
- Air conditioning and central heating operating at the same time;
- Lights left on overnight in unused parts of warehouses.

Besides regional briefings to employees and an action plan to ensure key basic behaviours were adhered to, the company decided to install motion sensors, more efficient lighting, timed activation scheduling, and smart meters capable of automatically taking half-hourly readings. Overall, energy savings of over £100,000 have been achieved across the company's warehouses in the 6 months since the warehouse energy reduction programme was initiated. The use of energy usage data has also highlighted practices that hitherto had gone largely unchallenged leading to further changes in operational practices.

Carbon offsetting and renewable energy

In addition to process changes, in order to explore all possible avenues for mitigating its carbon footprint, the company conducted a thorough appraisal using modelling of the costs, benefits and potential risks of both carbon offsetting (using overseas projects) and carbon sequestration (using Scottish forestry). This led to both being dropped in favour of a switch to a verifiable source of 100% renewable energy for their UK sites for the next three years; and a focus on delivering tangible company controlled operational improvement. This process was not without issue since the sale of green electricity is by no means transparent.

Accreditation

During 2009 the company aims to achieve the Carbon Trust Standard⁹⁴ - the highest recognised endorsement of progress on carbon reductions, since it reflects real progress in achieving emissions cuts over a three year period - and is currently engaged in the relevant assessment process. This will reduce its costs of participation in the Carbon Reduction Commitment (CRC) (subject to final confirmation of CRC regulations). This is because organisations that achieve the Standard achieve a higher ranking in the league table in the first phase of the CRC. The Standard is one of only two designated 'early action metrics' in the CRC; the other is installation of automatic meter reading (AMR).

17.4.2 External actions and measures

Raising awareness within the sector

Given the overall size of the Menzies Distribution supply chain CO₂ footprint (estimated at circa 4.73 million tonnes) compared its own footprint (37,500 tonnes), the firm is acutely aware that the most important single thing it can do to reduce CO₂ is encourage their supply chain to implement CO₂ reduction initiatives. The company points out that achieving just a 1% reduction in their supply chain's footprint would outstrip the entire Menzies Distribution CO₂ footprint.

⁹³ The CRC applies to the John Menzies plc group so includes the energy consumption of Menzies Aviation.

⁹⁴ <http://www.carbontruststandard.co.uk/UsingtheStandard/CarbonReductionCommitment/tabid/129/language/en-GB/Default.aspx>

Its own carbon footprinting work has been important for raising awareness of the impact of carbon to the sector, not least the carbon impacts of shipping unsold magazines from the producer to the retailer and back again. The traditional approach taken in the publishing sector is to look at the marginal cost of printing and selling product, such that it is clearly cheap to manufacture and sell 10% extra product in anticipation that sales might occur.

By applying strict carbon accounting to production and sale of extra product, the marginal cost of production of the millionth magazine is the same as the first magazine off the press. Clearly this could lead to behavioural change within the sector, especially if this cost is applied to the shipment of unsold magazines both out to shelf and back.

The carbon models therefore became a crucial tool for informing both the Joint Industry Group (JIG)⁹⁵ - established to address the industry's own problems via self-regulation rather than regulatory intervention - and, in particular, supporting the commitment by the newly formed Carbon Footprint Group of the Periodical Publishers Association (PPA) to create a more detailed footprint model for the entire supply chain. The PPA has now produced a Carbon Calculator for publishers so that a common methodology is applied across the sector. It is hoped that this will lead to behavioural change.

The groundbreaking work that Menzies Distribution carried out in the 1990's on reducing the level of unsold magazines sent to landfill has now been taken up by the JIG as part of its 'Unsolds Challenge'. The latest JIG annual report of 2007/8 states that its

"members have made a significant commitment to reducing the amount of unsold copies in the supply chain. This worthy initiative is an extremely important one, not just to address the wastage from a commercial and efficiency aspect, but also as a first step for the news industry in recognising and acting on its responsibility to reduce carbon emissions."

The company has also promoted the results of its internal benchmarking and carbon reduction programmes to a broad audience which includes its customer base, supply chain and industry group. Senior Menzies Distribution representatives have also visited many forums to share and debate the company's work including in the UK (e.g. FTA, Chartered Institute of Logistics and Transport (CILT), PPA, National Federation of Independent Retailers) and overseas, in particular to IFRA⁹⁶ which represents over 3,000 publishing and supplier organisations to the media sector across 80 countries.

In general, though, its supplier base, especially SMEs, have been very slow and reluctant to engage with the climate change agenda. There is yet to be a realisation that this is an important business issue, particularly with the short term planning horizons of many SMEs.

Raising awareness to the general public

Recognising that there was also a paucity of good quality information in the public domain addressing the environmental impacts of distribution and logistics generally and of the newspaper and magazine distribution sector in particular, the company designed an on-line reference website - www.enviromenzies.com - to promote and educate stakeholders on the firm's impact on the environment. The website also illustrates the firm's overall place in the supply chain and wider industry.

⁹⁵ The Joint Industry Group comprises the Association of Newspaper and Magazine Wholesalers (ANMW), the Newspaper Publishers Association (NPA), the Periodical Publishers Association (PPA), the Association of News Retailing (ANR), the British Retail Consortium (BRC) and the National Federation of Retail Newsagents (NFRN). It was launched in 1998 following the Office of Fair Trading's decision not to refer the newspaper industry to the Monopolies and Mergers Commission. JIG was created specifically to address issues identified in the MMC's report, in particular measures to monitor wholesaler service, by addressing the industry's own problems via self-regulation rather than regulatory intervention. Through consensual industry decisions, JIG has been responsible for generating a number of industry initiatives through the creation of sub-working groups.

⁹⁶ www.ifra.com

Paperless operations

Future initiatives also include the introduction of 'iMenzies' which the company hopes to use to encourage its customers to access electronic information without the need for paper documentation.

17.5 Impact on company performance

Maintaining competitive advantage

Although the carbon reduction initiatives instigated by Menzies Distribution cannot be claimed as directly affecting sales and profitability, the cost savings brought about by carbon efficiencies are making for a leaner organisation which can maintain its competitive advantage. These results also provide good news to investors who increasingly wish to know about CO₂ impacts of business.

For example, almost all of the major 3-5 year contracts that Menzies Distribution has previously won have been retendered recently. The fact that the company was successful in both retaining and increasing its market share is ultimately because price wins contracts, and its carbon reduction programme is leading to improved cost efficiencies. It is the case that a strong track record in sustainability can make a difference. The company is of the belief that, everything else being equal, its progressive stance on carbon and the environment will help sway a customer into selecting its services over those of its competitors.

Menzies Distribution has found that against declining sales and underlying cost growth, carbon reduction measures have enabled costs to be reduced and margins maintained for a relatively small capital outlay.

Whilst it is true that major customers like Tesco and M&S like what Menzies Distribution is doing with respect to carbon emissions reductions, it does not necessarily lead to new business. However, it becomes another key business area where it is difficult for customers to find fault with prevailing practices which in turn can ensure contracts are maintained.

17.6 Impact on jobs and skills

17.6.1 Impact on jobs

Whilst the various carbon reduction measures outlined above have not led to direct or indirect jobs, they have created a far more stable business environment which ultimately preserves and even enhances job creation.

Furthermore, various business initiatives which cut costs and therefore maintain margins help win business. For example, the company sets up special project teams to examine how it can make its operations more efficient. Teams are typically established using existing staff who provide *ad hoc* support on top of their normal 'day' jobs.

Day-to-day training programmes help to up skill employees. For example, the SAFED training is enabling staff to reduce the carbon footprint of their individual roles within the business.

Most training is delivered from within the company. For example, warehouse energy reduction was delivered by management who had themselves been trained by the Menzies Distribution facilities manager.

Menzies Distribution believes that its adaption to climate change drivers need not necessarily lead to job losses and may conversely lead to net job growth. For example, by implementing more efficient routing, fewer drivers will be required. However, this will in turn enhance company competitiveness which should enable new business to be won, leading to new jobs being created. This is the case in current new business wins.

Menzies Distribution has not yet adapted their recruitment criteria to reflect the need for greater environmental awareness. However, an interesting finding is that new people

applying for jobs with the company are now asking about the company's environmental position. Thus, the company's progressive stance on carbon and the environment could soon start to be seen as a differentiator.

17.6.2 Impact on skills

Menzies Distribution has long recognised the importance of skills and training. It has also sought to match employee skills and training needs with the overall strategic objectives of the business. A good illustration of this occurred in the early 1990's. The company realised that many employees did not properly appreciate that it was a logistics company: the focus up to that point had been solely on the 'product'. Consequently, an early training initiative for depot managers aimed to highlight good logistics practices, endorse and position their competencies with the intent that this would improve operational efficiencies.

The range of technological innovations that the company has recently embraced does not diminish the importance it places on skills and training, not least because of the importance that drivers and warehouse operatives make to the overall achievement of the company's business objectives.

Improvements in the standards required for drivers are also demanding greater investment in skills and training. For example, goods vehicle drivers will from September 2009 require a Certificate of Professional Competence (CPC) which requires at least 35 hours of training over a 5 year period (equivalent to one day per year). Since Menzies Distribution sees the value in annual SAFED training - to reinforce good practices on a continual basis and maintain fleet fuel efficiencies - it has decided to roll out SAFED using lead assessors. A number of assessors will first be trained and then each will be responsible for carrying out training at their respective depots. This will help enable drivers to fulfil their training commitments under the CPC scheme and ensure consistency and both speed of roll out and ongoing sustainability of the training programme.

Menzies Distribution is also committed to ensuring all their drivers achieve the Skills for Logistics⁹⁷ (the Sector Skills Council for Logistics) supported National Vocational Qualification Level 2 (NVQ2) entitled "Carry and Deliver Goods". Part of this training programme is supported financially under the Government's 'Train to Gain' initiative. Based on excellent results at two depots, this programme is being actively rolled out across the Group and will be completed in 2009. One of the findings from the pilots was the large number of foreign national drivers employed by the company. The importance of achieving common standards, especially for those with English as a second language, is vital to the firm achieving its overall performance KPI's in a responsible manner.

The company recognises that it needs to go further and embed awareness of carbon and environmental issues into its overall training programme. To that end, the measures deployed to date have greatly improved awareness of climate related issues amongst management in depots. The company is also now including carbon and environment into supervisor training which will reinforce more strongly these messages where it has the greatest impact.

It is also creating employee "home help" information to assist its employee action the good environmental practices they learn in the workplace in their home lives.

Recognising their efforts in improving skills and training in this area, the company has also recently been invited to join a joint UK Ministerial strategy initiative on progressing Low Carbon Skills, organised by the Department of Business, Enterprise & Regulatory Reform and Department of Innovation, Universities and Skills. The work, which will involve a number of companies already deploying innovation approaches to meeting the challenge of

⁹⁷ www.skillsforlogistics.org

low carbon business, will feed into the UK Government's future Low Carbon Industrial Strategy⁹⁸ which it is currently consulting on.

17.7 Future implications of climate policy drivers

17.7.1 Increased stringency of existing climate change policy drivers

Menzies Distribution believes that its commitment to achieve a further 17% reduction in carbon emissions between 2006 and 2011, by setting tough yet realistic and tangible targets for improvement, sets it apart from many other companies.

It also regards its nine point action plan for carbon reductions as the best possible risk mitigation it can do at the moment against a backdrop of uncertainty in both the political arena but also the physical impacts of climate change.

17.7.2 Implications of new climate change policy drivers

Menzies Distribution's proactive stance on carbon reductions will place it in a good position for coping with future policy challenges. One of the most prominent to impact on the company will be the introduction in the UK of the Carbon Reduction Commitment (CRC). CRC will be a mandatory emissions trading scheme that the UK Government believes will force business to improve energy and carbon management skills, particularly in relation to metering, reporting and reduction measures. Starting in 2010, CRC aims to cost-effectively deliver carbon emissions reduction and cost savings in up to 5,000 large organisations in the service sector, public sector and other less energy-intensive industries. The UK Government aims to reduce carbon emissions in large non-energy intensive organisations by 1.2 million tonnes of carbon per year by 2020.⁹⁹

The company is also considering how, moving forward, it can create new business opportunities in its supply chain and customer base.

17.8 Lessons for other companies and sectors

There are a range of findings from the experiences of Menzies Distribution which give valuable insights to others:

- Until a company embarks on its carbon reduction 'journey' and starts to assess its carbon emissions, it will have little real idea as where the major impacts lie and how emissions might be reduced. However, it is important that organisations do not analyse to the nth degree but instead push ahead and instigate initiatives which are sensible and are likely to lead to early returns.
- Understanding the clear linkage between costs and carbon emissions was a profound realisation for Menzies Distribution. Many other firms are likely to be currently missing this linkage and thus failing to act.
- Discussions of carbon accounting can give an opportunity to foster collaboration with close competitors and others in the supply chain without getting into sensitive cost data. The work that the newspaper and magazine sector has done on its 'Unsold Challenge' is a good example of this.
- A carbon 'champion' at the Menzies Distribution board level has been vital in driving forward changes. Furthermore, the Managing Director of Menzies Distribution is highly supportive of the work on carbon carried out within the company and has helped communicate this to the board of John Menzies plc.

⁹⁸ <http://interactive.berr.gov.uk/lowcarbon/>

⁹⁹ Currently the CRC will cover all organisations whose electricity consumption through half hourly meters is greater than 6,000MWh/yr in 2008 – equivalent to an annual electricity bill of around £500,000. All energy other than transport fuels will be covered. During a planned introductory phase, due to start in April 2010, all allowances will be sold at a fixed price. From April 2013, allowances will be allocated through auctions with a diminishing number of credits available over time. Participants will also potentially be able to buy EU ETS allowances to comply with their emissions cap – this would be a buy-only link to effectively create a price ceiling for credits in the CRC. Source: <http://www.carbontrust.co.uk/climatechange/policy/CRC.htm>

- In a large organisation “no one owns the minutiae”, so it is important to establish programmes to benchmark and continuously monitor operational processes.
- Each business unit needs to be continually monitored. By seeking to address one area, and then moving on to another, it is possible for poor practices to creep back in and for opportunities to embrace novel environmental technologies to be overlooked. In this way a company might miss out on potentially radical reductions to its carbon footprint.
- Education from within organisations (e.g. train the trainer) is a powerful and cost-effective mechanism to cascade good practices to the business. This also improves the overall ownership of skills within the business, boosting ‘corporate’ knowledge.
- Companies can significantly help to raise overall community environmental awareness through engendering good carbon reduction/environmental practices in their workforces which are then deployed outside the workplace.
- Menzies Distribution believes that its adaption to climate change drivers need not necessarily lead to job losses and may conversely lead to net job growth. For example, by implementing more efficient routing, fewer drivers will be required. However, this will in turn enhance company competitiveness which should enable new business to be won, leading to new jobs being created.
- Year on year comparisons are difficult to achieve if the nature of the business is changing at the same time. Menzies Distribution has not got hung up over its inability to look back for example at pre-2001 figures because it is confident it can continue to make large future reductions going forward. However, it will be important for companies starting out on a carbon benchmarking exercise to ensure that the model adopted is able to account for changes in the business over time.
- Being able to appreciate that a ‘carbon crunch’ is going to arrive sooner or later has been important for Menzies Distribution in taking action now and avoiding the panic and resulting knee jerk reactions of inaction. Furthermore, by being near the front the company has been able to help shape developments that affect its operations, rather than being at the back following.