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VOLUME I – AN ENGAGEMENT STRATEGY**



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EXECUTIVE SUMMARY

This report for LAPFF examines the risk posed by climate change to businesses with long-term research and development (R&D) programmes and makes recommendations on opportunities for investor engagement. Climate change risk is divided into physical risks, from changes in temperature, precipitation, storm events etc, and regulatory risk.

This report finds that both physical and regulatory climate risks are increasing and are likely to be significant over the next twenty to forty years – the same timeframe as many pension investments. Companies that anticipate and prepare for these changes are likely to gain market advantage in a carbon constrained world. Engaging with companies to develop a coherent and proactive climate policy will help secure safe returns on investment and mitigate environmental degradation.

From an engagement perspective, the relationship between pension fund trustees and pension fund managers is crucial. Any engagement process must seek to influence fund managers attitudes towards climate change risks and encourage them to require more from the companies in which they invest.

A difficulty in engaging with fund managers however is that in spite of the volume of research extolling the benefits of corporate action on climate change, the straight financial case is weak in relation to other financial drivers. A more direct process of engagement that addresses the principles upon which fund managers make investment decisions, such as their investment principles, their reliance on financial metrics and how they interact with companies is likely to lead to more success in bringing about the desired change in corporate behaviour than more technical financial research.

In particular, pension funds have the opportunity to use their Statements of Principles (SIPs) as well as a dedicated activism policy to clarify their objectives on engaging with companies and fund managers. An activism policy on climate change for example may include the following elements:

- The presence of a corporate policy on climate change
- Greater disclosure of emissions information
- Pressing for direct actual emission reductions
- Disclosing financial risks under various regulatory scenarios (see example shareholder resolution on disclosure of climate risks in appendix)
- Using the company's influence to encourage others to reduce emissions
- Developing products and services to exploit new market opportunities

Consistent with good practice on fund management activism, the agreed approach to engagement should be written into the fund management contract and performance against the contract reviewed regularly. The activism policy could be updated every one or two years, taking account of developments in the institutional investment field. Fund managers should respond with a clearly articulated response explaining how they will meet the aims set out in the policy.

1. INTRODUCTION

This report for LAPFF examines the risk posed by climate change to businesses with long-term research and development (R&D) programmes and makes recommendations on opportunities for investor engagement.

This report represents Volume I of three volumes. Volumes II and III describe sector level and company level risks and opportunities relating to climate change in more detail.

Climate change risk is divided into physical risks, from changes in temperature, precipitation, storm events etc, and regulatory risk. These are not the only types of risk that companies face regarding climate change: companies also face shareholder pressure, as reflected in shareholder resolutions, and consumer pressure in support of companies that openly support measures to reduce emissions of greenhouse gases.

LAPFF's focus on sectors with significant R&D expenditure reflects the desire to engage with sectors that are on the one hand exposed to climate change risks (for example, sectors with long term R&D programmes are often energy intensive and hence are affected by increases in the cost of energy), and on the other hand are able to develop new technologies and products to respond to these new pressures.

Company approaches to climate change issues differ in a variety of ways. A wide body of research supports the hypothesis that companies adopting proactive environmental and climate change responses tend to perform better financially. This report provides detailed information on what determines best practice in corporate responses to climate change. This information can be used to engage with companies and to encourage them to improve their strategic response to climate change risks.

As well as risk mitigation, this report also describes business opportunities presented by climate change. Opportunities arise through the exploitation of emerging markets in renewable energy and emissions trading. Emissions trading is likely to impact on many firms and present opportunities to sell excess emission reductions under mechanisms such as the Kyoto Protocol and the EU Emissions Trading Scheme. Proactive behaviour in managing climate risks may also lead to more favourable responses from regulators, the public, customers and investors.

For these reasons, early and extensive action on climate change issues is recognised as best practice by most assessment studies.

2. PHYSICAL CLIMATE CHANGE RISK

2.1 Climate change impacts

The Earth's climate system has demonstrably changed on both global and regional scales since the pre-industrial era, with some of these changes attributable to human activities. Human activities have increased the atmospheric concentrations of greenhouse gases and aerosols since the pre-industrial era. The atmospheric concentrations of key anthropogenic greenhouse gases (i.e., carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and tropospheric ozone (O₃)) reached their highest recorded levels in the 1990s, primarily due to the combustion of fossil fuels, agriculture, and land-use changes (IPCC 2001).

Projected impacts vary considerably due to uncertainty about future anthropogenic emissions of greenhouse gases and about environmental response systems. However, IPCC (2001) emphasise that the stakes associated with projected changes in climate are high. Numerous earth systems that sustain human societies are sensitive to the climate and will be impacted by changes in climate. Impacts can be expected in ocean circulation, sea level, the water cycle, carbon and nutrient cycles, air quality, the productivity and structure of natural and agricultural ecosystems, and the geographic distribution, behaviour, abundance, and survival of plant and animal species. The main changes which humans will experience are:

- ◆ Warmer global temperatures, resulting in warmer winters and hotter summers.
- ◆ Precipitation changes: in Europe, precipitation is expected to increase in the winter but decrease in the summer. Precipitation events are also expected to become more intense.
- ◆ Sea level changes: sea level will rise due to warmer global temperatures and the melting of the Antarctic ice cap and the Greenland ice sheet.
- ◆ Storm frequency and intensity increases – note though that there is less scientific certainty regarding these smaller-scale events.

Climate changes are already occurring around the world with significant impacts on economies and societies. The following changes have already been observed in the UK's climate in recent years (source, ODPM, 2004):

- ◆ Central England temperatures rose by almost one degree centigrade during the twentieth century.
- ◆ The 1990s was the warmest decade in central England since records began in the 1660s.
- ◆ The thermal growing season for plants in central England has lengthened by about one month since 1900.
- ◆ Heat waves have become more frequent in summer while there are now fewer frosts and winter cold spells.

- ◆ Winters over the last 200 years have become wetter relative to summers throughout the UK.
- ◆ A larger proportion of winter precipitation in all regions now falls on heavy rainfall days than was the case 50 years ago.
- ◆ After adjusting for natural land movements the average sea level around the UK is now about 10cm higher than it was in 1900.

Human systems that are sensitive to climate change include mainly water resources; agriculture (especially food security) and forestry; coastal zones and marine systems (fisheries); human settlements, energy, and industry; insurance and other financial services; and human health. The vulnerability of these systems varies with geographic location, time, and social, economic, and environmental conditions. A list of possible impacts on the economy, society and health is shown in Appendix 1.

2.2 Response to climate change

Society's response to climate change can be divided into two actions: mitigation and adaptation. To mitigate means to take steps to avoid or minimize negative impacts. In relation to climate change, it refers to measures to reduce emissions of greenhouse gases, so that the impact of global warming is reduced. GHG emission reductions required to stabilise CO₂ concentrations in the atmosphere are quite severe (see appendix). Policy makers are aware that the emission reductions agreed under the Kyoto Protocol (5% reductions from 1990 baseline by 2010) are inadequate to sufficiently cope with climate change. In reflection of this fact, the UK government aims to reduce CO₂ emissions by 60% from 1990 levels by 2050, as recommended by the Royal Commission on Environmental Pollution.

However, mitigation alone will not be sufficient to cope with the impacts of climate change. Society therefore needs to adapt to changing environmental conditions. Over the past decade, more attention has been paid to mitigation issues than to adaptation issues. Now that climate change is visibly occurring, adaptation risks and responses are coming under closer scrutiny. However, there is little published research on the physical risks that sectors and companies may face, and how proactive companies have responded to this risk. Highly exposed sectors such as insurance have certainly looked into the risks in detail, but other sectors have given the risks of climate change scant attention. To some extent, weather-related issues may be part of the business as usual operation of companies and tackling them may not be seen as requiring new approaches. However, the scale and nature of the physical impacts faced by some companies will in some cases necessitate separate assessments and actions. Some companies may have a number of locations at risk of flooding. Others may be affected by long term changes in their markets. Warmer winters, for example significantly reduce the demand for gas (used for space heating). In contrast hotter summers increase the demand for air conditioning and the demand for power. More storms will increase the breakdown and maintenance of electricity pylons, telecommunication systems, and transport systems. Therefore companies need to pay greater attention to adaptation measures, to complement existing mitigation measures.

3. REGULATORY CLIMATE CHANGE RISK

Regulatory risk refers to the potential costs associated with new regulations introduced to reduce GHG emissions. The scope of these regulations may include:

- ◆ Energy and emission related taxes – the Climate Change Levy
- ◆ Energy performance standards for certain products – e.g. domestic appliances
- ◆ Emission limits – e.g. the European Emissions Trading Scheme
- ◆ Voluntary agreements to reduce emissions – e.g. the Auto-Oils programme – an initiative involving the European car manufacturers and oil companies to reduce pollution levels from cars.

Since CO₂ emitted from the burning of fossil fuels is the most prevalent cause of global warming and is the target of most climate change regulations, these regulatory risks mostly affect sectors with energy intensive manufacturing operations and those whose products and raw materials consume energy. The simple impact of these new regulations is that the cost of using fossil based energy will increase. These changes will add to manufacturing costs of energy intensive companies thereby depressing profits. It will also change consumer choices of energy using products. The high price of petrol has already started a switch towards high efficiency cars such as the petrol/electricity powered Toyota Prius, and energy efficient light bulbs.

These market changes brought about by climate change regulations illustrate the opportunities they also create. Firms that are able to see these opportunities early and develop products to meet these changes customer needs will have more sustained business performance than those that are slower to innovate.

3.1 The Kyoto Protocol

The Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1997 in Kyoto, Japan. 84 countries agreed on the need for an average 5.2 per cent reduction in industrialised countries' 1990 emissions of man-made greenhouse gas emissions (CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆) over the period 2008 – 2012. The reductions are not the same for all countries but depend on the degree of economic development, population, climate and size. For example, Canada committed to cut its 1990 emissions by 6%, UK by 12.5%, Germany by 21% and the US 7%.

The Protocol needed the ratification of governments representing 55 countries emitting 55% of the industrialised world's emissions to come into force. This was achieved when Russia ratified it in 2004. The US has not ratified the protocol. Developing countries face no immediate reduction target. However, these countries can host projects that reduce emissions (known as Clean Development Mechanism projects) and sell the emission reduction credits to those developed countries with targets.

3.2 The EU Emissions Trading Scheme

From January 2005, over 12,000 large emitters of CO₂ in Europe will be subject emission limits, covering around 50% of European greenhouse gas emissions. The EU ETS will be the largest emission trading scheme in the world. Sectors covered will include: combustion plants, oil refineries, coke ovens, iron and steel plants, and factories making cement, glass, lime, brick, ceramics, pulp and paper. Sites covered by the directive will be able to buy emissions to achieve compliance with their targets, and sell emissions if they exceed their targets. In this way the cost of reducing emissions is expected to be achieved at lowest cost. Companies directly covered by the EU ETS will not be the only companies affected. Electricity and gas prices will also increase, putting pressure on all energy using businesses.

This report contains examples of companies who are based in Germany, the UK, Japan and the United States. The status of each of these countries in meeting Kyoto, EU ETS and other targets are briefly assessed below.

UK and Germany

The European Union is required to reduce its greenhouse gas emissions by 8 % from 1990 to 2008-2012 under the Kyoto Protocol. This target is distributed amongst Member States through the EU burden sharing agreement. Under the Burden Sharing Agreement, Germany and the UK are required to reduce their GHG emissions by 21% and by 12.5%, respectively. In terms of CO₂ emissions both countries have pledged to meet even stricter domestic policy targets: in Germany, the government has set the goal to reduce CO₂ emissions by 25% between 1990 and 2005, and in the UK the objective is to reduce CO₂ emissions by 20% between 1990 and 2010.

While in most other industrialised countries, GHG emissions have increased since 1990, in Germany and the UK emissions of the specified basket of six greenhouse gases has decreased considerably. In fact, Germany and the UK are among the few industrialised countries which are on track to meet their Kyoto targets. However, these reductions appear less commendable given both countries have benefited from special circumstances providing extraordinary opportunities for emission reductions. In Germany, the breakdown and restructuring of the East German economy after reunification in 1990, combined with the closure or upgrading of relatively extremely dirty Soviet manufacturing facilities, meant that Germany was “Kyoto compliant” by 1992.¹ In the UK, the liberalisation of the electricity and gas markets in the early 1990s resulting in a fuel switch from carbon-intensive coal to natural gas, combined with higher nuclear output, resulted in extensive GHG emission reductions (Eichhammer 2001). However, these ‘windfalls’ have been accompanied by various climate-specific and more general environment policy measures at the national, regional, and local levels, which have also resulted in emission reductions. Although it appears certain that both countries will meet their Kyoto targets, it is unlikely that either country will meet their more ambitious domestic CO₂ reduction targets without additional policy effort (Eichhammer 2001).

Japan

The cabinet of Japanese Prime Minister Junichiro Koizumi officially endorsed the Kyoto Treaty's ratification in June 2002. Japan agreed to reduce its

¹ http://www.numberwatch.co.uk/german_kyoto_protocol_hoax.htm

greenhouse gas emissions by 6% below 1990 levels, but emissions rose by six-plus percent in 1999 alone, putting total emissions at 6.8% above 1990 levels. Although Japan's greenhouse gas emissions fell in 1997 and 1998 due to an economic slump, 1999 saw emissions increase again. In 2002 GHG emissions were 7.6% higher than the 1990 level.²

Although energy saving measures have been implemented, changes in lifestyle and economic trends have continued to push GHG emissions up. Worrying trends identified include the increasing number of one-person households, increasing number of air conditioning units per household, and increasing car ownership and use.

United States

The United States, the world's largest GHG emitter, rejected the Kyoto Protocol in March (2001), shortly after President Bush took office. His administration said that participation in the pact would hurt the U.S. economy. President Bush questioned the validity of scientific research which finds that the global climate is warming. According to the Kyoto Protocol, the USA should cut its greenhouse gas emissions by 7% from the 1990 level by the year 2010. The USA has 4% of the world's population, but emits 25% of all greenhouse gases.³

Between 1990 and 2000, US GHG emissions increased by an average of 1.3 percent per year (14.2 percent total over the decade). Recently, President Bush has announced a goal of reducing GHG intensity from 183 to 151 tons per million dollars of GDP over the 2002 to 2012 timeframe. However, due to projected GDP increases, a GHG intensity decline of this size actually implies a 14.3 percent increase in the absolute levels of greenhouse gas emissions by 2012. The President's GHG goal is not dissimilar to past emission growth rates and will not, under any plausible scenario, actually reduce greenhouse gas emissions (WRI 2002b).

3.3 Other climate change risks

There are other climate change related risks which will affect a company's long term performance. These largely revolve around societal pressure for climate change friendly policies. These concerns may be expressed as a boycott (e.g. the ExxonMobil boycott (see Volume III), or as shareholder resolutions. Shareholder resolutions are more frequent in the US than in the UK since US shareholders need to have owned just \$2,000 in stock for a year or more to draw up and vote on resolutions. These resolutions promote or enforce actions within the corporations.⁴ In the UK a shareholder resolution must be circulated to the shareholders and put to the AGM (Annual General Meeting) if it is requested in writing by 100 shareholders on whose shares there has been paid up an average sum of at least £100 nominal value.⁵

CERES is currently part of a campaign, for example, calling on the US Securities and Exchange Commission (SEC) to eliminate any doubt that publicly traded companies should be disclosing the financial risks of global warming in this manner. Few companies discuss climate risk in their SEC

² <http://www.japantimes.co.jp/cgi-bin/getarticle.pl5?nn20040617f1.htm>

³ http://www.dea.met.gov.na/news/items_2001/010321news1.htm

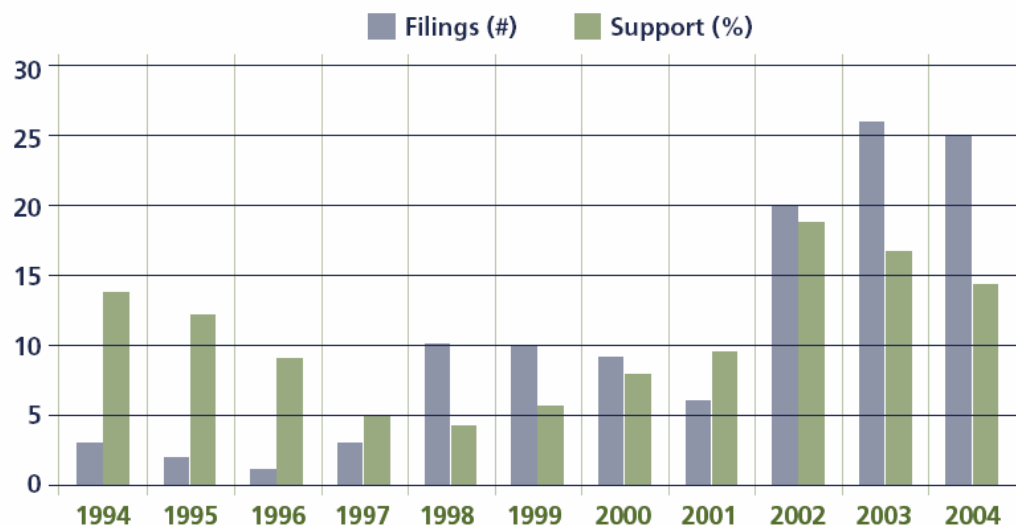
⁴ <http://www.earthrights.org/usalead/shareholder.shtml>

⁵ <http://archive.greenpeace.org/climate/arctic99/reports/uksharebrief.html>

filings, and even fewer elaborate with financial analysis. SEC’s guidelines stipulate: “Specific known trends, events of uncertainties that are reasonably likely to have a material impact on a company’s financial condition or operating performance must be discussed in the MD&A [Management Discussion and Analysis of Financial Conditions and Results of Operations]”.

The first global warming resolution was filed with Exxon Corp. in 1990, by Friends of the Earth. The president of this environmental group, Brent Blackwelder, owned just 400 shares in the oil company. His resolution calling on Exxon to “reduce production of carbon dioxide emissions from its energy production plants and facilities worldwide” gained support from 6.3 percent of the total shares voted. Exxon and its successor company, ExxonMobil, has been a repeated recipient of global warming resolutions ever since due to its reluctance to accept the human and economic link to global warming and its strong opposition to government controls on greenhouse gas emissions (CERES 2004b).

U.S. Global Warming Shareholder Resolutions, 1994–2004 (CERES 2004b)



2002 was an historic year for the filing of global warming resolutions. Highlights included:

- ◆ A tripling of global warming resolutions.
- ◆ A doubling of the average vote in favour of global warming resolutions, reaching a record 18.8% support level.
- ◆ Resolutions sponsored by a multi-billion dollar public pension plan from the State of Connecticut.
- ◆ Increased shareholder demand for information on the financial impacts of global warming.

The 2003 AGM season produced even higher voting results at some widely held companies, including a 22.2% vote at ExxonMobil, a 22.6% vote at General Electric and a record-high 26.9% vote at American Electric Power (CERES 2004b). Given that these firms are the largest firms in their respective industries, these votes demonstrate that an important bloc of institutional

investors are now backing calls for greater corporate disclosure of the financial risks posed by global warming.

Most 2004 resolutions took direct aim at independent directors serving on companies' boards, asking them to conduct assessments of the financial risks associated with global warming. The proposals noted that reinsurer Swiss Re had begun asking companies applying for directors and officers liability insurance about their preparations for regulation of greenhouse gas emissions. (See Appendix 2 for the full text of a sample 2004 shareholder resolution).

Partly for this reason, seven of the companies receiving global warming resolutions in 2004 reached agreements with shareholder proponents that led to their withdrawal from company proxy statements. Companies in most instances agreed to the proponents' request that "a committee of independent directors of the Board... assess how the company is responding to rising regulatory, competitive, and public pressure to significantly reduce carbon dioxide and other greenhouse gas emissions and report to shareholders."

The first of these precedent-setting reports was issued by American Electric Power on August 31, 2004. Its independent board review found that up to \$1.5 billion of \$5 billion in planned company investments to retrofit its coal-fired generating plants potentially could be at risk if the U.S. government adopts regulations to cut carbon dioxide emissions below 2000 levels by 2020. The company also pledged to invest up to \$1.6 billion in a next-generation coal plant, to be completed by 2010, that emits substantially fewer emissions of greenhouse gases than conventional coal plants. Four other electric utilities - Cinergy, Southern, TXU and Xcel Energy - are conducting similar board-level assessments and will issue their reports by the spring of 2005. Other companies including oil companies also announced planned improvements in their response to climate change risks.

In 2004 shareholder support for global warming resolutions with three oil companies reached record levels of 27.0% at Marathon Oil, 31.4% at Anadarko Petroleum and 37.1% at Apache (CERES 2004b; see also oil and gas sector analysis, Volume II). The record-high votes at these companies suggest that the quality of a company's climate response is of increasing importance to institutional investors.

In summary, companies around the world are likely to face increasing regulatory and physical climate risks. These are likely to become increasingly important over the next twenty to forty years, as the physical process of climate change continues. This timescale matches closely with the financial interests of pension investments and pension investments will be closely tied to the impacts of climate change on economies. Pension investors therefore have a strong motivation to encourage investee companies to take a proactive and coherent stance on climate change.

4. METHODOLOGY

In this report, to assess the climate change risks faced by specific companies, we use published reports where possible, supported by company specific information from the company's website.

The primary source of information used in this study is the **Carbon Disclosure Project (CDP)**. The CDP provides a coordinating secretariat for a group of institutional investors that collectively managed \$10trillion in assets in 2003. In 2002 and 2003, this group contacted the 500 largest companies in the world by market capitalisation (the FT500 Global Index companies), asking for the disclosure of investment-relevant information concerning their greenhouse gas emissions. Company responses are analysed and scored by the following criteria:

Assessment criteria used by the Carbon Disclosure Project (2004)

Considers climate change to present risks and/or opportunities	
Responsibility allocated for management of climate change related issues	
Strategy to prepare for emissions trading regimes	Monitoring developments
	Evidence of early engagement
Quantified GHG reporting	Emissions data disclosed
	Use of 3rd party reporting protocol/ verification
Emission reduction programs in place	Energy efficiency programs
	GHG reduction programs
Formal GHG reduction targets set with timeline	

CERES is a leading US coalition consisting of more than eighty environmental, investor, and advocacy groups working together to increase corporate environmental responsibility worldwide. It also includes more than seventy companies that have committed to continuous environmental improvement by endorsing the CERES Principles, a ten-point code of environmental conduct

For the past three years, CERES has been leading a national and international effort to educate and mobilise investors about the financial implications of global climate change on US companies. Among the results of this work is the **Investor Network on Climate Risk (INCR)** formed after their Institutional Investor Summit on Climate Risk at the United Nations in November 2003. The Investor Summit, the first of its kind in the US, brought together institutional investors representing over \$1trillion in invested capital to examine the financial risks of global climate change.

INCR is a group of state and city treasurers, public and labour pension funds and a host of religious- and socially-responsible investment funds representing over \$700 billion in assets. INCR is regarded as the principle investor network on climate change in the United States.

In 2003, CERES commissioned a study to examine how twenty of the world's largest corporate emitters of GHGs are factoring climate change into their business strategies and governance practices. This report was carried out by Douglas Cogan of the Investor Responsibility Research Centre, and is

referenced in this report as Cogan (2003). The criteria used in this report are more exacting than those used by the CDP. Some companies, such as Exxon Mobil, score high according to CDP's assessment, but low according to Cogan's assessment. Cogan examines 14 actions, split into five categories; these are shown in the figure below.

14 point climate change governance checklist (Cogan 2003)

Board Level	
1	Assign a committee of directors with direct oversight responsibility for environmental affairs.
2	Conduct a formal board-level review of climate change and monitor company response strategies.
Management Level	
3	Place the chief environmental officer in a position to report directly to the chief executive officer or the CEO's executive committee.
4	Make attainment of greenhouse gas targets an explicit factor in employee compensation.
5	Have the CEO issue a clear and proactive statement about the company's climate change response and greenhouse gas issue.
Reporting	
6	Include a statement on material risks and opportunities posed by climate change in the company's securities filings.
7	Issue a sustainability report based on the Global Reporting Initiative or comparable "triple bottom line" format, which includes a discussion of climate change and a listing of the company's greenhouse gas emissions and trends.
Emissions data	
8	Calculate and register greenhouse gas emissions savings or offsets from company projects.
9	Conduct a system-wide inventory of the company's emissions and report the results directly to shareholders.
10	Establish an emissions baseline (dating back at least 10 years) by which to gauge the company's greenhouse gas emissions and trends.
11	Make projections of future emissions and set firm, company-wide targets to manage and control them.
12	Hire a third party auditor to certify there are no material misstatements of the company's emission data.
Other actions	
13	Participate in an external voluntary greenhouse emissions trading program.
14	Purchase and/or develop renewable energy sources.

In addition to these cross-sector studies, a number of reports have been written on individual sectors, and even individual companies, regarding climate change risk. One such study is Goldman Sachs' (2004) assessment of the oil and gas sector according to the **Goldman Sachs Energy Environmental and Social Index (GSEES)**. One of the assessment categories is company response to climate change, which includes an examination of company action regarding:

- ◆ GHG targets and performance
- ◆ GHG levels
- ◆ GHG change
- ◆ Emissions trading
- ◆ Renewable energy

These sector and company specific reports also cover some of the physical impacts of climate change, and the risks and opportunities these pose. Another important information source regarding the physical impacts of climate change is the **UK Climate Impacts Programme (UK CIP)**.⁶ In general however the assessment of physical climate change impacts is in its early days and no extensive research has been carried out for many sectors.

Sector and company reports also provide information regarding general R&D as well as climate change specific R&D for sectors and companies. Plunkett's sector analyses also provide useful information regarding general trends in markets, although the information is US biased. Other useful information sources for sector descriptions and the nature of R&D include government websites and company websites

To place the assessment of climate related risks in context, we present in this report recent financial performance data for the profiled companies and sectors. The majority of the data is obtained from **Morningstar.com**.

⁶ www.ukcip.org.uk

5. AN ENGAGEMENT STRATEGY ON CLIMATE CHANGE

This report has identified climate change risks faced by nine sectors with significant R&D programmes. It has also examined sector and company responses to these risks. Climate change risks have been split into physical and regulatory risks. For most sectors, regulatory risks are seen to pose the most significant risks (and opportunities), and therefore receive the most attention. Direct risks of climate change by contrast are in most senses not material to company financial performance. This does not imply however, that all major companies do not have a role to play in supporting action for climate change risk management. Through these company's high public profile and R&D programmes they can influence and promote the development of solutions to the climate change problem.

5.1 Modes of Engagement

In principle, there are three key modes of investor engagement:

- i) Private investors/pension fund trustees -> companies
- ii) Private investors/pension fund trustees -> fund managers /institutions
- iii) Fund managers/institutions -> companies

For LAPFF the majority of pension funds are managed through fund managers within large investment institutions. Direct company interaction does take place but is much more limited. From LAPFF's perspective direct engagement with companies therefore relies on the relationship between fund managers and companies.

The route through with managers of mainstream funds will engage with companies on issues such as climate change is under the umbrella of Corporate Governance. It is often argued that climate change is an issue of such importance that for many firms the risks should be considered within the context of Corporate Governance. Some of the research highlighted in this report implies that fund managers and investor trustees could be neglecting their fiduciary duty to protect their investments if no action is taken to protect their assets from the risks of climate change and associated regulations.⁷

Yet in spite of the availability of this research the response from the corporate sector on climate change has lagged the pace that long term and informed investors would wish to see occurring. The process of engagement, and in particular the inclusion of the mainstream funds, is therefore crucial to fostering the necessary change in corporate behaviour.

Involving the mainstream funds in the engagement process is the focus of the challenge. Two recent quotes from leading US fund managers taken from their *Principles of Engagement* illustrate typical responses from mainstream fund managers in using proxy voting as a means of pressing social and ethical issues upon companies (these are US examples).

Merryl Lynch *The [Proxy Voting] Committee generally believes that shareholder meetings are inappropriate forums for discussion of larger social issues and opposes shareholder resolutions "micromanaging" corporate*

⁷ see for example: CERES, 2003, Value at Risk: Climate Change and the Future of Governance.

conduct or requesting release of information that would not help a shareholder evaluate an investment in the corporation as an economic matter. While the Committee is generally supportive of proposals to require corporate disclosure of matters that seem relevant and material to the economic interests of shareholders, the Committee is generally not supportive of proposals to require disclosure of corporate matters for other purposes”.

Vanguard Group. Vanguard Group proxy voting guidelines under the heading corporate and social responsibility issues:

We generally believe that these are “ordinary business matters” that are primarily the responsibility of management and should be evaluated and approved solely by the corporation’s board of directors. Often proposals may address concerns with which we philosophically agree, but absent a compelling economic impact on shareholder value (eg proposals to require expensing of stock options). We will abstain from voting on these proposals. This reflects our belief that regardless of philosophical perspective on the issue, these decisions should be the province of the company management unless they have a significant, tangible impact on the value of our investment and we don’t view management as responsive to the matter.

These types of responses illustrate the view that without a compelling financial case (which applies to many sectors, with the exception of the power or oil and gas sectors) intervention at board level – and specifically through the AGM process – is difficult to justify for mainstream investors.

Hence direct engagement with fund managers to change *their investment principles, their reliance on financial metrics and how they interact with companies* is likely to lead to more success in bringing about the desired change in corporates than more technical financial research.

There are signs that a change in attitude in fund managers is occurring. In the UK the Institutional Shareholders Committee (ISC) drew up their Principles of Engagement in 2002 requesting that institutional shareholders clarify and report on their responsibilities with regard to how and when they will take action with the companies in which they invest.⁸ Pension funds in the UK are also required to disclose their statement of investment principles (SIP). In the US, a parallel regulation introduced by the SEC in Jan 2003, requires mutual funds that invest in voting securities disclose in their statements of additional information the policies they use in how to vote proxies relating to securities held in their portfolios.

These are largely disclosure requirements on the engagement activities of institutional investors and do not lead to action per se. However, with this information investors have at their disposal much more information upon which to set and monitor fund management mandates in line with their own investment and engagement policies.

5.2 Engagement with Fund Managers

Through the pension fund’s SIPs and the fund manager’s Principles of Engagement, the mechanisms are being put in place to clarify the responsibilities of shareholder activism. As well as a SIP, best practice for a

⁸ The ISC Principles of Engagement was drawn up in response to the threat of legislation proposed in the Myner’s Review of 2001. (ref: Institutional Investment in the UK: A Review).

pension fund is to have an activism policy that provides a more detailed interpretation of the SIP. This is an appropriate place to include views on climate change. A fund manager's Principles of Engagement should then state how the fund intends to comply with the pension fund's SIP.

Good practice on the part of pension funds when drafting SIPs and associated policies, in the context of climate change would be based around establishing clarity on the fund's principles of engagement on climate change. Approaches may range from a minimal and relatively passive position to more active engagement. Typical approaches include engaging on:

- ◆ The presence of a corporate policy on climate change
- ◆ Greater disclosure of emissions information
- ◆ Pressing for direct actual emission reductions
- ◆ Disclosing financial risks under various regulatory scenarios (see an example of a shareholder resolution on disclosure of climate risks in Appendix 2)
- ◆ Using the company's influence to encourage others to reduce emissions
- ◆ Developing products and services to exploit new market opportunities

Consistent with good practice on fund management activism, the agreed approach to engagement should be written into the fund management contract and performance against the contract reviewed regularly. The activism policy could be updated every one or two years, taking account of developments in the institutional investment field. An important information sources providing up to date analysis of the US situation is www.ceres.org.

5.3 Generic Climate Change Engagement Issues

Either through direct dialogue with companies or through the fund manager, LAPFF trustees need to ask pertinent questions of the companies in which they invest. Some general questions can be asked of companies in the context of managing the risks and exploiting long term market opportunities brought about by climate change. These are separated into strategic and operational.

Strategic

1. Has a strategic risk and opportunity analysis been undertaken with regard to climate change? Ensure that this analysis takes into account:
 - ◆ Physical as well as regulatory risks of climate change. Physical risks currently receive less attention than regulatory risks, although this is changing. Climatic changes may require significant changes in operations and in demand for products; investors should ensure that companies have carried out thorough analysis of the risks and opportunities that a changing climate offers to their business.
 - ◆ All relevant market opportunities including those in the short, medium and long term, covering emissions trading and carbon taxes. Investors should obtain clear and unambiguous information regarding the financial risk that a company faces due to climate regulation. Shadow carbon prices

(reflecting expected emission costs for CO₂) should be used in investment decisions, and reasons provided if not used.

2. Does the company have a corporate policy on climate change and green house gas emissions?
3. Does the company participate in emissions trading scheme? If the company is not directly covered by the Kyoto Protocol or the EU Emissions Trading Scheme, there may still be opportunities to participate in the Kyoto Protocol's 'flexible mechanisms' such as the Clean Development Mechanism, which encourages companies in third world countries to reduce GHG emissions. The company may also be able to participate in the Chicago Climate Exchange.⁹
4. What evidence can the company provide demonstrating its involvement with climate driven R&D opportunities? Although many technologies are being research, fuel cell R&D has been found to exist across multiple sectors including the oil and gas, electric utility, automobile, and chemical sectors. Companies in other sectors are implementing fuel cells at some of their sites. Companies could therefore be quizzed on their involvement with this technology, along with other R&D projects. The pharmaceuticals company Baxter has a Product Sustainability Review tool which is applied to new products in R&D. This considers the global warming impact of the products throughout its lifecycle; this example could also be posed to companies to see if they have an equivalent structure in place for R&D projects.

Operational

1. Is there a senior level manager responsible for tracking climate change risks and opportunities on an ongoing basis? Ideally this should come under the responsibility of a board director.
2. Does the company monitor and report on its GHG emissions using a standard third party reporting protocol, such as the World Resources Institute/ World Business Council for Sustainable Development GHG Protocol.¹⁰ Companies should be encouraged to report on emissions from transport and from product use (e.g. using the car), and quizzed if they fail to do so.
3. Does the company have a greenhouse gas target? This should be stretching but achievable. This is a key criterion and companies should be encouraged to set themselves targets. Targets reviewed in this report range from 5% reduction per year to 1% reduction per year. There is no easy way to assess how challenging a target is for a company. However, the priority placed on climate change issues can usually be gauged from a number of factors including historic emission trends, targets, and evidence of emission reduction projects. Some sectors, such as the telecommunications sector, may face increasing GHG emissions due to the expansion of the 3G network. These companies should still be encouraged to adopt a GHG target, even if it allows for increases in emissions and is reviewed the following year.

⁹ http://www.chicagoclimatex.com/about/people_advisory.html

¹⁰ <http://www.ghgprotocol.org/>

4. Does the company report to its stakeholders on what it is doing on climate change?
5. Does the company participate in external initiatives that highlight the implications of climate change?
6. Has the company looked at generating power from renewable energy resources on its own sites (e.g. wind turbines, biomass combustion)?

5.4 Sector Specific Climate Change Engagement Issues

Sector specific responses to climate change reflect the exposure of that sector to physical and regulatory risks. Sector level engagement on climate change should therefore firstly ask companies whether they have a) assessed these risks and opportunities, and b) what they are planning to do in response.

The table below summarises the risks and opportunities resulting from climate change affecting each sector. In this table, opportunities are largely identified as R&D opportunities as they involve the development of new products to exploit new market opportunities. This can be used as a checklist for engaging with companies in these sectors.

Summary of climate change related risks and opportunities

Sector	Risks	Opportunities
Oil and gas	<ul style="list-style-type: none"> - Climate driven variation in demand - Subsidence of piping in frost areas - Sea level rise affecting refineries - Exposure to emissions trading regulations and carbon taxes 	<ul style="list-style-type: none"> - Increased demand for low carbon fuels - Transportation of gas e.g. LNG - Energy efficient oil refining - Carbon capture and storage - Cleaner fuels e.g. ethanol from waste and biofuels - Renewable energy technologies
Electric utilities	<ul style="list-style-type: none"> - Climate driven variation in demand - Hotter temperatures affecting cooling systems of thermal plants - Exposure to emissions trading regulations and carbon taxes 	<ul style="list-style-type: none"> - Pulverized coal technologies - Combined heat and power - Carbon capture and storage - Combined cycle gas turbines - Integrated gasification combined cycle systems - Renewable energy technologies
Automobiles	<ul style="list-style-type: none"> - Regulatory / voluntary constraints on emissions - Fuel taxes - Congestion charging 	<ul style="list-style-type: none"> - Hybrid electric vehicles - Fuel cell technology - Biodiesel technology
Aerospace, defence and aviation	<ul style="list-style-type: none"> - Riskier flying conditions due to weather extremes - Emissions limits imposed under emissions trading schemes 	<ul style="list-style-type: none"> - Development of efficient jet engines, of aerodynamic aeroplane design, and strong light materials. - The use of fuel cells as auxiliary power units in aeroplanes.
Chemicals	<ul style="list-style-type: none"> - Disruption to fertiliser and nutrition markets - Exposure to emissions trading regulations and carbon taxes 	<ul style="list-style-type: none"> - More energy efficient chemical manufacturing processes - Fuel cell membrane manufacture
Mining	<ul style="list-style-type: none"> - Impact on mining due to flooding - Emissions limits imposed under emissions trading schemes 	<ul style="list-style-type: none"> - More energy efficient mining and mineral treatment processes - Carbon capture and storage.
Food and drink	<ul style="list-style-type: none"> - Crop and fish stock damage due to changing weather patterns. - More volatile markets, eg impact of low summer temperatures on frozen goods - Impacts of emissions controls on livestock farming 	<ul style="list-style-type: none"> - Growing of crops nearer to domestic markets - Biotechnology - Increasing adaptive capacity of agro-forestry
Pharmaceuticals	<ul style="list-style-type: none"> - Increased costs of drug storage due to warmer temperatures 	<ul style="list-style-type: none"> - New drugs to meet the changing distribution and frequency of disease - Climate friendliness of products e.g. CFC use in inhalers
Telecommunications	<ul style="list-style-type: none"> - Risks to satellite and mast infrastructure due to storms - Increasing cost of energy, raising costs of higher energy services, 3G 	<ul style="list-style-type: none"> - Energy efficiency of base stations and handsets - Telecommuting & videoconferencing displacing physical travel

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APPENDICES

1 IPCC RESULTS

Examples of climate variability and extreme climate events and examples of their impacts (IPCC 2001, Summary for policy makers)

<i>Projected Changes during the 21st Century in Extreme Climate Phenomena and their Likelihood</i>	<i>Representative Examples of Projected Impacts^a (all high confidence of occurrence in some areas)</i>
Higher maximum temperatures, more hot days and heat waves ^b over nearly all land areas (<i>very likely</i>)	Increased incidence of death and serious illness in older age groups and urban poor. Increased heat stress in livestock and wildlife. Shift in tourist destinations. Increased risk of damage to a number of crops. Increased electric cooling demand and reduced energy supply reliability.
Higher (increasing) minimum temperatures, fewer cold days, frost days and cold waves ^b over nearly all land areas (<i>very likely</i>)	Decreased cold-related human morbidity and mortality. Decreased risk of damage to a number of crops, and increased risk to others. Extended range and activity of some pest and disease vectors. Reduced heating energy demand.
More intense precipitation events (<i>very likely</i> , over many areas)	Increased flood, landslide, avalanche, and mudslide damage. Increased soil erosion. Increased flood runoff could increase recharge of some floodplain aquifers. Increased pressure on government and private flood insurance systems and disaster relief.
Increased summer drying over most mid-latitude continental interiors and associated risk of drought (<i>likely</i>)	Decreased crop yields. Increased damage to building foundations caused by ground shrinkage. Decreased water resource quantity and quality. Increased risk of forest fire.
Increase in tropical cyclone peak wind intensities, mean and peak precipitation intensities (<i>likely</i> , over some areas) ^c	Increased risks to human life, risk of infectious disease epidemics and many other risks. Increased coastal erosion and damage to coastal buildings and infrastructure. Increased damage to coastal ecosystems such as coral reefs and mangroves.
Intensified droughts and floods associated with El Niño events in many different regions (<i>likely</i>) (see also under droughts and intense precipitation events)	Decreased agricultural and rangeland productivity in drought- and flood-prone regions. Decreased hydro-power potential in drought-prone regions.
Increased Asian summer monsoon precipitation variability (<i>likely</i>)	Increase in flood and drought magnitude and damages in temperate and tropical Asia.
Increased intensity of mid-latitude storms (little agreement between current models) ^b	Increased risks to human life and health. Increased property and infrastructure losses. Increased damage to coastal ecosystems.

^a These impacts can be lessened by appropriate response measures.

^b Information from WGI TAR Technical Summary (Section F.5).

^c Changes in regional distribution of tropical cyclones are possible but have not been established.

Emissions, concentrations and temperature changes corresponding to different stabilisation levels for CO₂ concentrations (IPCC 2001, Summary for policy makers)

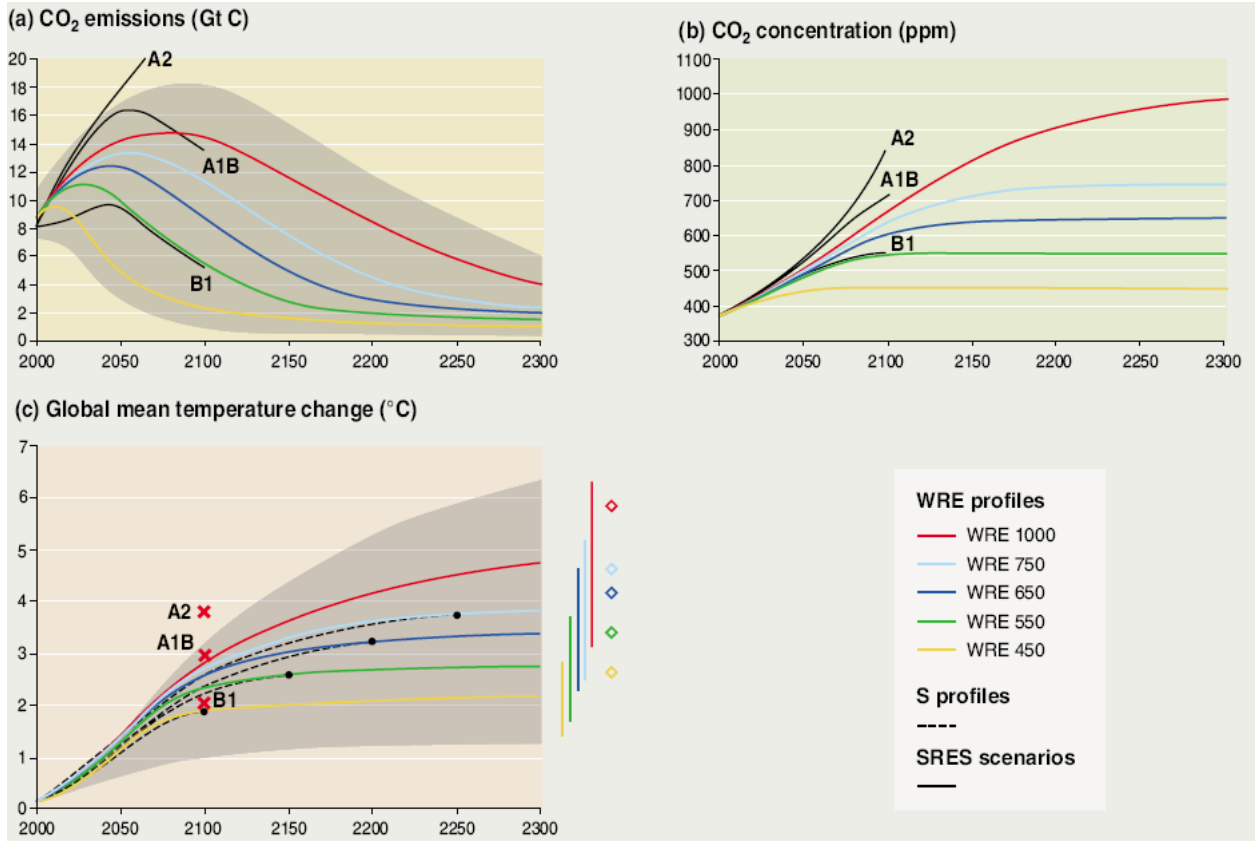


Figure SPM-6: Stabilizing CO₂ concentrations would require substantial reductions of emissions below current levels and would slow the rate of warming.

- CO₂ emissions:* The time paths of CO₂ emissions that would lead to stabilization of the concentration of CO₂ in the atmosphere at various levels are estimated for the WRE stabilization profiles using carbon cycle models. The shaded area illustrates the range of uncertainty.
- CO₂ concentrations:* The CO₂ concentrations specified for the WRE profiles are shown.
- Global mean temperature changes:* Temperature changes are estimated using a simple climate model for the WRE stabilization profiles. Warming continues after the time at which the CO₂ concentration is stabilized (indicated by black spots), but at a much diminished rate. It is assumed that emissions of gases other than CO₂ follow the SRES A1B projection until the year 2100 and are constant thereafter. This scenario was chosen as it is in the middle of the range of SRES scenarios. The dashed lines show the temperature changes projected for the S profiles (not shown in panels (a) or (b)). The shaded area illustrates the effect of a range of climate sensitivity across the five stabilization cases. The colored bars on the righthand side show uncertainty for each stabilization case at the year 2300. The diamonds on the righthand side show the average equilibrium (very long-term) warming for each CO₂ stabilization level. Also shown for comparison are CO₂ emissions, concentrations, and temperature changes for three of the SRES scenarios.

2 SAMPLE 2004 SHAREHOLDER RESOLUTION ON DISCLOSURE OF CLIMATE RISKS

WHEREAS:

In 2001, the Intergovernmental Panel on Climate Change concluded “there is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities.” The National Academy of Sciences stated that the “degree of confidence in the IPCC assessment is higher today than it was 10, or even 5 years ago.”

The Environmental Protection Agency’s “Climate Action Report—2002,” concluded that climate change pose risks to coastal communities due to sea level rise, water shortages, and increases in the heat index and frequency of heat waves.

100+ countries have ratified the Kyoto Protocol, spurring greenhouse gas emission (GHG) controls abroad that could disadvantage U.S. companies against competitors already accustomed to operating in carbon-constrained environments. At least half of U.S. states are addressing global warming, through legislation, lawsuits against the Bush administration or programs initiated by governors.

According to recent polls by Zogby and Gallup, 75% of Americans favor mandatory controls on GHG emissions.

Recent reports by Ceres, the Carbon Disclosure Project, Innovest Strategic Value Advisors, and the Investor Responsibility Research Center demonstrate the growing financial risks of climate change for U.S. corporations, and that companies are not adequately disclosing these risks to investors.

The reinsurer Swiss Re is asking companies applying for directors and officers insurance to explain what they are doing to prepare for potential regulation of GHG emissions.

We believe our industry is highly exposed to risk from climate change; according to the Energy Information Administration, over half of GHG emissions in the United States are from oil and gas combustion.

Industry leaders such as Royal Dutch/Shell, BP, ConocoPhillips, Statoil, Suncor and Amerada Hess are taking actions to reduce their exposure to climate related risks, including assuming a cost for carbon in their strategic planning, reporting on and reducing their GHG emissions, engaging in emissions trading, and investing in renewable energy. BP reports that its emissions reduction activities have generated savings with a NPV of \$650 million.

According to *Oil and Gas Investor*, the industry’s environmental record is hurting its ability to attract strong employees. Companies like BP claim that their proactive stance on climate change helps to recruit and retain quality employees.

RESOLVED:

The shareholders request that a committee of independent directors of the Board assess how the company is responding to rising regulatory, competitive, and public pressure to significantly reduce carbon dioxide and other greenhouse gas emissions and report to shareholders (at reasonable cost and omitting proprietary information) by September 1, 2004.

SUPPORTING STATEMENT:

We believe management has a fiduciary duty to carefully assess and disclose to shareholders all pertinent information on its response associated with climate change. We believe taking early action to reduce emissions and prepare for standards could provide competitive advantages, and inaction and opposition to emissions control efforts could expose companies to regulatory and litigation risk, and reputation damage.

Source: CERES (2004) This resolution was filed with seven U.S. oil companies in 2004. A similar resolution was filed with six U.S. electric utilities. CERES and the Interfaith Centre on Corporate Responsibility helped draft this proposal and coordinated filings by public pension plans, social investing firms and faith-based groups.)