WWF

REPORT

UK

2010

WORKING TOGETHER FOR A LOW CARBON ECONOMY

The co-operative bank insurance investments

Toxic fuels: toxic investments

Why we need mandatory greenhouse gas reporting

Toxic Fuels campaign - *WWF-UK and The Co-operative Bank, Insurance and Investments are campaigning in partnership against the alarming global trend of developing carbon-intensive unconventional fossil fuels such as tar sands and shale oil, which risk the 'locking in' of a high-carbon economy for decades to come and threaten climate disaster.*

Front cover: Aerial view of a tailings pond north of Fort McMurray, Alberta, Canada. The Alberta Tar Sands are the largest deposits of their kind in the world and their production is the single largest contributor to Canada's greenhouse gas emissions. © Jiri Rezac / WWF-UK

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EXECUTIVE SUMMARY

Oil and gas companies base their strategies around investing in fuel reserves, production and refining facilities for the future. Emitting carbon dioxide (CO_2) will become more and more expensive in the future, as regulation of greenhouse gas (GHG) emissions is progressively tightened up. That means the decisions that these companies – and their investors – take now will lock them into potentially expensive future carbon liabilities for decades. Yet oil and gas companies are not disclosing to investors the potentially huge costs they will have to pay in order to continue emitting massive amounts of CO_2 and other GHGs in the future.

It is a truism in business that you cannot manage what you do not measure. The failure of companies to measure and disclose their exposure to future carbon costs obscures the risk associated with high-carbon investments, and contributes to a misallocation of resources. It makes sense for businesses which aspire to lead the shift to a low carbon economy to be proactive in improving reporting practices and demonstrating the savings they will make and the value they will create.

Toxic fuels: tar sands

Tar sands – a complex mixture of bitumen, sand, clay and water that are currently being exploited to produce synthetic crude oil – epitomise the kind of highly carbon- and capital-intensive investments whose true value and risk are obscured by the failure to account for future carbon costs.

The Canadian tar sands are also a destination of choice for UK-based companies like BP and Shell, as well as UK investors.

Tar sands are a globally-significant source of potential future carbon emissions. Through its tar sands, Canada is promoting itself as a new energy superpower. It has proved reserves of 174 billion barrels of oil, second only to Saudi Arabia. If technology currently in development is successful, accessible reserves could total 315 billion barrels.

Extracting oil from tar sands is a hugely expensive, energy-intensive and destructive process. Production of synthetic crude oil from tar sands emits about three times as much GHG (CO_2-e) per barrel as conventional oil.[1]

Current production stands at 1.3 million barrels per day, with estimates of future production ranging from 2.5 to 6.2 million barrels per day by 2020. It has been reported that operators have proposed more than C$125 billion worth of projects by 2015, and recent estimates from the Canadian Energy Research Institute suggest that as much as US$379 billion of investment is required by 2025.[2] From extraction through to final use, exploitation of Canada's probable reserves could generate emissions of 183 $GtCO_2$, equating to an increase in atmospheric CO_2-e of up to 12 parts per million.[3] This represents a major threat to global efforts to reduce emissions and fight climate change.

It is also noteworthy that the significant expansion plans for tar sands are not compatible with the International Energy Agency (IEA) '450ppm stabilisation scenario' for the future development of global energy markets, which sees fossil fuel consumption and its associated GHG emissions peaking by 2020. The expansion is only compatible with the IEA's business as usual 'reference scenario', which would lead to 1000ppm of atmospheric CO_2-e, the effects of which to quote the IEA would *"almost certainly lead to massive climatic change and irreparable damage to the planet"*.[4]

Tar sands expansion represents an unacceptable threat to the local environment and global climate, and could also be a bad financial investment. Companies with big tar sands investments risk future losses by focusing on a business area that is only profitable if emitting carbon is cheap (or carbon capture and storage is very efficient), oil prices are stable at a high level, and there is a large market for the oil produced. All of these conditions are subject to serious doubts, and are key economic factors that make tar sands a risky investment.

The 2009 Trucost report, Carbon Risks in UK Equity Funds, analysed £206 billion in assets under management in the 118 UK pension fund equity portfolios. Based on the current emissions of the companies the funds invested in, the annual cost of carbon attributable to those assets could rise to £7.5 billion if emissions regulation continues to tighten.

Carbon costs, risks and liabilities

The carbon footprint and exposure to future carbon cost of some investment portfolios are extremely high. The 2009 Trucost report, *Carbon Risks in UK Equity Funds*, analysed £206 billion in assets under management in the 118 UK pension fund equity portfolios. Based on the current emissions of the companies the funds invested in, the annual cost of carbon attributable to those assets could rise to £7.5 billion at a carbon price of £57 if emissions regulation continues to tighten. The utilities and oil and gas sectors produced almost half the GHG emissions of the holdings analysed, illustrating that these sectors are subject to a particularly high risk of rising carbon cost.

But companies are not transparent about these future costs, and pension fund providers cannot assume that their fund managers are actively managing carbon risk. Indeed, interviews by Mercer found that fund managers are not yet active in doing this. One reason investor behaviour is not changing is that the companies they invest in are not disclosing associated risks in their financial bottom line.

Carbon liabilities of UK companies*

If oil companies had to pay for all their direct carbon emissions from operations and energy use they could suffer huge loss of earnings. WWF has estimated the annual costs, impact on earnings, and potential future carbon liabilities that would result for a range of companies.

BP's carbon liabilities, at a carbon price of £12 per tonne, could be £7 billion for their proved reserves at a carbon price of £75 per tonne these liabilities would rise to £42 billion (See Appendix for details of carbon price scenarios)

Shell's carbon liabilities could total £6 billion for proved reserves (including minable tar sands) at a £12 carbon price. At £75, Shell's carbon liabilities could total £36 billion for proved reserves, which do not include its very large in-situ tar sands reserves.

** Carbon liability is a projected measure of the full cost the company would pay if it were charged for all of its GHG emissions now and in the future. For oil and gas sector companies, this has been calculated by multiplying total direct production emissions (excluding combustion of fuel in use) from exploitation of all their reserves by the price of carbon in a range of scenarios.*

Tar sands, are a complex mixture of bitumen, oil, sand, water and clay. Extracting oil from tar sands is one of the dirtiest and most carbon-intensive forms of energy production.

Tar sands shareholder resolutions

In January 2010, a coalition of investors and NGOs, coordinated by FairPensions and The Co-operative Asset Management, successfully filed shareholder resolutions to the annual general meetings (AGMs) of BP and Shell. The resolutions called for each company to disclose key information on issues such as GHG emissions and answer questions about the risks associated with their involvement in tar sands.

Over 140 investors co-filed the resolutions, and an unprecedented coalition of investors, unions, environmental organisations and faith groups actively campaigned to mobilise pension fund support for them.

The resolution process and public interest triggered a level of disclosure that was previously absent. The companies were forced to break their silence on the details of their tar sands projects and plans. Whilst the levels of disclosure were not complete or satisfactory, they were improved. In the City of London the issue of tar sands went from being largely invisible to being a hot topic of debate.

The resolutions attracted significant support, including from some of the world's largest pension funds. The BP AGM, on 15 April, saw one in seven investors oppose the management (6% supported the resolution and 9% abstained, which is considered to be a vote against the management). The Shell AGM, on 15 May, resulted in over 10% of investors opposing the management. These were significant results, particularly for resolutions based on environmental and social risks.

This disclosure should not be considered a one-off process. For oil companies, it should form a base from which to build increasingly robust and comprehensive reporting mechanisms on issues such as GHG emissions and associated risks.

UK finance and pensions

The UK is a global centre for fossil fuel finance. Some 12-15% of total global CO2 emissions are associated with the products and services of companies listed in the UK. Investors are continuing to back projects that could be regarded in the future as 'sub-prime' toxic assets. That represents a huge threat to savings, pensions and investments, while diverting finance away from low-carbon businesses that should be the future of a green economy.

For example, UK workplace pension funds owned approximately 14% of the FTSE all-share index in 2008. WWF estimates that £35.5 billion of pension assets are invested in oil and gas, and another £9 billion in utilities. Investors and pension holders have already found to their cost in 2010 how poorly-managed environmental risks can have massive financial consequences, with BP's share price falling by almost 50% and dividend payments cancelled as a result of huge costs likely to be incurred from the Gulf of Mexico deepwater oil spill.

LONG-TERM CARBON LIABILITES

Mandatory carbon emissions reporting and reporting of financial carbon liabilities is necessary to make these costs and risks transparent and to help shift investment to low-carbon alternatives.

Policy recommendations

Government

WWF and The Co-operative Bank, Insurance and Investments are calling on the Government to:

- Introduce mandatory reporting of corporate GHG emissions as soon as possible, and before the 2012 deadline set in the Climate Change Act 2008.
- Provide clear guidance on the reporting of indirect emissions (Scope 3), particularly for businesses in sectors like oil and gas that generate very high indirect emissions when their products are used.
- Build on mandatory carbon disclosure and take measures to further increase transparency and the information available to investors on future carbon emissions and associated costs, risks and opportunities. Specifically, UK-listed companies in the oil and gas and power generation sectors should be required to report their long-term carbon liabilities.
- At the EU level, introduce robust carbon disclosure requirements for all transport fuel feedstocks entering the EU market as part of the Fuel Quality Directive.

Companies

WWF and The Co-operative Bank, Insurance and Investments are calling on companies to:

- Disclose in detail to investors the way in which climate change factors like carbon emissions and carbon costs are expected to affect financial performance. These should consider a range of plausible regulatory and economic scenarios, including scenarios that incorporate the low levels of emissions, high price of carbon, and shift away from fossil fuels necessary to limit atmospheric CO2 at or below the level required to avoid dangerous climate change.
- The disclosures and dialogue undertaken by BP, Shell and other oil companies in response to the 2010 shareholder resolutions on tar sands should be the first step towards providing full disclosure of such environmental, social and financial risks to investors.

Investors and pension funds

WWF and The Co-operative Bank, Insurance and Investments are calling on investors and pension funds to:

- Engage with companies to encourage them to report emissions fully, to disclose forward-looking information about carbon costs and other risks associated with climate change, and to explain their emissions reduction strategy.
- Support government action to require mandatory reporting of GHG emissions by businesses, and reporting of carbon liabilities by listed companies in the oil and gas and power sectors.
- Press for comprehensive disclosure and dialogue on material environmental, social and governance risks.
- Monitor portfolio GHG emissions and exposure to carbon costs, and develop processes to manage these effectively, to protect beneficiaries' long-term investments.
- Build on the successes of the shareholder resolutions on tar sands risk disclosure at the 2010 AGMs of Shell and BP, undertaking ongoing scrutiny and analysis of the financial risks associated with unconventional and other risky oil projects.
- Proactively seek opportunities to invest in low-carbon sectors and companies developing low carbon products and services, which can be expected to deliver long-term returns on investment in a future low-carbon global economy.

INTRODUCTION

Through their financing of oil and gas companies, UK pensions and investments are having a major climate impact that could and should be reduced. Toxic investments in high-carbon businesses like tar sands represent a big financial risk to individual people (through their investments and pensions), UK financial markets and companies. Mandatory carbon emissions reporting and reporting of financial carbon liabilities is necessary to make these costs and risks transparent and to help shift investment to low-carbon alternatives.

Toxic investments in high-carbon businesses like tar sands represent a big financial risk to individual people (through their investments and pensions), UK financial markets and companies.

Carbon reporting and low-carbon investment

As awareness about the role of greenhouse gases (GHGs) in causing man-made climate change has grown, and understanding of the enormous impacts climate change will have on our lives has improved, governments are acting to regulate and reduce emissions. By 2050, global GHG emissions need to be cut by at least 80% from 1990 levels in order to have a reasonable chance of keeping the increase in average global temperature to less than 2°C.

. WWF and Ecofys have calculated a global carbon budget – the maximum total emissions between 1990 and 2100 that are consistent with a 2°C limit. This carbon budget is 1,600 GtCO2-e.[5] Unfortunately, mankind has increased its global emissions since 1990, which means the remaining carbon budget for the next 90 years is 870 GtCO2-e. This would require global average annual emissions of 9.5 GtCO2-e, which is about 20% of today's level. Even with carbon capture and storage for power generation, most known fossil fuels must stay in the ground to meet this budget.

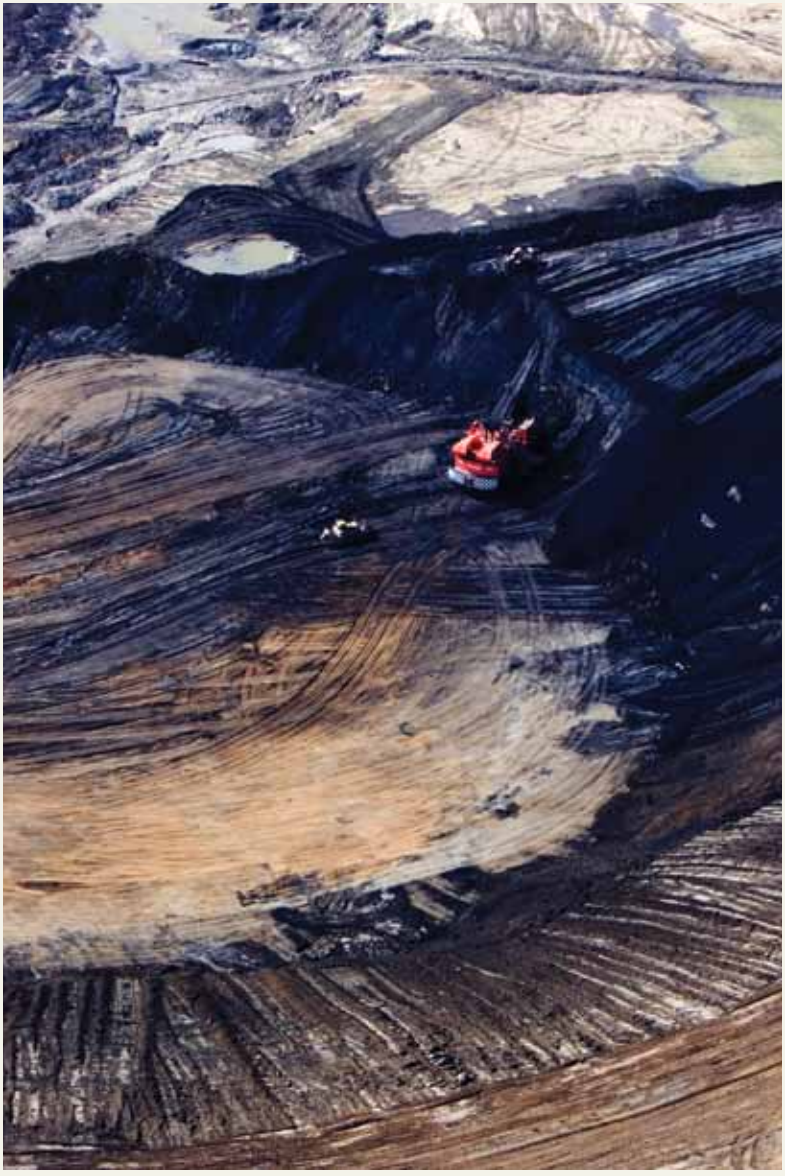
If emissions are not reduced enough, the *Stern Review on the Economics of Climate Change* (2006) estimates that climate change could cut global GDP by up to 20%. The EU has an existing target to cut emissions by 20% from 1990 levels by 2020. In order to stimulate the degree of low-carbon investment needed in Europe and restore EU's leading role in tackling climate change, this must be raised to 30% or more as soon as possible. Indeed, in May 2010 the European Commission published a communication showing that a reduction target of 30% by 2020 will be beneficial to the European economy, saving billions of Euros in health costs and tens of billions in avoided fossil fuel imports.[6] The EU Emission Trading Scheme (EU ETS) is already in place to help drive emissions reductions.

It is the world's first compulsory trading scheme for multi-sector corporate emissions. The ETS has had many problems and has not delivered on its potential for emissions reduction in its early phases. But it is being strengthened, with the prospect of tighter caps, and companies having to purchase a larger proportion of allowances from 2013. An improved ETS needs to work with a range of other policy and regulatory measures to drive rapid decarbonisation of Europe's economy.

A number of other countries have legislation under consideration to bring in similar schemes. In the US, the Obama administration aims to pass a US Climate Change Bill in 2010. The draft bill proposed emissions reduction targets of 17% below 2005 levels by 2020 and 80% below 2005 levels by 2050.[7] It is also expected to include a cap-and-trade scheme for power companies and a tax on refined oil products.[8]

Some 150 institutional investors who collectively manage more than US$9 trillion of assets put their voice behind the urgent need for a strong global deal on climate change, in a public statement prior to the UN climate change summit in Copenhagen, in December 2010.[9] ClimateWise – a global coalition of insurers that are concerned about climate change – also issued its own statement, expressing concern about systemic risk to the global economy, and stating that Copenhagen must bring the adoption of tough new emissions reduction targets, including a 40% reduction by 2020 below 1990 levels for developed countries.[10]

In the aftermath of a summit that did not fully meet the expectations of many climate campaigners, politicians or investors, a new statement was issued urging policymakers to act swiftly to provide strong signals that will accelerate private investment in a low-carbon economy:



Every barrel of oil extracted from the tar sands results in, on average, four barrels of polluted water and the release of three times the carbon emissions when compared to a barrel of conventional oil.

'On the global level, it is imperative that efforts advance this year to negotiate and conclude a legally binding agreement with ambitious greenhouse gas emission reduction targets.

'But investors, businesses, and governments cannot wait for a global treaty before taking action. Countries must take steps now if they are to attract the sizable amount of private investment needed to be competitive in the global race to develop and transition to low-carbon technologies.'
(IIGCC, Investor Network on Climate Risk, Investor Group on Climate Change, UNEP-FI, 2010)

As the UK Committee on Climate Change stated in its recent report, *Meeting Carbon Budgets – the need for a step change*, market-based approaches are unlikely to be sufficient to deliver the necessary reductions on their own.[11] A range of other policies including carbon taxes on fuels, emissions performance standards for power generation, fuels and vehicles, as well as direct support for renewable energy generation and uptake will all play a strong role.

+24%

LOW-CARBON RESOURCES AND INDUSTRIES NEED TO GROW AT A RATE OF 24% PER YEAR

The Climate Solutions 2 report, commissioned by WWF, has shown that low-carbon resources and industries need to grow at a rate of 24% per year, starting in 2010, in order to achieve emissions cuts of 80% relative to 1990 levels by 2050.[12] This growth rate is possible but is near the limit of what can be sustained. This means that huge investment in low-carbon industries needs to begin immediately. This needs to be complemented by a strategic move away from investing in high-carbon, business as usual activities.

Action cannot be delayed, as a slow start would leave a growth gap that is near impossible to catch up. The strongest possible measures must be put in place to enable investors to finance this shift quickly and at a huge scale. This includes making transparent the costs of continuing to invest in carbon-intensive business, and also demonstrating the large long-term returns that will be available from renewable energy savings. Transforming the energy sector in this way could see renewable energy technologies start to outperform the existing fossil fuel business-as-usual model from 2013. The savings generated are expected to exceed US$47 trillion between 2013 and 2050, for the 80% emissions reduction scenario.[13]

The clear momentum for increased regulation of carbon means carbon costs for companies are likely to rise significantly in future, whether directly through carbon markets and taxes, or through impacts on the cost structure of their supply chains. Responding to these accelerating regulatory trends, many big companies now report their annual carbon emissions, and some publish emissions reduction targets.

Oil and gas companies base their business models around investing in fuel reserves and facilities for future production and refining. They make huge capital investments now on the understanding that these will pay off for years and decades to come. But such investments also lock them into producing CO2, directly and indirectly, for many years. Meanwhile, emitting CO2 is becoming more and more expensive, as regulation of GHG emissions is tightened up. That means the decisions these companies, and their investors, take now are building up potentially huge future carbon liabilities – the amount they will pay for the CO2 emissions from their business activities in future. Yet, hardly any of these companies are disclosing clear and detailed information to investors about their expected future emissions or their carbon liabilities.

The UK government has recently published voluntary guidance on how companies should measure and report their GHG emissions. The Climate Change Act 2008 requires the government to make this reporting mandatory by 2012 or explain why it has not done so. Mandatory reporting is a vital tool for companies to manage and reduce emissions, and for investors to have comprehensive, reliable and comparable information on how companies are doing this. It makes sense for businesses which aspire to lead the shift to a low carbon economy to be proactive in improving reporting practices and demonstrating the savings they will make and the value they will create.

The extreme urgency of the need to reduce emissions and prevent dangerous levels of climate change means that the Government must act immediately to make emissions reporting mandatory, and require additional reporting on financial costs and risks associated with GHG emissions from listed companies in the key sectors like oil and gas and power.

This is an important step among the many actions required for the UK to successfully make the transition to a low carbon and resource efficient economy. There are huge opportunities open to those who will lead this transition in this country and globally. UK businesses and investors can seize those opportunities if the UK transition is rapid and decisive, especially in key sectors like renewable energy, energy efficiency and transport.

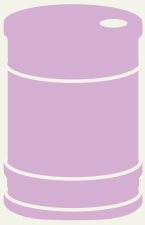
Box 1. Mandatory carbon disclosure

WWF and The Co-operative Bank, Insurance and Investments are calling on the government and opposition parties to:

- Introduce mandatory reporting of corporate greenhouse gas emissions as soon as possible, and before the 2012 deadline set in the Climate Change Act 2008.
- Provide clear guidance on the reporting of indirect emissions (Scope 3), particularly for businesses in sectors like oil and gas that generate very high indirect emissions when their products are used.[14]
- Build on mandatory carbon disclosure and take measures to further increase transparency and the information available to investors on future carbon emissions and associated costs, risks and opportunities; specifically by requiring UK-listed companies in the oil, gas and power generation sectors to report their long-term carbon liabilities.

TOXIC FUELS: CANADIAN TAR SANDS

WWF-UK and The Co-operative Bank, Insurance and Investments are campaigning against the continued expansion of operations to exploit the Canadian tar sands – enormous reserves of sand and clay drenched with bitumen and water, which can be used to produce oil. Thanks to its tar sands, Canada is promoting itself as a new energy superpower. It has proved reserves of 173 billion barrels of oil, putting it second only to Saudi Arabia. Canada also has estimates for bitumen in place between 1.7 and 2.5 trillion barrels. If technology currently in development is successful, accessible reserves in Canada could total 315 billion barrels.



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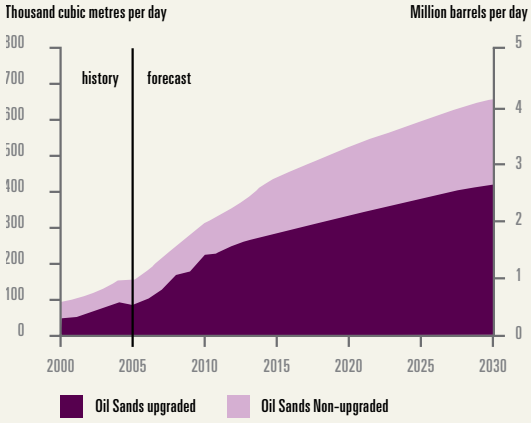
Current production stands at 1.3 million barrels per day (bpd), with estimates of future production ranging from 2.5 to 6.2 million bpd by 2020. It has been reported that operators have proposed more than C$125 billion worth of projects by 2015, and recent estimates from the Canadian Energy Research Institute suggest that as much as US$379 billion of investment is required by 2025.[15] Although investment and development slowed down during the recent credit crunch and recession, this is very much a temporary situation, with companies expected step up the pace of development as economic conditions improve. There are signs that this is happening already.

Canadian Oil Sands Production – Continuing Trends



Canada's Energy Future: Reference Case and Scenarios to 2030, National Energy Board, Canada, November 2007 (revised).

Extracting oil from tar sands is a hugely expensive, energy-intensive and destructive process. Canada contains half the world's boreal forest and 11% of global terrestrial carbon sinks. Tar sands operations are causing significant deforestation and damage to peatland and wetlands. They are eroding the carbon storage value of these areas, which are vital for preventing climate change.[16] Huge amounts of water from the Athabasca River are being used, and operations are producing enormous tailing ponds. So far these ponds cover an area of 130 sq km. They are filled with toxic wastewater that is poisonous to wildlife. The traditions and health of Canadian First Nations indigenous communities are threatened as concerns rise about the level of toxins in water and fish, and the unusual incidences of cancer reported in some communities.[17]

Production of oil from tar sands emits about three times as much carbon per barrel as conventional oil from the well to the refinery.

Production of oil from tar sands emits about three times as much carbon per barrel as conventional oil from the well to the refinery.[18] Even when measuring the full lifecycle carbon emissions from well to wheels (including fuel combustion in use) oil from tar sands emits between 14% and 40% more GHGs.[19] Oil industry reports favour the use of data sources that provide a figure for tar sands as 5% to 15% more carbon intense than the average conventional oil used in the US.[20] However, this data is based on an industry-sponsored and non-peer reviewed report. Significant concerns have been raised about the selection of data sources, quality of documentation and large differences in results relative to other studies.[21]

Canada is already way off track for the emissions reductions needed to meet its Kyoto Protocol commitments. Total GHG emissions in Canada in 2007 were 27% above 1990 levels – 34% above Canada's Kyoto target to reduce emissions to 6% below 1990 levels on average during the period 2008-2012.

From extraction to its final use, exploitation of Canada's probable tar sands reserves of 315 billion barrels of oil could generate CO2 emissions of 183 GtCO2, equating to an increase in atmospheric CO2 up to 12 parts per million (ppm).[22] The actual level of emissions produced will depend on the rate and method of extraction and also on the degree of improvements in technological efficiency and mitigation in the future. Even so, this industry represents a significant threat to global efforts to reduce emissions and fight climate change. If we think of this in terms of the global

This industry represents a significant threat to global efforts to reduce emissions and fight climate change. If we think of this in terms of the global carbon budget described earlier in this report, total emissions from exploiting Canadian tar sands would equate to 21% of total allowable emissions until 2100 – or over 19 years' worth of the world's carbon budget.

carbon budget described earlier in this report, total emissions from exploiting Canadian tar sands would equate to 21% of total allowable emissions until 2100 – or over 19 years' worth of the world's carbon budget. We simply cannot afford to squander our budget in such a wasteful and damaging way by expanding the most carbon-intensive industries when governments and private investors should be seeking investment opportunities in low-carbon alternatives.

Tar sands expansion represents an unacceptable threat to the local environment and global climate, as well as a bad financial investment.

Tar sands economics

Companies with big tar sands investments risk big future losses by focusing on a business area that is only profitable if emitting carbon is cheap (or carbon capture and storage is very efficient), oil prices are stable at a high level, and there is a large market for the oil produced. All of these conditions are subject to serious doubts, and form a key part of the economic factors that make tar sands a risky investment:

- Carbon prices are expected to rise and caps on emissions are being introduced in more and more countries, with an increasing number of companies facing the prospect having to buy more allowances at higher prices.
- Even excluding rising carbon costs, producing oil from the most accessible tar sands is only profitable with an oil price above US$75 per barrel.[23] Higher prices still are required for other tar sands reserves that are harder to extract and process. Analysts have calculated that profitability depends on a sustained oil price in the range from US$70-$100 per barrel.[24]
- Oil prices have fluctuated wildly in the past few years, and volatility is likely to be here to stay as a structural feature of global oil markets. In other words, there is a significant chance that oil prices and demand will never remain stable at high enough levels for tar sands to deliver sustainable profits.[25]
- Production costs fell during the recent recession, allowing oil companies to make bigger profits. However, forecasts for future profitability based on the current cost environment are likely to prove over-optimistic as costs are already beginning to rise again and will continue to do so.

- Low-carbon fuel standards, like the one already in place in California and those being introduced in British Columbia and Ontario in Canada, could decimate the market for dirty fuels like oil from tar sands. They will make it much more expensive to buy fuel that has very high GHG emissions in its production, potentially slashing demand by making oil from tar sands a very expensive alternative to cleaner options. A strong EU Fuel Quality Directive, currently under consideration in Brussels, would make it harder for producers to sell fuel from tar sands to the important EU market.

'The end is nigh for the Age of Oil'[26]

A recent report from Deutsche Bank analyses the dynamics of what it calls 'the end of the oil age'. It predicts that oil supply will peak in the next six years. It also predicts that a combination of the impact of hybrid and electric vehicles and improved vehicle fuel efficiency, and a switch to cheaper and readily available natural gas will mean that oil demand will also peak in the next six years. OPEC countries will be forced to cut prices to compete and this will further exacerbate chronic underinvestment in the development of new supply. Oil prices will be characterised by medium-term volatility and long-term decline.

This forecast has serious consequences for companies like Shell and BP. Shell will be particularly at risk because expensive-to-produce heavy and unconventional oils like tar sands, which require massive capital investment, will be worth much less than the market currently expects. Many investors are currently optimistic about oil, including these 'marginal' sources, but this optimism is based partly on an unrealistic expectation of demand growth. Demand for gasoline in the US, by far the biggest market for tar sands, is forecast to drop 46% from its 2009 level by 2030.[27]

"There is simply no firm understanding of what kind of playing field and end demand environment we will be facing in major consumer countries. Again, the safest investment is lower carbon natural gas, the least safe, clearly Canadian heavy oil sands and other high capex, carbon-intense, oil recovery processes. It is these projects that are both at the margin of profitability at current prices, on a full cycle basis, and most needed if we are to continue to grow the oil market. Our simple conclusion is that we will not grow the oil market." (Deutsche Bank, 2009)[28]

BP, which is already reeling due to the terrible consequences of the Gulf of Mexico oil spill from the Deepwater Horizon rig, will also be at risk because it is expanding into tar sands production and is also investing money to develop its US refining capacity for unconventional and heavy oil. The Deutsche Bank reportdescribes refining as 'a twilight business', which will face increasing difficulties due to falling demand for gasoline. There is an over-supply of refining capacity that has already cut into oil industry profits since the global recession started. Falling demand for oil-based transport fuels, combined with increased refining capacity close to the big oil fields of the Middle East and Asia, means refining in the US and Europe is likely to experience ongoing problems.

On BBC Radio 4's *Today* programme, on 4 February 2010, BP's CEO Tony Hayward clearly stated that the market for gasoline has peaked and that this will bring serious problems for the oil industry:

"The industry will not sell more gasoline in either the US or Europe than it did in 2007. Ever. As government regulation and policy drives efficiency into the transport fleet [...] it's a challenge for companies like BP. It's why our refining and marketing businesses are so challenged right now, because there is a lot of surplus capacity that is not going to go away."

It is becoming clear that all energy companies have to think very seriously about the implications of a world where electricity rather than the internal combustion engine powers a large proportion of vehicles, and all energy production whether in power stations, wind farms, or car engines has to cope with emissions controls that are tough and will get progressively tougher.

"... the policy pressures of increasing price volatility, decreasing supply security, and the growing impact of the climate change agenda raise important strategic issues for every player in the energy business. Oil and gas companies, for example, may need to give renewed thought to the sustainability of their business models... "[29]

+85%

THE AVERAGE CARBON INTENSITY OF SHELL'S OIL AND GAS PRODUCTION IS PROJECTED TO RISE BY 85% FROM TODAY'S LEVELS, AND AS A RESULT THEY ARE VERY VULNERABLE TO RISKS FROM RISING CARBON PRICES

UK oil companies: Shell and BP

Shell is among the global oil companies investing heavily in expanding Canadian tar sands operations and increasing the proportion of its production that comes from this dirtiest of fossil fuel sources. Fully 30% of its total resources are made up of tar sands, and they will form a big part of Shell's future production.[30] As a result the average carbon intensity of Shell's oil and gas production is could rise by as much as 85% from today's levels, and as a result they are very vulnerable to risks from rising carbon prices.[31] This high vulnerability relative to other companies in the oil and gas sector has already been noted in an investment report by HSBC in 2008.[32]

BP has until recently had only one major planned upstream investment in tar sands – a US$10 billion joint venture with Husky Oil to develop the Sunrise SAGD (steam-assisted gravity drainage) project to extract in-situ tar sands. A decision on the final approval for this project is due in 2010. The first phase of Sunrise will have a production capacity of 60,000 bpd.[33]

BP is also becoming reliant on expansion of tar sands exploitation because it has been developing and reconfiguring its refining capacity in the US to deal with larger amounts of synthetic crude oil from the tar sands.[34] BP is spending US$2.5 billion developing its refinery in Toledo, Ohio, so that it can process the synthetic crude oil produced from tar sands at the Sunrise facility.

Shell has stood out in the past as the UK oil company with far and away the greatest enthusiasm for tar sands development. However, in the recent months BP has made it clear that it intends to increase its involvement in tar sands. Not only has it reiterated its intention to develop Sunrise and Toledo, it has also stated that it will consider developing a tar sands project at Kirby, and in March 2010 BP acquired from Value Creation Inc a 75% interest in the Terre de Grace tar sands lease, in Alberta, Canada, which will also now be considered for development.[35] All of these are in-situ projects and would use SAGD technology.

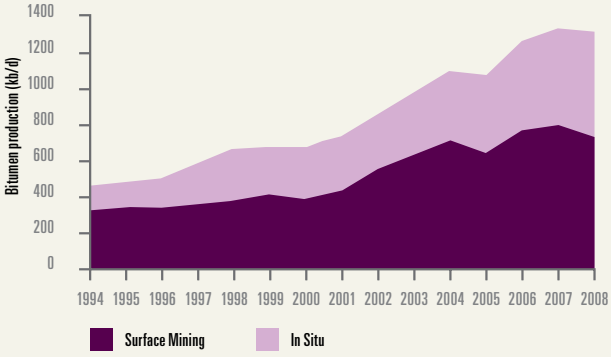
Exploiting Canadian tar sands is a hugely capital-intensive business. Shell invested US$1.9 billion in tar sands in 2007 and US$3.1 billion in 2008, and received revenues of US$582 million and US$941 million respectively for those years.[36]

It has been estimated that US$379 billion will be invested in expanding tar sands operations in Alberta between now and 2025. This is risky from a climate change and investor perspective – diverting valuable investment away from the key global challenge of shifting to a low-carbon economy.

The expansion of Shell's US$14 billion Athabasca Oil Sands Project is nearly complete, raising its capacity to 255,000 bpd. It is not unusual for energy sector projects to have very large development costs in their early stages and take a long time to show profits, but oil production from tar sands is an exceptionally expensive business and may not produce sustainable profits. Such huge capital investment costs only increase the likelihood that, if the expansion of operations is not stopped, oil companies will keep on going to almost any lengths to make a return on their investment, even if the ultimate cost to the planet and investors is very high.

In January 2010, Shell announced that it was slowing down the development of its massive 20 billion barrels of tar sands resources. It says that current market conditions dictate a switch of emphasis to more favourable areas of its business. It should be kept in mind, however, that this is in no way a commitment not to exploit those remaining resources. Shell's intention remains to develop them in the future, as and when market conditions dictate. It has not been made clear what circumstances would trigger a slowing down or speeding up of expansion plans, but it is clear that Shell will have no hesitation in resuming expansion when it sees fit.

Figure 1: Tar sands production (Bitumen), 1994-2008



Canada's Oil Sands Industry – Production and Supply Outlook, Strategy West, August 2009

CCS is not capable of mitigating the high emissions resulting from tar sands operations.

Emissions reduction and carbon capture and storage (CCS)

Companies involved in tar sands exploitation have often claimed that the development of CCS technologies will reduce emissions sufficiently to bring tar sands into line with conventional oils in terms of production emissions. They claim that this will mitigate GHG emissions and reduce their future carbon costs. But they provide little evidence for such claims. In recent years, the Canadian government has echoed some of this optimism – anxious to market tar sands as an investment opportunity, a source of energy security for Canada and the US, and a source of jobs and income. The Canada-Alberta Carbon Capture and Storage Task Force has been trumpeting the prospects for CCS as the key to securing Canada's 'Fossil Energy Future', and advocating increased public funding to establish and scale up CCS projects.

Evidence shows that opportunities to capture carbon emissions from tar sands operations are limited and very expensive, especially when compared to larger, highly concentrated sources, such as coal-fired power stations.

Recent research from WWF and The Co-operative Bank, Insurance and Investments has shown that CCS is not capable of mitigating the high emissions resulting from tar sands operations as some industry and government figures have claimed. The evidence shows that opportunities to capture carbon emissions from tar sands operations are limited and very expensive, especially when compared to larger, highly concentrated sources, such as coal-fired power stations. Even the most optimistic estimates from industry experts claim reductions from oil sands upstream operations will only be in the 10-30% range by 2020 (and then only for the more favourable sites) and between 30% and 50% by 2050. Reductions of around 85% are required to make oil sands emissions comparable with the average for conventional oil production.[37] Furthermore, the technology in development is untested on a commercial scale, and it has been estimated that subsidies of C$1-3 billion per year would be required to successfully promote CCS projects in Alberta.[38]

Given the costs involved and the uncertain effectiveness of CCS technology when applied to tar sands production and upgrading, this could well mean pouring good money after bad on a solution that will deliver too little, too late. This would divert billions of dollars more away from more viable applications of CCS, and from other vital clean and renewable energy technologies and energy-efficiency programmes.

The Canadian government has announced that it will give Shell C$865 million towards its Quest CCS project, raising concerns that vital investment is already being directed to CCS for tar sands rather than to supporting projects that have better potential to produce positive climate outcomes and stimulate economic growth.

CARBON COSTS, RISKS AND LIABILITIES

Our planet's climate is already changing, and the latest research shows that some change may happen more quickly than scientists had previously anticipated if we continue on a high emissions pathway.[39] But many of the most severe impacts of climate change will be felt in the future, some of them many decades ahead, even though the magnitude of their severity will be determined to a large extent by the actions we take now. Much of the public policy response to climate change is aimed at bringing awareness of those future impacts into the present, and regulating in ways that mean our individual and collective decisions in the next few years already take them fully into account. This is one of the reasons for establishing carbon markets, and it is something that must be incorporated into companies' plans and investors' decisions as soon as possible.

Bringing future costs into the short-term horizons of most investors will establish the longer-term perspective that can enable investors to make decisions now that will support the successful low-carbon companies of the future.

Cap and trade carbon market schemes can provide one important element of the framework of controls and incentives to send the right signals to the market place about what will be valued in a low-carbon economy. Those price signals are not yet nearly strong enough and will only work effectively as part of a strong framework of emissions regulation mechanisms and investment incentives. However, carbon prices could be used to increase the ability of investors to assess the future profitability of companies, as well as their more immediate costs. Bringing future costs into the short-term horizons of most investors will establish the longer-term perspective that can enable investors to make decisions now that will support the successful low-carbon companies of the future.

The failure to reach a binding global deal on climate change at the UN summit in Copenhagen at the end of 2009 has had a negative impact on carbon prices in the short term, and has temporarily denied global investors some of the strong signals that they need to manage carbon risk now. Nevertheless, the Copenhagen Accord does provide a stepping stone towards a fair, ambitious and binding deal. It remains clear that governments the world over consider climate change mitigation and adaptation to be a key policy objective, and that the momentum to bring about change is powerful. Increasingly tough emissions regulation and increasingly high costs for carbon emissions are still the most likely future outcome.

As governments and businesses learn more about the increased efficiencies, new markets and competitive advantages available to those leading the way in low-carbon industries, the opportunities for investors to generate returns outside of traditional industries like fossil fuels are expanding.

In many respects, economies are shifting towards decarbonisation already. As governments and businesses learn more about the increased efficiencies, new markets and competitive advantages available to those leading the way in low-carbon industries, the opportunities for investors to generate returns outside of traditional industries like fossil fuels are expanding.

In the UK, the new coalition government is set to establish a Green Investment Bank to leverage massive private investment in the energy-efficiency and renewable energy projects that are required to decarbonise the UK economy.

The carbon footprint and exposure to future carbon cost of some investment portfolios is very large, as a recent report commissioned by WWF has shown.[40] The report – *Carbon Risks in UK Equity Funds* – analysed £206 billion in assets under management in 118 UK pension fund equity portfolios.

Based on current emissions, if the investee companies paid £12 per tonne for all their carbon emissions, this would equate to an annual cost of £1.6 billion for the proportion of equity held by the funds analysed. However, it is widely predicted that the cost of carbon will increase substantially as regulation tightens and cap and trade systems are squeezed. At a price of £57 per tonne, carbon costs would be £7.6 billion for the funds as a whole, and would equate to 8.5% of revenue for the portfolio with the largest carbon footprint.[41]

Table 1: Potential effect of carbon costs on combined EBITDA

Portfolios ICB sector	Total CO2-e emissions	Carbon costs (£ mn)		Fall in combined EBITDA after carbon costs	
	(tonnes)	£12/tCO2-e	£57/tCO2-e	£12/tCO2-e	£57/tCO2-e
Oil & Gas*	1,963,953,342	23,567	111,945	-6.5%	-31%
Utilities	3,416,194,361	40,994	194,723	-26.7%	-127%

** Excluding two Oil & Gas companies where earnings data were not available.*

(Source: Trucost, 2009, pg 30)[42]

In the analysis of 118 equity funds managed in the UK, the power-generating utilities and oil and gas sectors are responsible for almost half of the GHG emissions attributed to their combined holdings.

Carbon liabilities and the impact on company profits

WWF's Carbon Risks report looked in detail at some of the companies that contribute most to the carbon exposure of the funds analysed. In the analysis of 118 equity funds managed in the UK, the power-generating utilities and oil and gas sectors are responsible for almost half of the GHG emissions attributed to their combined holdings. Over 582 tonnes of CO2 were emitted annually for every million pounds invested overall.

WWF has estimated the annual costs, impact on earnings, and potential future carbon liabilities that would result for a range of companies. We have calculated figures for three carbon price scenarios – £12, £57 and £75 per tonne of CO2e[43] – to demonstrate costs and risks across a range of regulatory and market conditions. These price scenarios indicate a range of risk: the upper ranges may not arise in the next few years, but they are plausible and also provide an indication of how tighter regulation of carbon will affect the cost structures of all businesses, whether or not those costs arise directly through the market price of carbon allowances.

Given that many investments in these industries will last for decades – and potentially lock economies in to a high-carbon infrastructure – it is appropriate to take a hard look at long-term carbon risks, and to plan for higher carbon prices in future. The potential impacts revealed are large but, if we take into account the fact that emissions from combustion in use currently account on average for 70% of total emissions for unconventional oils like tar sands and 80% of total emissions for conventional oils, the actual impact and costs could be higher still.[44]

Table 1 below shows the impact on annual earnings before interest, taxes, depreciation and amoritisation (EBITDA) for Shell and BP based on 2007 emissions data and the estimated total cost they would have to pay for their direct production emissions (excluding combustion emissions from the products in use).[45] The impact on earnings is calculated by subtracting the cost of paying for GHG emissions from annual earnings. Table 2 gives estimates of both companies' carbon liabilities – the amount they would have to pay in future for the direct emissions from exploiting all their reserves. The table includes data for both proved reserves and total resources. Total resources are included because the technical definition of proved reserves excludes massive reserves of in-situ tar sands.

Carbon liabilities of UK oil and gas companies

Table 2: impact of carbon costs on annual earnings* (WWF)

Company	Annual earnings (2007 EBITDA, £m)	Annual carbon costs (£m, based on 2007 emissions data)			Change in annual earnings after carbon costs		
		£12/t CO2-e	£57/t CO2-e	£75/t CO2-e	£12/t CO2-e	£57/t CO2-e	£75/t CO2-e
BP	19,831	1,826	8,673	11,412	-9%	-44%	-57%
Royal Dutch Shell	31,730	2,470	11,733	15,438	-8%	-37%	-49%

**Impact on earnings was calculated using 2007 earnings data, which were the latest available at the time of writing of the source document. BP's earnings were significantly lower than Shell's in 2007, and this explains why they are reduced by a similar percentage despite the fact that its expected carbon intensity of production is much lower. There may be an element of double-counting where costs have already been internalised under the EU ETS.*

Table 3: Carbon liabilities (WWF)

Company	Oil and gas reserves (million barrels of oil equivalent – boe)		Carbon intensity (kg of CO2-e per boe)*	Carbon emissions (million tonnes CO2-e)	Carbon liabilities (£m)		
	Reserve type	**Quantity**			**£12/t CO2-e**	**£57/t CO2-e**	**£75/t CO2-e**
BP	Oil and gas (developed)	9,932	31.0	307.9	3,695	17,550	23,092
	Oil and gas (undeveloped)	8,216	31.0	254.7	3,056	14,518	19,102
	Total proved reserves**	**18,148**		562.6	**6,751**	**32,068**	**42,194**
	Total resources***	*61,500*	*36.9*	*2,269.4*	*27,232*	*129,353*	*170,201*
Royal Dutch Shell	Oil and gas (developed)	5,368	33.8	181.4	2,177	10,342	13,608
	Oil and gas (undeveloped)	5,547	33.8	187.5	2,250	10,687	14,062
	Minable tar sands	1,346	80	107.7	1,292	6,138	8,076
	Total proved reserves	**12,261**		476.6	**5,719**	**27,167**	**35,746**
	Total resources	*66,000*	*62.6*	*4,131.6*	*49,579*	*235,501*	*309,870*

**The emissions intensity values used here are company-specific, and as such may differ from the generic tar sands emissions data quoted earlier in the report. They are at the conservative end of the range of available estimates. See Appendix 1 for more details.*

***'Proved reserves' represent oil that has been identified and which can be produced with current technology and price/economic conditions. This is based on an assessment of the probability of reserves recovery does not include unconventional energy sources like tar sands, and as such tends to understate the reserves base of a company. In 2008 BP did not have any minable tar sands reserves.*

****'Total resources' is a less restrictive measure, including the total potential reserves to which a company has access. This includes unconventional energy sources. Shell's very large in-situ tar sands reserves would only be included in the total resources figure.*

-8%

IF ROYAL DUTCH SHELL PAID £12 PER TONNE FOR ITS GLOBAL GHG EMISSIONS IN 2007, EXCLUDING 'INDIRECT' EMISSIONS FROM COMBUSTION OF THE OIL IN USE, THE COMPANY'S ANNUAL EARNINGS COULD HAVE FALLEN BY ALMOST 8%

Shell

If Shell paid £12 per tonne for its global GHG emissions in 2007, excluding 'indirect' emissions from combustion of the oil in use, the company's annual earnings could have fallen by almost 8% (as a proportion of Shell's 2007 earnings – see Appendix 1 for methodology details). If it paid £57, earnings would have been cut by 37% and if it paid £75, earnings would have been nearly cut in half – falling by 49%.

Shell's carbon liabilities could total £6 billion for proved reserves (including minable tar sands) at a £12 carbon price. At £75, Shell's carbon liabilities could total £36 billion for proved reserves, which do not include its very large in-situ tar sands reserves.

The amount of CO2 that would be produced in direct emissions alone (not including combustion in use) if Shell exploited all its declared proved tar sands reserves (1,346 million boe) is estimated at 150 MtCO2e. This figure only includes Shell's minable tar sands, which are less than 7% of its total tar sands resources. The production emissions from Shell's 20 billion barrels of total tar sands resources could be as high as 12GtCO2e. For comparison, the UK's total intended carbon budget for 2013 to 2017 is 2.2GtCO2e.[46]

Shell's Annual Report for 2008 acknowledges climate change concerns as a risk factor in the business review section. It also acknowledges that Shell is especially vulnerable, due to its large investments in tar sands and the expected increase in the CO2 intensity of their production. However, the level of detail provided is very low, and the magnitude of the costs and risks is completely unexplored.

"Rising climate change concerns could lead to additional regulatory measures that may result in project delays and higher cost.

"Emissions of greenhouse gases and associated climate change are real risks to Shell and society in general. In the future, in order to help meet the world's energy demand, we expect to produce more hydrocarbons from unconventional sources than currently. The production of hydrocarbons from those sources has an energy intensity that is a number of times higher than that for production

from conventional sources. Therefore, in the long term, it is expected that the CO2 intensity of our production will increase. If we are unable to find solutions that reduce our CO2 emissions for new and existing projects or products, future government regulation or challenges from society could lead to project delays, additional costs as well as compliance and operational risks."
(Royal Dutch Shell plc, Annual Report 2008, pg 14, emphasis in original source)[47]

A company with the wealth and resources of Shell should be devoting significant time and effort to calculating the exact nature of the risks to its future revenue from rising carbon costs and other climate change-related factors. Such analysis must already be informing internal discussions on future business strategy. The importance of these issues and the scale of the risks mean that it should be standard practice for companies – especially those in high emitting sectors – to provide detailed, quantitative analysis and key performance indicators in their mainstream annual reports to disclose this information to investors.

£1.8BN

APPLYING THE RECENT EU ETS MARKET PRICE OF £12 PER TONNE OF CO2 TO BP'S 2007 CARBON EMISSIONS (EXCLUDING INDIRECT EMISSIONS FROM COMBUSTION OF THEIR PRODUCTS IN USE) WOULD RESULT IN A CARBON COST OF £1.8 BILLION

BP

Applying the recent EU ETS market price of £12 per tonne of CO2 to BP's 2007 carbon emissions (excluding indirect emissions from combustion of their products in use) would result in a carbon cost of £1.8 billion. This equates to 9% of annual earnings. With a carbon price of £57, BP's annual earnings would be reduced by 44% due to carbon costs of £8.7 billion. And at a price of £75, BP's earnings would be cut by more than half – falling by 57%.[48] BP has recently disclosed that it currently uses a carbon price of US$40 when assessing potential new investments.

BP's carbon liabilities, at a carbon price of £12 per tonne, could be £7 billion for their proved reserves. At a carbon price of £75 per tonne these liabilities would rise to £42 billion.

In 2008, BP acquired a 50% stake in the Sunrise tar sands field in Alberta, which is operated by Husky Energy. The Sunrise field is estimated to contain 8 billion barrels of oil, which are to be extracted in situ, through the SAGD process.[49] In-situ extraction uses very large amounts of energy. It generates more emissions than surface mining, and those emissions are harder to capture using CCS technology.

The estimated cost per tonne of CO2 captured from in-situ tar sands production is US$200 to US$290. This is a huge cost for a technology that is only likely to be able to capture 10-30% of production emissions (and just 3-9% of total lifecycle emissions, including fuel combustion) for tar sands in the near term.[50]

With extraction and upgrading emissions for in-situ tar sands in the range of 118-178kg CO2 per barrel of oil produced[51], the total emissions from full exploitation of the Sunrise field could exceed 1 billion tonnes of CO2. BP expects production to reach 200,000 bpd by 2025.[52] At this rate of production, emissions could exceed 10 million tonnes of CO2 per year.

BP also plans to spend US$2.5 billion converting a refinery in Toledo, Ohio, so that it can process the synthetic crude oil produced from the tar sands. The large excess of refining capacity in the US has slashed profits in recent years. This development will lock BP into further dependency on tar sands to supply oil to its US Mid-West refineries.

2010 TAR SANDS SHAREHOLDER RESOLUTIONS

In January 2010, a coalition of investors and NGOs, coordinated by FairPensions and The Co-operative Asset Management, successfully filed shareholder resolutions to be discussed and voted on at both Shell and BP's 2010 annual general meetings (AGMs).

The resolutions called on Shell and BP to provide information to answer questions about their involvement in tar sands. They focused on the need for both companies to address investors' concerns about the risks associated with long-term oil sands projects and explain the assumptions they make when deciding to proceed with such projects.[53]

The resolutions have been supported by a large number of investors, including pension funds, fund managers, foundations, faith groups, and individuals.

Both Shell and BP were spurred into action by this initiative. In advance of the AGMs, each company released new information about the tar sands projects, and collated existing information into presentations and briefings for investors. This has provided a more coherent picture of this part of their business than the limited and fragmented information previously made available. Both companies have also held meetings with investors and with the co-filers of the resolutions to explore the issues raised. Indeed, both BP and Shell summoned the heads of their Canadian operations to London to lead intensive investor-engagement tours.

BP and Shell AGMs

The resolution at BP's AGM called for the company to disclose more information about risks linked to its Sunrise project in Alberta. The Shell resolution called for similar disclosures to be made regarding the company's current operations and future plans to exploit its massive tar sands reserves.

Over 140 investors co-filed the resolutions in advance of the AGM votes, including The Co-operative Asset Management and other large investors. Institutions worth hundreds of billions of dollars voted in favour of the resolutions, including two of the largest pension funds in the world.

Over 140 investors co-filed the resolutions in advance of the AGM votes, including The Co-operative Asset Management and other large investors. Institutions worth hundreds of billions of dollars voted in favour of the resolutions, including two of the largest pension funds in the world, the California Public Employees' Retirement System (CalPERS) and the California State Teachers' Retirement System (CalSTRS).

Over 6,000 people used the FairPensions website to contact their pension funds and other large investors to urge them to support the resolutions. Investment managers very rarely experience anything like this level of public interest from the people whose money they invest, and as a result many of them had to look into the issues and ask BP and Shell questions about tar sands for the first time.

The BP AGM, on 15 April, saw one in seven investors vote against the management (6% supported the resolution and 9% abstained, which is considered to be a vote against the management). The Shell AGM, on 15 May, resulted in over 10% of investors voting against the management.

These are considered to be significant votes, particularly for resolutions based on environmental and social risks. The results can be considered even more of a success given the scale of the efforts made by the investor relations teams of both companies to persuade investors not to support the resolutions.

The resolution process has shone a light on the tar sands business and triggered a level of disclosure that was previously absent. The companies were forced to break their silence on the details of their tar sands projects and plans. In the City of London, the issue of tar sands went from being largely invisible to being a hot topic on the lips of big investors.

BP had previously avoided discussion of tar sands. Shell had more obvious large interests in Canadian tar sands and had released more information about its mining operations, but it had never presented the information in a coherent form that facilitated understanding of the myriad risks, and had not disclosed any information about crucial assumed carbon prices and the future oil prices required to make their operations profitable.

The assumptions that are revealed in BP and Shell's respective corporate strategies have worrying implications for investors and the environment.

The progress made is significant and provides a foretaste of the kind of enhanced transparency and scrutiny that WWF-UK and The Co-operative Bank, Insurance and Investments believe should become standard practice in future. Given the very small number of resolutions filed to companies in the UK, it also serves to set an example of the potential benefits for investors of rediscovering this mechanism as one of the many engagement tools at the disposal of responsible and active owners of shares in stock market quoted companies. The use of resolutions is far more common in the US, for instance, than it is here in the UK. It is hoped that resolutions such as this one that have the reasonable concerns of responsible long-term investors at their core – rather than a simple desire to express anger or heap opprobrium on the company concerned – will start to change attitudes about their usefulness.

However, the process and the information disclosed has also revealed a number of outstanding issues – both in terms of the accuracy and completeness of the information provided, the limited capacity and willingness of some investors to engage with and act on that information, and also the worrying implications for investors and the environment of the assumptions that are revealed in BP and Shell's respective corporate strategies.

Outstanding issues for BP and Shell

BP released a series of documents in response to the resolution. A number of these are available on the company's website.[54] There are a several areas in which BP's disclosures require clarification or explanation, including:

- The total cost of producing a barrel of oil from tar sands at their own specific facilities, including the cost of refining, rather than generic industry data or extraction-only figures.
- The basis for its assertion that this oil will be profitable at oil prices as low as US$45 per barrel, which is almost three times lower than some estimates of the price needed to make tar sands profitable in the long term.
- Details of GHG emissions from all the processes involved in the Sunrise project, and an explanation of why it chooses to rely on the disputed data in the Jacobs report, rather than numerous other peer reviewed studies.

Every one of the above statements, however, is based on the 'Reference Scenario'. This assumes no new action to reduce emissions and mitigate climate change.

Many of the data sources selected by BP[55] are at the most optimistic end of the spectrum of available information. The fact that these are exceptional rather than mid-range figures demands a clear explanation as to why these particular figures have been selected.

Perhaps most worrying are the details of the energy scenario upon which BP has based its analysis. In its official response to the resolution, BP sets out the basis for its assumptions about supply and demand for world energy including oil. This includes the following assumptions:

- "World energy demand is set to increase by around 40% between 2007 and 2030 with fossil fuels still satisfying as much as 80% of that demand by the end of the period."[56]
- "Meeting this demand will require investment at more than US$1 trillion a year for the next 20 years."
- "Meeting the increase in demand for oil and replacing supplies from mature fields will require the industry to find 60 million barrels a day of new production."[57]

+6%

THIS WOULD RESULT IN AN AVERAGE GLOBAL TEMPERATURE RISE OF UP TO 6°C, WITH CATASTROPHIC CONSEQUENCES FOR PEOPLE AND THE PLANET

These statements are all based on information in the International Energy Association's (IEA) *World Energy Outlook* (2009). This report details two different future global energy scenarios. 'The 450 Scenario' analyses a world where measures are taken to limit the amount of CO2 in the atmosphere to 450ppm – the maximum level in order to have a better than 50% chance of avoiding an average global temperature rise above 2°C.

Every one of the above statements, however, is based on the 'Reference Scenario'. This assumes no new action to reduce emissions and mitigate climate change. It has startling implications:

- Rising fossil fuel use would see annual GHG emissions rise from 29Gt in 2007 to over 40Gt in 2030.
- Atmospheric GHG concentrations more than double, reaching around 1,000ppm by the end of the century.
- This would result in an average global temperature rise of up to 6°C, with catastrophic consequences for people and the planet.

If one of the world's biggest companies is forming its strategy according to these assumptions, the implications are plain to see – and disturbing. If these events – or anything close to them – do transpire, the impacts across the global economy will be devastating. Not only would those effects make a nonsense of the

assumptions made by BP about economic growth, oil prices and the profitability of oil production, but they would also decimate earnings and value across investments in every sector of the economy. This is surely not a scenario that investors would find acceptable, let alone desirable.

Shell has also released a new set of documents to explain its tar sands projects in Canada. These include an overall report and documents addressing key issues like economics, carbon emissions, water use, land reclamation, tailings ponds and community relations.[58] It has also conducted an extensive round of meetings with investors and some other interested stakeholders, and a dialogue with the co-filers of the resolution.

Shell uses very similar sources to BP for its analysis of the GHG emissions associated with its tar sands projects, and they are subject to the same weaknesses and doubts stated above. The company followed BP in disclosing that it uses a carbon price of US$40 per tonne when assessing the cost of future emissions.

Figure 2: Total AOSP GHG Emissions Intensity

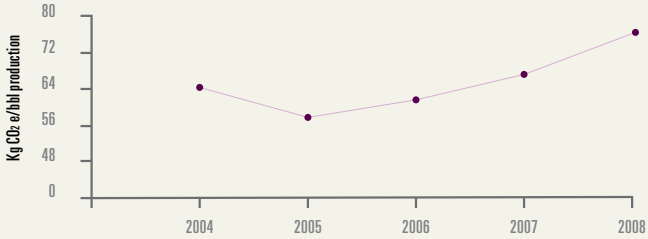
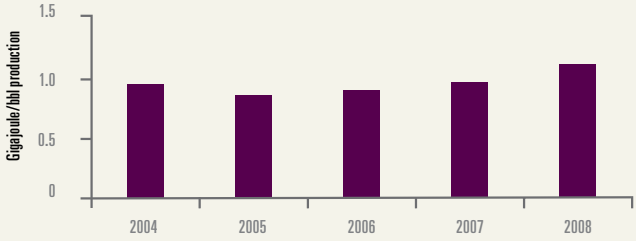


Figure 3: Total AOSP Energy Intensity – Oil Sands



Canada's Oil Sands: Issues and Opportunities – Carbon Dioxide, Shell Canada Limited, 2010.

Shell's slow-down of tar sands project expansion is temporary, and it is clear that Shell has clearly indicated that it does intend to develop remaining reserves – albeit at a slower pace and only when economic and environmental conditions suggest the timing is right.

Shell also states actual emissions data for the Athabasca Oil Sands Project (AOSP). While it stresses that the emissions from tar sands should be compared with conventional oils on a wells-to-wheels basis, Shell quotes emissions reductions from its operations on a production-only basis and measuring only direct emissions, even excluding emissions from purchased energy for their production. This provides more impressive-looking statistics, at the expense of consistency and transparency about the real impacts and associated financial costs.

Even so, Shell's report shows that the emissions-intensity and energy-intensity of the AOSP has risen every year from 2005 to 2008 (the most recent year shown in the published data).[59]

As with BP, there are a number of other areas where Shell's disclosures require clarification or explanation:

- Reliance on future technology developments including CCS is a prominent feature of Shell's statements, but this information is speculative and not based on existing or proven projects.
- There is comparatively little detail provided on assumptions regarding the likelihood of sustained high oil prices.
- The detailed information focuses on Shell's existing Athabasca Oil Sands Project, and there is no significant discussion of future in-situ tar sands extraction, despite the fact that Shell has in-situ projects at Orion Cold Lake and Peace River and the vast majority of Shell's tar sands resources are in-situ.

Among these concerns, the absence of forward-looking information on in-situ projects is particularly concerning. It is quite apparent that Shell's slow-down of tar sands project expansion is temporary, and that it does intend to develop remaining reserves – albeit it at a slower pace and only when economic and environmental conditions suggest the timing is right to rank tar sands projects higher among the opportunities in Shell's global portfolio. But there is no explanation of the likely cost of production for such future projects, nor is there any indication of the market conditions that would trigger investment in new projects or the level of oil price that would make them profitable.

In terms of the global energy outlook, Shell conducts analysis around two scenarios that it has developed. The 'Scramble Scenario' assumes governments only take action on energy efficiency and climate change in response to supply concerns or major climate shocks. This scenario involves increased use of fossil fuels like oil and coal.[60]

The 'Blueprints Scenario' involves growing local actions to address issues of economic development, energy security and pollution. It also assumes robust emissions controls and pricing resulting in accelerated development of clean energy technologies and far lower GHG emissions.

Tar sands has shifted from being a marginal concern to become a hot topic in the investment community in the UK and around the world, with pension trustees, fund managers, and investment analysts being asked about the issues and pressed to make decisions.

Rapid development of tar sands projects is described as a *'typical example of solutions being introduced with immediate benefits to energy security but some late negative consequences'*.[61] Those negative consequences include increasing opposition from water and climate lobbies and, ultimately, a *'political backlash that challenges even the best-managed projects'*.[62]

Given that Shell has stated a preference to work towards the Blueprints Scenario, it is important for investors to know how the expansion of tar sands projects and their long-term viability would be affected by such a backlash against this Scramble project; as well as to understand how their profitability would be affected by a shift to low-carbon energy under the Blueprints Scenario.

Beyond the AGM

Much has been achieved already as a result of the filing of shareholder resolutions on tar sands. Both BP and Shell have been prompted to release far more information than was previously available. Tar sands has shifted from being a marginal concern to become a hot topic in the investment community in the UK and around the world, with pension trustees, fund managers, and investment analysts being asked about the issues and pressed to make decisions. Thousands of individual people have taken action to ask their own pension funds to support the resolutions. A large number of investors have attended meetings with BP and Shell to discuss the issues and raise concerns.

Improved disclosure and dialogue have been hard won through the shareholder resolution process.

As indicated above, there are still numerous gaps, unexamined issues, and significant risks associated with investment in tar sands projects. These concern both the details of the impacts and economic viability of individual projects, and the strategic assumptions about the shape of future energy demand and supply and the global economy upon which companies are basing their decisions.

This is a base from which to build increasingly robust and comprehensive reporting mechanisms and establish increasingly strong standards of engagement from active, responsible shareholders.

Some investors have commented on the need for more disclosure and greater transparency in future. Commenting after the BP AGM, Karina Litvack, Head of Governance and Sustainable Investment at F&C Asset Management told FairPensions: *"F&C abstained on this resolution in recognition of BP's considerably improved transparency regarding its involvement in Canadian oil sands. We credit this shareholder proposal for having prompted a more productive stance by the company on investor engagement. However, F&C feels that the company still falls short in certain important respects of the standard of disclosure that we believe was requested in this resolution. We want to take this opportunity to encourage BP to take a more prominent leadership role in industry-wide efforts to find ways to better manage the cumulative impacts of oil sands development in Canada."*[63]

This is not a one-off process. It has opened a window onto the tar sands business that cannot be closed. The type of disclosure and dialogue that has been hard won through the shareholder resolution process should represent a minimum standard for ongoing transparency and scrutiny for oil and gas companies. It forms a base from which to build increasingly robust and comprehensive reporting mechanisms and establish increasingly strong standards of engagement and analysis from active, responsible shareholders.

UK INVESTORS AND PENSIONS

The UK is a global centre for fossil fuel finance. Some 12-15% of global GHG emissions are associated with the products and services of companies listed on the UK stock market.

The UK is a global centre for fossil fuel finance. Some 12-15% of global GHG emissions are associated with the products and services of companies listed on the UK stock market.[64] Investors are continuing to systematically back what may well come to be regarded in the future as 'sub-prime' toxic assets: assets that could represent a huge threat to savings, pensions and investments, while diverting finance from low-carbon businesses that should be the future of a low-carbon economy.

UK workplace pension funds own the largest proportion of shares in UK-listed companies. These pension funds had assets worth £800 billion in 2008, approximately 21% of which (£169 billion) were invested in UK equities.[65] This equates to approximately 14% of the FTSE all-share index. GHG emissions of 98 million tonnes CO2-e per year are attributable to their UK equity holdings.[66]

A further 29% of the funds' assets (£230 billion) were invested in international equities. This equates to GHG emissions of approximately 134 million tonnes CO2-e per year. Total emissions attributable to UK workplace pension funds' equity holdings would therefore be 211 million tonnes CO2-e per year.

Investment in oil and gas

WWF estimates that £35.5 billion of pension assets are invested in UK oil and gas stocks.[67] This may be a conservative estimate, as it does not include very large investments in bonds and other non-equity assets.

UK institutional investors – including pension funds, insurance companies, and other large asset owners – have huge interests in the major companies in these sectors. For example, UK institutional investors own 35% of BP shares, with UK individuals owning another 7%.[68] Shell does not publish comparable data, but its shareholder structure is likely to exhibit similar characteristics. UK investors also have very large interests in foreign-owned companies that operate in these sectors, especially those in the power generation sector which have a very large share of the UK market.

£35.5BN

WWF ESTIMATES THAT £35.5 BILLION OF PENSION ASSETS ARE INVESTED IN UK OIL AND GAS STOCKS

It is clear that investors in the UK own enough of these companies to have a big influence on how they do business. It also follows that they have a big enough stake in their future profitability to be at risk of underperformance from companies who do not adapt to a low-carbon world and are locked into activities that incur significant carbon costs.

Toxic fuels: toxic assets

The huge importance of BP to UK pension funds has become obvious since the Gulf of Mexico oil spill in 2010. At the time of writing, BP had lost an astonishing 50% of its stock market value since the disaster began. But it is not just the share price that is important: UK pension funds rely heavily on a few companies to provide income through dividend payments. BP accounts for around £1 in every £6 of dividends paid to UK investors.[69] In the light of huge cleanup and compensation costs there are real question marks being raised both by financial markets about BP's ability make these payments, and BP has recently announced the suspension of all dividend payments at least until the end of the 2010.

BP has been under enormous pressure to explain both how the spill was allowed to happen and why it has taken so long to make progress in stopping the leak and cleaning up the oil, which threatens fragile ecosystems and the economic future of communities on the Gulf of Mexico coast. There has been a great deal of criticism about the level of safety procedures, the level of preparedness to stop and clean up any spill, and about the fact that many people have never been aware of just how difficult and risky such deepwater drilling can be.

In a recent interview, Tony Hayward, the Chief Executive of BP, admitted that the company "did not have the tools you would want" to deal with the disaster, and that the company had not been fully prepared for a deepwater oil leak.[70] Looking at the impacts of the spill on the surrounding region and on the financial markets, it is astonishing that such considerations were not fully attended to. This acute and immediate disaster has shown up a massive failure of risk management and of transparency around those risks. Some sources have argued that the spill provides a further reason to expand tar sands projects instead of deepwater drilling. However, this is a highly questionable strategy, as both of these methods of oil extraction are expensive, energy intensive, highly polluting and very risky for investors.

A tar sands processing plant, Alberta, Canada. Evidence shows that opportunities to capture carbon emissions from tar sands operations are limited and very expensive, especially when compared to larger, highly concentrated sources.

While images of the oil in the Gulf of Mexico are on television screens around the world, a largely unseen disaster of huge proportions is slowly and steadily unfolding in Alberta over a period of decades. It is a remote location, and the impacts of tar sands are often harder to see or slower to manifest themselves, but the damage done may be no less severe and the environmental and financial costs just as large.

The carbon emissions from tar sands are very large and their impact is on a global scale as a contributor to rising CO2 levels that cause climate change. It is not certain yet how large a part they will play in future oil production, but it is very likely that it will cost the companies involved an increasingly large amount of money to pay for their carbon emissions or for technologies to reduce or store those emissions.

While images of the oil in the Gulf of Mexico are on television screens around the world, a largely unseen disaster of huge proportions is slowly and steadily unfolding in Alberta over a period of decades.

Oil and gas companies already report in some detail on the reserves that they hold for future extraction. Because this is disclosed in a standardised and comparable way and investors understand the financial implications, the share price of oil companies can be significantly affected today on the basis of their ability to secure production years and decades into the future. Recent changes to the disclosure rules set by the US Securities and Exchange Commission (SEC) have meant that companies are now able to book tar sands resources as oil and gas reserves (they were previously considered mining reserves), and are also allowed to publicly disclose probable and possible reserves to investors.[71] The new rules mean that companies like Shell can book far larger tar sands reserves than before.

In 2004, Shell's share price fell 16% after it was forced to downgrade its stated proved oil reserves by 3.9 billion barrels. Many shareholders were outraged at the sudden revelation, and the chairman of the company, Sir Phillip Watts, lost his job as a result of the scandal.[72] Shell had to pay fines of US$120 million to the SEC and £17 million to the UK's Financial Services Authority (FSA).[73] Shell appears to have addressed its reserves crisis by making a huge commitment to the development of unconventional sources such as tar sands, but this could mean that it is ultimately pursuing a high-risk strategy.

Shell has made much of its green credentials in the past, but in fact it has taken a decision to pull out of investing in wind and solar power. In May 2008, Shell withdrew from the £2 billion London Array offshore wind farm.[74] This decision caused anger among environmental groups, disappointment from the UK government, and concern among other investors that Shell's decision added an element of risk that put the whole project in doubt.

Companies should disclose the GHG emissions that will result from exploiting both conventional and unconventional reserves now and for planned future operations, and thus allow investors to factor in today the carbon costs that will significantly reduce their ability to profit from future production.

Institutional investors who are members of the United Nations-sponsored Principles for Responsible Investment (UNPRI), representing US$3 trillion of assets, have already registered their concerns. These investors signed up to a public letter on 8 July 2009, which questioned the viability of tar sands as long-term investments and requested that the oil companies involved improve their disclosure to shareholders of how the attendant risks are to be mitigated and their license to operate be preserved. Those risks include, *"the extremely high cost of oil sands production, the local and regional impacts on water, biodiversity and land rights, litigation and regulatory risks and most of all, the rise in global CO2 levels [that] major exploitation will contribute [to] (both relative to conventional sources and in absolute terms)"*.[75]

In the case of tar sands production, the cost of purchasing allowances for carbon emissions and/or developing and installing CCS technology or other efficiency improvements could be so large that this dirtiest segment of the oil industry fails to make a profit at all in the long run. The capital costs of building and running facilities to extract and upgrade bitumen from tar sands to produce synthetic crude oil are enormous. In a low-carbon world the ecological and climate damage caused by tar sands exploitation may well leave these investments as unprofitable and unwanted – stranded toxic assets. This could deal a crippling blow to the companies involved, and could also leave another black hole in pension funds whose assets are invested in those companies.

In a low-carbon world the ecological and climate damage caused by tar sands exploitation may well leave these investments as unprofitable and unwanted – stranded toxic assets.

What can investors do?

The reality is that large institutional investors are not going to simply pull out of sectors like oil and gas and power overnight, as this would alter the balance of their holdings to what is considered an unacceptable degree. They can, however, work much harder to invest in the best-performing companies within these sectors – measured not just according to traditional factors but also incorporating newly-available information on their performance on climate change-related factors. The exposure of companies to very large carbon costs should be considered a material factor in this decision making, especially for responsible long-term investors.

Investors can also engage far more proactively with companies on climate change factors, especially their GHG emissions. This engagement should be proactive in making it clear that carbon risks must be managed and that reducing emissions and associated costs will be viewed positively by investors deciding in which companies to place more of their assets. The 2010 shareholder resolutions at BP and Shell provide examples of how improved transparency and accountability can be achieved, but also show that there is work to be done. More and deeper engagement with investee companies improves investors' ability to assess risks and opportunities – including carbon risks – and enhances their ability to influence the strategy of companies to manage those risks and opportunities.

Opportunities to address carbon risks

Pension funds and fund managers can:

- Monitor portfolios on greenhouse gas emissions and related exposure to carbon costs under existing and planned regulatory frameworks.
- Develop processes to proactively manage emissions-related risks and opportunities in portfolios to better protect their beneficiaries' long-term savings.
- Integrate climate change criteria such as carbon performance into financial analysis, stock selection decisions and active ownership practices.
- Use existing carbon data and support robust mandatory emissions reporting requirements for companies to disclose greenhouse gas emissions and related costs to investors.
- Invest in solutions such as renewable energy and energy efficiency technologies.
- Engage with carbon-intensive investee companies to encourage them to report emissions fully, disclose carbon costs, reduce emissions and develop effective strategies to manage climate risks and opportunities.

(Source: Trucost, 2009)[76]

Private investment is the only thing that can provide the huge and sustained injection of capital to drive the shift to a low-carbon economy that will help fight climate change and serve the needs of people and the planet.

Climate change and investment – 'defusing the pension time bomb'

"Unless trustees confront the risks associated with climate change and gain a more detailed understanding of potential material impact on their pension funds, they could be ignoring a time bomb" (ACCA 2009, page 37).[77]

Governments in the UK and around the world are coming to terms with the cost of bailing out banks, and massive public investment programmes to pull their economies out of recession, while at the same time debating the measures necessary to stop dangerous and irreversible climate change.

Against this background, it is clearer than ever that private investment is the only thing that can provide the huge and sustained injection of capital to drive the shift to a low-carbon economy that will help fight climate change and serve the needs of people and the planet. The investment sector is an absolutely vital part of any plan to achieve a rapid transition to a sustainable

low-carbon economy. Governments can and must act strongly in providing the right regulatory frameworks and incentives, but these will only work if they successfully alter dysfunctional investment systems and practices so that they accelerate the economic shift rather than hold it back.

Pension funds and their trustees – unfulfilled potential

Pension funds have a built-in need to manage money responsibly, for the long term. Every pension holder wants security in their future retirement, whether that retirement comes next year, in 10 years, or in 40 years. The size of their assets and their duty to manage them for the long term makes pension funds natural candidates to be the driving force ensuring that the finance sector protects future prosperity and well-being and preserves our environment. A recent report published by the Association of Chartered Certified Accountants (ACCA) has shown that, with some exceptions, pension fund trustees – those with the power to determine the way funds are invested and significantly influence the strategy of companies – are not acting positively to drive the changes that are necessary for this to happen.[78]

One of the key findings of the ACCA report is that there is a serious lack of accountability between individual pension fund members and fund trustees, and again between trustees and the fund managers who control their investments. In each of these relationships, and in both directions, there is very little communication, including on climate change and other responsible investment issues.

Investors need better reporting

A lack of transparency around the financial impacts of climate change is a central factor in this equation. The ACCA report finds most trustees said that they thought climate change could be a material issue for their funds (it could affect their value), but they had a limited understanding of how it affects shareholder value or financial returns. There is an urgent need to improve levels of knowledge on how climate change issues affect company performance and, by extension, pension fund performance.

The plight of pension fund trustees is an excellent example of how even people with an interest and concern about how climate change affects their investments are unable to factor this concern into

investment decisions, due to a lack of information on how financial returns are affected. It is exactly this problem that would be helped by rules requiring companies to disclose accurate, comparable, quantitative information on how climate change will affect their business now and in the future. Only once companies disclose this information can investors use it to make better decisions and report to their customers or beneficiaries on their management of climate-related risk and opportunities.

"Approximately half of the value of companies in the [oil and gas] industry lies in the assets they have yet to exploit – their reserves – the value of which are significantly greater than the value of currently productive assets. As a consequence, analysis of the prospective carbon liabilities associated with those future productive reserves is vital to understanding the extent of value at risk through climate and policy related change in coming years." [79] (Institutional Investors Group on Climate Change, CERES and Investor Group on Climate Change, 2010)

At the moment, companies in the key sectors we have identified are not transparent about disclosing their future costs, and pension funds cannot assume that their fund managers are actively managing carbon risk.

At the moment, companies in the key sectors we have identified are not transparent about disclosing their future costs, and pension funds cannot assume that their fund managers are actively managing carbon risk. Indeed, interviews by Mercer found that fund managers are not yet doing so (Trucost, 2009). Findings revealed that managers do not actively consider climate change factors such as greenhouse gas emissions as part of their investment processes. The main reasons given were the expectation that governments will not achieve emissions reduction targets or establish a global carbon price; short-term pressures to generate returns; and the lack of standardised reporting frameworks needed to deliver comparable, accurate data on company emissions.

Investor behaviour is failing to change partly because the impacts of climate change are not yet clearly visible, but also because the companies they invest in are not disclosing associated risks to their financial bottom line.

The UK government needs to act now to make disclosure of these risks mandatory.

The UK government needs to act now to make disclosure of these risks mandatory. This is an essential part of the changes needed to deliver on the promises made in the Climate Change Act 2008, and to give substance to the UK's claims to be global leader in the fight against climate change.

Oil and gas and power companies reporting in detail on the very large costs they will face due to increasingly tight regulation of GHG emissions is one of the clearest ways in which the financial significance of policies to combat climate change can be disclosed. There is a direct cost for these companies, associated with their decision to commit themselves to carbon-intensive business models. By contrast, there is a direct benefit for companies with low-carbon business models. If the size of this future cost is reported to investors, then they can make informed decisions about where they place their assets to avoid losses on these big carbon investments and to seek opportunities to invest in companies that are adopting business strategies that will place them at the forefront of a low-carbon economy.

Public disclosure of future carbon liabilities can also provide information that pension fund members and trustees can use to hold their fund managers to account over the effectiveness of their management of the carbon intensity and climate resilience of their asset portfolios.

86%

OF FUND MANAGERS SURVEYED STATED THAT THEY WOULD WELCOME MANDATORY REQUIREMENTS FOR COMPANIES TO REPORT THEIR GHG EMISSIONS, AND 78% WOULD WELCOME STOCK EXCHANGE LISTINGS RULES REQUIRING COMPANIES TO DISCLOSE RISKS RELATED TO CLIMATE CHANGE

Investor demand for mandatory reporting

A report recently published by the charity FairPensions finds that 86% of fund managers surveyed stated that they would welcome mandatory requirements for companies to report their GHG emissions, and 78% would welcome stock exchange listings rules requiring companies to disclose risks related to climate change.[80]

More than half the respondents said that poor quality data on GHG emissions disclosed by firms and a lack of regulatory requirements for investee companies were barriers to incorporating climate risks and opportunities in their analysis and decision making. Short-term investment horizons were also cited as a key problem by one fund manager in the survey:

"The most significant barrier is the imbalance between the relatively short term horizons of mainstream investment analysis and the relatively long term nature of the material business impacts of climate change." (FairPensions, 2009, pg 7)[81]

This is a crucial point and a key part of the reason why companies should report future carbon liabilities – it is not sufficient to report current and historical emissions data. We need investors to be factoring in today the impact of GHG emissions that companies are locking themselves into producing in future years. Only in that way can the investment decisions be made now that take into account the embedded cost of those future emissions.

Europe's energy needs can be met by renewable power sources. However huge investment in low-carbon industries needs to begin immediately along with a strategic move away from investing in high-carbon activities. One fundamental step would be the introduction of robust mandatory carbon reporting for businesses.

RECOMMENDATIONS

Government

WWF and The Co-operative Bank, Insurance and Investments are calling on the Government to:

- Introduce mandatory reporting of corporate greenhouse gas (GHG) emissions as soon as possible, and before the 2012 deadline set in the Climate Change Act 2008.
- Provide clear guidance on the reporting of indirect emissions (Scope 3), particularly for businesses in sectors like oil and gas that generate very high indirect emissions when their products are used.
- Build on mandatory carbon disclosure and take measures to further increase transparency and the information available to investors on future carbon emissions and associated costs, risks and opportunities. Specifically UK-listed companies in the oil and gas and power generation sectors should be required to report their long-term carbon liabilities.

Companies

WWF and The Co-operative Bank, Insurance and Investments are calling on companies to:

- Disclose in detail to investors the way in which climate change factors like carbon emissions and carbon costs are expected to affect financial performance. These should consider a range of plausible regulatory and economic scenarios, including scenarios that incorporate the low levels of emissions, high price of carbon, and shift away from fossil fuels necessary to limit atmospheric CO2 at or below the level required to avoid dangerous climate change.
- The disclosures and dialogue undertaken by BP, Shell and other oil companies in response to the 2010 shareholder resolutions on tar sands should be the first step towards providing full disclosure of such environmental, social and financial risks to investors.

Investors and pension funds

WWF and The Co-operative Bank, Insurance and Investments are calling on investors and pension funds to:

- Engage with companies to encourage them to report emissions fully, to disclose forward-looking information about carbon costs and other risks associated with climate change, and to explain their emissions reduction strategy.
- Support government action to require mandatory reporting of GHG emissions by businesses, and reporting of carbon liabilities by listed companies in the oil and gas and power sectors.
- Press for comprehensive disclosure and dialogue on material environmental, social and governance risks.
- Monitor portfolio GHG emissions and exposure to carbon costs, and develop processes to manage these effectively, to protect beneficiaries' long-term investments.
- Build on the successes of the shareholder resolutions on tar sands risk disclosure at the 2010 AGMs of Shell and BP, undertaking ongoing scrutiny and analysis of the financial risks associated with unconventional and other risky oil projects.
- Proactively seek opportunities to invest in low-carbon sectors and companies developing low carbon products and services, which can be expected to deliver long-term returns on investment in a future low-carbon global economy.

APPENDIX

Methodology for carbon costs and liabilities

GHG emissions

The data in this report that is sourced from Trucost analyses direct and first-tier indirect emissions. The analysis includes direct emissions from operations and gases emitted by direct (first-tier) suppliers. This enables assessment of potential exposure to direct carbon costs applied to operational emissions, as well as to carbon costs passed on by suppliers of companies held in the portfolios. Emissions from direct (first-tier) suppliers include GHGs released by suppliers of electricity, business air travel and logistics. These emissions are generated from the production of goods and services purchased by a company. Trucost's model uses production data to calculate the supply chain impacts of a company. Most companies are not major emitters of direct GHGs, and adopting this method prevents companies effectively outsourcing accountability for emissions. In a number of sectors, indirect GHG emissions are greater than their direct emissions.

Oil and gas

The carbon liabilities estimates for Shell and BP have been produced by WWF. We have used the best data available to us, from the companies concerned and from externally produced research. This provides an imperfect and incomplete picture, but one which is nevertheless useful as an indicator of the range and scale of costs and risks to which the companies are exposed. In fact, the difficulties experienced in producing accurate data for current and future carbon emissions and costs serves to illustrate the difficulties facing anyone who is concerned to know more about these risks. This reinforces the argument for greater transparency and enhanced disclosure in this area.

Carbon liabilities

Carbon liability is a measure of the full cost the company would pay if it were charged for all of its GHG emissions now and in the future. For oil and gas sector companies, this has been calculated by multiplying total emissions from exploitation of all their reserves/ resources by the price of carbon.

Reserves
Proved developed and undeveloped reserves figures are taken from the 2008 annual reports of each company, measured as barrels of oil equivalent (boe).[82,83] Gas reserves are converted to boe at a factor of 5,800 standard cubic foot per barrel.

Proved and probable reserves data disclosed by oil and gas companies adheres to strict criteria. For example, only minable tar sands reserves are included, rather than in-situ and minable. As such, it very likely underestimates the true resource base by a large amount. For this reason, data have also been produced to estimate the emissions and costs associated with the 'total resources' of the companies concerned.

Emissions intensity
The emissions intensity of each barrel of oil has been calculated using data sources from the 2009 paper, Irresponsible Energy.[84] For conventional developed reserves, the average emissions intensity for each company for 2008 production has been used – 33.8 kilograms of carbon dioxide equivalent (kg CO2e) per barrel for Shell, and 31kg CO2e per barrel for BP. This figure has also been used for proved conventional undeveloped reserves. This is likely to underestimate the real value, as there is a trend towards increased carbon intensity as companies develop reserves that are harder to access. The average emissions intensity for each company's total resources is 62.6kg CO2e for Shell and 36.9kg CO2e for BP.

For minable tar sands reserves, an emissions intensity of 80kg CO2-e per barrel has been used.[85] Again, this is a conservative estimate, at the lower end of the range of intensities for minable tar sands and well below most estimates for in-situ tar sands. For Shell's total tar sands resources, an average emissions intensity of 105kg CO2-e was used in the source report. BP does not mention any unconventional or tar sands reserves, despite its Sunrise joint venture in Alberta with Husky Energy. This is because SEC definitions of proved and probable reserves do not include projects yet to receive sanction, like Sunrise, and additionally do not currently include in-situ tar sands reserves. All tar sands emissions data cover the extraction and upgrading of bitumen.

Carbon price

This report uses a range of indicative prices per tonne of CO2e: £12 (market price of carbon in the EU Emissions Trading Scheme in early 2009); £57 (the full social cost of carbon identified in the 2006 Stern Review); and £75 (one of the prices calculated in the UK Government's guidelines for using carbon prices in economic appraisal, based on the cost of climate change mitigation).

REFERENCES

1 Oil Sands Fever: The environmental implications of Canada's oil sands rush, Pembina Institute, November 2005..
2 The Impacts of Canadian Oil Sands Development on the United States' Economy, Canadian Energy Research Institute, October 2009.
3 Unconventional Oil: Scraping the bottom of the barrel?, Co-operative Bank, Insurance and Investments and WWF, July 2008.
4 International Energy Agency, 'World Energy Outlook 2009'
5 *Sharing the effort under a global carbon budget,* WWF and Ecofys, August 2009
6 *http://ec.europa.eu/environment/climat/climate_action.htm*
7 *www.nytimes.com/cwire/2010/03/18/18climatewire-as-senate-trio-advances-climate-measure-ener-84418.html*
8 *www.washingtonpost.com/wp-dyn/content/article/2010/04/11/AR2010041101511_2.html*
9 *Investor Statement on a Global Agreement on Climate Change,* available at *http://www.iigcc.org/publications/policy-statements*
10 *www.climatewise.org.uk/storage/ClimateWise%20Copenhagen%20Statement.pdf*
11 *Meeting Carbon Budgets – the need for a step change,* Progress report to Parliament, Committee on Climate Change, 2009.
12 *Climate Solutions 2: Low-Carbon Re-Industrialisation,* by Dr Karl Mallon, Dr Mark Hughes and Sean Kidney, Climate Risk, for WWF, October 2009.
13 Ibid.
14 The categorisation of emissions into different 'Scopes' is the generally accepted approach established by *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition),* developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), (GHG Protocol) available at *www.ghgprotocol.org.* Scope 3 emissions include all emissions released into the atmosphere as a result of your actions except those classed as 'Scope 1 direct' (fuel consumption) or 'Scope 2 indirect' (purchased electricity).
15 *The Impacts of Canadian Oil Sands Development on the United States' Economy,* Canadian Energy Research Institute, October 2009.
16 Ibid.
17 *Unconventional Oil: Scraping the bottom of the barrel?*, Co-operative Bank, Insurance and Investments and WWF, July 2008.
18 *Oil Sands Fever: The environmental implications of Canada's oil sands rush,* Pembina Institute, November 2005; *and Charpentier et al, Understanding the Canadian oil sands industry's greenhouse gas emissions,* Environmental Research Letters 4, January 2009.
19 Brandt, Adam R. & Farrell, Alexander E. *Scraping the bottom of the barrel: greenhouse gas emission consequences of a transition to low-quality and synthetic petroleum resources,* Climatic Change (2007) 84:241–263.

20 IHS Cambridge Energy Research Associates, *Growth in Canadian Oil Sands: Finding the New Balance,* 2009; based on data from: Jacobs Consultancy and Life Cycle Associates, prepared for the Alberta Energy Research Institute, *Life Cycle Assessment Comparison of North American and Imported Crudes,* AERI/Jacobs (2009).
21 Simon Mui, Luke Tonachel, and Elizabeth Shope, *GHG Emission Factors for High Carbon Intensity Crude Oils,* Natural Resources Defence Council, March 2010.
22 Op cit 3.
23 *World Energy Outlook 2009,* International Energy Agency (IEA), November 2009, quoted in The Calgary Herald, 11 November 2009 - *www.calgaryherald.com/business/Oilsands+revival+cards/2209932/story.html.*
24 *The viability of Non-Conventional Oil Development,* Innovest Strategic Value Advisors, March 2009.
25 ibid.
26 *The Peak Oil Market,* Paul Sankey, Silvio Micheloto and David T Clark, Deutsche Bank, October 2009, page 1.
27 Ibid.
28 Ibid.
29 *The Beginning of the End for Oil?* By Peter Hughes, Arthur D Little, 2009, page 7.
30 Shell, March 17, 2008 Strategy Update, *www.shell.com/home/content/media/news_and_library/press_releases/2008/strategy_update_17032008.html*
31 *Irresponsible Energy,* Oil Change International, Friends of the Earth, Platform and Greenpeace UK, May 2009.
32 *Oil & Carbon: Counting the Cost,* Paul Spedding, Nick Robins & Kirtan Mehta, HSBC, September 2008.
33 *Frequently asked questions: BP and Oil Sands,* BP, March 2010, available online at *www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/set_branch/set_investors/STAGING/local_assets/downloads/pdf/IC_BP_and_Oil_Sands_FAQs.pdf* .
34 *BP and Shell: Rising Risks. Tar Sands Update 2,* Greenpeace UK, Platform and Oil Change International, July 2009.
35 Op cit 30.
36 *The viability of Non-Conventional Oil Development, Innovest* Strategic Value Advisors, March 2009.
37 *Carbon Capture and Storage in the Alberta Oil Sands – A Dangerous Myth,* WWF and Co-operative Financial Services, October 2009.
38 Ibid.

39 *When could global warming reach 4°C?,* Hadley Centre technical note 80. Richard A. Betts, Matthew Collins, Deborah L. Hemming, Chris D. Jones, Jason A. Lowe and Michael Sanderson, December 2009.
40 *Carbon Risks in UK Equity Funds,* Trucost, July 2009.
41 This report uses a range of indicative prices per tonne of CO2: £12 (carbon price in the EU Emissions Trading Scheme in early 2010); £57 (the social cost of carbon identified in the 2006 Stern Review); £75 (one of the prices calculated in the government's recent guidelines for using carbon prices in economic appraisal, based on the cost of climate change mitigation).

42 Op cit 40.
43 A CO2 equivalent (or CO2e) is a metric measure used to compare the emissions from various greenhouse gases, such as nitrous oxides, based on their global warming potential. Carbon dioxide equivalents are commonly expressed as million metric tonnes of carbon dioxide equivalents.
44 *Carbon Capture and Storage in the Alberta Oil Sands – A Dangerous Myth,* WWF and Co-operative Financial Services, October 2009.
45 See Appendix I for details of data and methodology.
46 *Building a low-carbon economy - the UK's contribution to tackling climate change,* UK Committee on Climate Change, December 2008, pg 132.
47 *Royal Dutch Shell plc Annual Report and form 20-F for the year ended December 31, 2008, www.shell.com/home/content/investor/financial_information/annual_reports/2009/2009_annual_reports.html*
48 *Carbon Risks in UK Equity Funds,* Trucost, July 2009.
49 *www.bp.com/sectiongenericarticle.do?categoryId=9028907&contentId=7052599*
50 *Carbon Capture and Storage in the Alberta Oil Sands – A Dangerous Myth,* WWF and Co-operative Financial Services, October 2009.
51 Ibid.
52 *www.bp.com/sectiongenericarticle.do?categoryId=9028907&contentId=7052599.*
53 See FairPensions website for details of resolutions, supporting documents and related resources: *www.fairpensions.org.uk/tarsands/resolutions*
54 *www.bp.com/canada*
55 IHS Cambridge Energy Research Associates, *Growth in Canadian Oil Sands: Finding the New Balance,* 2009; based on data from: Jacobs Consultancy and Life Cycle Associates, prepared for the Alberta Energy Research Institute, *Life Cycle Assessment Comparison of North American and Imported Crudes,* AERI/Jacobs (2009).
56 The actual figure given by the IEA source data is 77% of the demand increase, not the total demand. This distinction is left unexplained in the BP document.
57 All quoted from *Oil sands resolution and response,* BP plc, February 2010.
58 Documents available online at *www.shell.ca/home/content/can-en/aboutshell/our_business*
59 *Canada's Oil Sands: Issues and Opportunities – Carbon Dioxide,* Shell Canada Limited, 2010.
60 Shell Energy Scenarios to 2050, available at *www.shell.com/home/content/aboutshell/our_strategy/shell_global_scenarios/dir_global_scenarios_07112006.html*
61 Ibid, pg 20.
62 Op cit 60.
63 *www.fairpensions.org.uk/tarsands/BP*
64 *The Carbon 100,* Trucost and Henderson Investors, June 2005.
65 *NAPF Annual Survey 2008,* National Association of Pension Funds (NAPF), October 2008.
66 GHG emissions estimates for UK and international equities assume an average carbon intensity of 582 CO2-e per £ million of equity portfolio assets, as per *Carbon Risks in UK Equity Funds,* Trucost, July 2009.

67 This estimate is based on an oil and gas sector weighting of 21.2% in the FTSE 350 on 31 December 2008, and assumes that the £169bn UK equity share of UK pension fund investments reflects the makeup of the index.
68 *www.bp.com/extendedsectiongenericarticle.do?categoryId=9010453&contentId=7019612*
69 *www.telegraph.co.uk/finance/newsbysector/energy/oilandgas/7804631/Gulf-of-Mexico-oil-spill-BP-to-mull-politics-of-shareholder-dividend-payments.html*
70 *www.ft.com/cms/s/0/e1e0e21c-6e53-11df-ab79-00144feabdc0.html*
71 *www.sec.gov/news/press/2008/2008-122.htm*
72 *http://business.timesonline.co.uk/tol/business/entrepreneur/article452148.ece.*
73 *www.nytimes.com/2004/07/30/business/shell-to-pay-150-million-in-settlement-on-reserves.html.*
74 *www.telegraph.co.uk/finance/newsbysector/energy/2789323/Shell-disappoints-with-wind-farm-withdrawal.html*
75 UNPRI investor letter – *http://www.co-operativecampaigns.co.uk/toxicfuels/downloads/UNPRI-investor-letter-on-oil-sands.pdf.*
76 Op cit 40.
77 *Pension Fund Trustees and Climate Change,* by Professor Jill Solomon, Association of Chartered Certified Accountants, 2009.
78 Ibid.
79 *Global Climate Disclosure Framework for Oil & Gas Companies,* IIGCC, CERES, and IGCC, 2010, page 4.
80 *Preparing for the Storm? UK fund managers and the risks & opportunities of climate change,* FairPensions, October 2009.
81 Ibid.
82 *www.bp.com/liveassets/bp_internet/annual_review/annual_review_2008/STAGING/local_assets/downloads_pdfs/BP_annual_report_accounts_2008.pdf*
83 *www.annualreportandform20f.shell.com/2008/servicepages/downloads/files/entire_shell_20f_08.pdf*
84 *Irresponsible Energy – Shell: The World's Most Carbon Intensive Oil Company,* by Lorne Stockman, Andrew Rowell and Steve Kretzmann, Oil Change International, Platform, Friends of the Earth International, and Greenpeace UK, May 2009.
85 Pembina Institute, *The Climate Implications of Canada's Oil Sands Development,* November 29, 2005. *http://pubs.pembina.org/reports/oilsands-climate-implications-backgrounder.pdf* (page 10).

Toxic Fuels in numbers

100% RECYCLED

50%

Almost half the carbon emissions attributable to the assets of 118 UK-managed equity funds were emitted by companies in the Oil & Gas and Power Generation sectors.

£36 BILLION

The potential carbon liability for Shell, if the company had to pay £75 per tonne for all the direct emissions from exploiting its proved oil and gas reserves and minable tar sands.

£35.5 BILLION

The estimated amount of UK workplace pension fund assets invested in shares in UK Oil & Gas companies at the end of 2008.

86%

The proportion of fund managers' should read 'The proportion of fund managers'.

WWF

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To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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