University of Glasgow

Court - Wednesday 12 February 2014

Report from the Secretary of Court

EXTRACT

SECTION A - ITEMS FOR DISCUSSION / DECISION

A.3 *Socially Responsible Investment Policy*

Court may remember that the above policy was approved in 2009 and contains a provision whereby groups from within the University may make representations in respect of an investment or investments held by the University, where those groups have concerns.

Following the last meeting of SRC Council, a request has been made that the University of Glasgow divest from fossil fuel industry companies in accordance with the University's Policy on Socially Responsible Investment.

A summary of the motion passed at the SRC Council meeting is:-

"The SRC notes that the University of Glasgow has signed up to the Environmental Association of Universities and Colleges initiative entitled 'Universities and Colleges Climate Change Commitment for Scotland' which is a public declaration of the University's intent to address climate change, and that the University intends to reduce its carbon emissions by 80% by the year 2050.

The SRC believe that these commitments are undermined by the fact that the University has investments in fossil fuel companies including Shell, BP, Chevron, Billiton and Centrica currently totalling nearly £19million. The fossil fuel industry, by extracting, processing, promoting and facilitating the use of, selling and profiting from fossil fuels, is complicit in causing climate change and its catastrophic impacts. Our University should be a role model in society and take the lead amongst UK universities by acting responsibly and helping to create a safer and cleaner future.

Therefore the SRC urge that the University extend its commitment to tackling climate change to its investment portfolio and divest from the fossil fuel companies named above within a reasonable time frame to be agreed between SRC and the University".

In accordance with the Socially Responsible Investment Policy [annexed] a working group will be established to consider this representation and advise Court. The working group will comprise: two lay members of Court, one Senate assessor, one SRC representative on Court and the Secretary of Court.

Policy on Socially Responsible Investment

The University Court is committed to socially responsible investment and will via its Investment Advisory Committee and Pension Scheme Trustees actively encourage its fund managers:

(i) to continue to commit to SRI within their investment policies; and
(ii) to continue to use the Ethical Investment Research Service (EIRIS) (or a similar service) to monitor the behaviour of companies in SRI

When a fund manager does not follow this line, the University should consider whether or not to change the manager at an appropriate and cost-effective point in time.

The one business activity in which the University should continue to instruct its fund managers not to invest is the tobacco industry as such an investment runs entirely counter to the University's direct interests in research.

Fund managers should be asked to supply copies of their voting records in relation to companies where concerns may have been expressed about lack of attention to social, ethical or environmental matters.

Groups from within the University may make representations in respect of an investment or investments held by the University, where those groups have concerns. Representations should be made in writing to the Secretary of Court. Such representations will be considered on the following basis:

1. The key criterion against which specific cases would be considered would be whether the activity complained of and substantiated by the concerned group, was wholly contrary to the University's value systems either as reflected in the Mission Statement or the Strategic Plan or in regard to wider issues of social, environmental and humanitarian concern.
2. Expressions of concern should be related to specific companies whose activities or values appear, on the basis of clear evidence, to be so far removed from the University's core values as to give grounds for serious concern. Cases would only be considered if brought forward by the SRC as the recognised student body, or a recognised trade union, or via the University's committee structure.
3. Cases would be considered by a Court group in the first instance. The group will comprise 2 lay members of Court, a Senate Assessor, an SRC representative from Court and the Secretary of Court. The group would be expected to take into account the current extent of the fund managers' engagement with the company with respect to the concerns raised. It would be for the group to decide whether there were sufficiently strong grounds to warrant engagement with the company through the mechanisms established by the fund managers where this was not already in hand, or to request strengthening of that engagement if already active. The group would ask the Investment Advisory Committee or the Pension Scheme Trustees to communicate with the fund managers about these issues.
4. If a situation arose in which such engagement did not assuage serious concerns raised about a particular company, it might be concluded by the Court on the recommendation of the Court group that it should disinvest in the company. The Investment Advisory Committee or Pension Scheme Trustees would be requested to make the financial consequences of such a decision clear to the group during the course of its deliberations.

The University will publish annually on its website a list of companies and other funds in which investments are held.

An annual report will be made to Court via the Finance Committee in respect of the investment funds.

October 2009

University of Glasgow Fossil Free Petition

As of 31st July 2012, the University of Glasgow had assets currently valued at least £18 million invested in the fossil fuel industry.

We, the undersigned, call on the University of Glasgow to divest from the fossil fuel industry, and choose a safer future for its students.

Specifically, we call on the university to:

- Make an immediate statement of principle, expressing its intention to divest its holdings in fossil fuel companies within five years
- Immediately stop making new investments in the industry
- Instruct its investment managers to wind down the university's existing holdings in the fossil fuel industry over five years

The Fossil Fuel Industry and the Case for Divestment

Glasgow University Climate Action Society

March 2014

How to use this brief

This brief explains why divestment from fossil fuel companies is in keeping with the values of the university and why it is feasible and financially prudent. This document is laid out to do three things:

• Respond directly to the University of Glasgow's Policy on Socially Responsible Investment,

• Provide a comprehensive and well-documented case supporting each major claim,

• And give people the opportunity to understand the main elements of the argument quickly.

Those seeking a relatively quick overview should examine the Executive summary, the table of contents, and the Short answers to common questions provided. Those seeking detailed information should read the entirety of the relevant section.

Contributors: [redacted]

Acknowledgements: This brief has drawn heavily from the document written for the same purpose for the University of Toronto by members of Toronto 350.org. The Climate Action Society would like to thank all members of the Toronto 350.org team for their contributions to this document.

1 | Executive summary

The governments of the world — including the governments of the United Kingdom, Canada, the United States, China, Brazil, and the 27 European Union members — have agreed we should avoid raising global temperatures to more than 2℃ above pre-industrial levels.[1] This is the threshold at which the major governments of the world have agreed that climate change becomes "dangerous". Based on hundreds of thousands of years of evidence on how the climate responds to greenhouse gases (GHGs), we can calculate the total quantity of all fossil fuels we can burn, adding the carbon they contain to the atmosphere, while still giving ourselves a good chance of avoiding a 2℃ increase.[2] To do so we must keep future GHG pollution to no more than 565 billion tonnes (gigatonnes) of carbon dioxide (CO_2). At the same time, we know that burning the world's proven reserves of coal, oil, and natural gas would produce 2,795 gigatonnes of CO_2— nearly five times as much as it would be safe to burn.[3] [4] [5] The University of Glasgow can play a role in helping humanity stay within these planetary limits by choosing to sell its investments in fossil fuel companies.

Climate change is a defining example of social injury. Firms that produce fossil fuels do not bear any economic burden as a result of the many forms of harm they are imposing on other people, including agricultural impacts, sea level rise, damage to human health, and more severe extreme weather. Likewise, those who use fossil fuels enjoy the benefits while imposing these costs on others. In order to avoid severe global injury, the total quantity of fossil fuels burned by humanity must be capped far below the level of fossil fuels available to be burned. As The Economist explains: "[C]ompanies and governments already have far more oil, gas and coal than they need...assuming temperatures are not to rise by more than 2℃".[6] The International Energy Agency supports this assessment; in their "2012 World Energy Outlook" they explain that: "[n]o more than one-third of proven reserves of fossil fuels can be consumed prior to 2050 if the world is to achieve

[1] The Heads of State, Heads of Government, Ministers, and other heads of delegation present at the United Nations Climate Change Conference 2009 in Copenhagen, Copenhagen Accord

[2] Research published in *Nature* highlights how even a limit of 2℃ of warming "is not sufficient to control many other quantities, such as transient sea level rise, ocean acidification and net primary production on land". Limiting warming to a lesser level would require even more aggressive action than described in this brief. Steinacher, Joos, and Stocker, "Allowable carbon emissions lowered by multiple climate targets", p. 197.

[3] For a more detailed explanation that is accessible to non-experts see: McKibben, *Global Warming's Terrifying New Math*

[4] Carbon Tracker Initiative*, Unburnable Carbon: Are the world's financial markets carrying a carbon bubble?*

[5] Another accessible summary of the issue can be found in this free hour-long radio program: This American Life, *Hot In My Backyard.*

[6] The Economist, *Unburnable fuel.*

the 2℃ goal".[7] The business plans of fossil fuel companies do not take this reality into account. They assume they can burn all of their proven reserves, along with any additional reserves they discover in unconventional areas like the arctic, the deep ocean, and Canada's bituminous sands.[8] [9] [10] Right now, we are adding over 35 gigatonnes of CO_2 to the atmosphere each year, and the global quantity of that pollution is rising by 3 percent per year.[11] That means that we are on track to exceed the 565 gigatonne limit within 15 years.

Two implications arise from this. First, we need to meet the world's energy needs while leaving 80 percent of the planet's fossil fuel reserves unburned.[12] As NASA climatologist James Hansen explains: "Rapid reduction of fossil fuel emissions is required for humanity to succeed in preserving a planet resembling the one on which civilization developed."[13] This requires a massive redirection of investment from funding fossil fuel energy sources to deploying different energy sources that do not alter the climate.[14] Second, the stockmarket value of fossil fuel companies is based on the outdated assumption that fossil fuel extraction and use can continue without limit. If they are allowed to do this, the global effects will be catastrophic. As such, much of the value of these companies is illusory, based on the outdated assumption that we can forever use the atmosphere as a free dumping ground for CO_2. The energy sources of the future need to be compatible with a stable climate: a fact the investment community has not yet generally accepted, but which it will be confronted with increasingly as the severity of climate change becomes more obvious. It's time for the smart money to start investing in energy sources that are compatible with a prosperous future, rather than those that threaten to afflict the world with frightening and avoidable harms.

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[7] International Energy Agency, *World Energy Outlook: 2012* , p. 25.

[8] U.S. Energy Information Administration estimates that there are 345 billion barrels of recoverable shale oil around the world, and 7,299 trillion cubic feet of shale gas: United States Energy Information Administration, Technically Recoverable Shale Oil and Shale Gas Resources: An Assessment of 137 Shale Formations in 41 Countries Outside the United States.

[9] In their 2012 annual report, Shell describes how in the future they expect more of their "production to come from unconventional sources than at present" and how "it is expected that both the CO2 intensity of our production, as well as our absolute Upstream CO2 emissions, will increase as our business grows". Royal Dutch Shell PLC, *Building an Energy Future: Annual Report and Form 20-F 2012*, p. 14.

[10] BP expresses a similar concern: "Over the long term it is likely that the carbon intensity of our upstream operations will continue to trend upwards as we move further into technically challenging and potentially more energy-intensive areas". BP PLC, *Building a stronger, safer BP: Annual Report and Form 20-F 2012*, p. 52.

[11] Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report,* p. 26.

[12] For reasons of scale and cost, it is not plausible that carbon capture and storage (CCS) will allow us to escape this reality. See: *Section 17.5 Won't carbon capture and storage (CCS) save us?*.

[13] Hansen and Sato, *Paleoclimate Implications for Human-Made Climate Change.*

[14] See: Stern, *The case for a European low-carbon economy.*

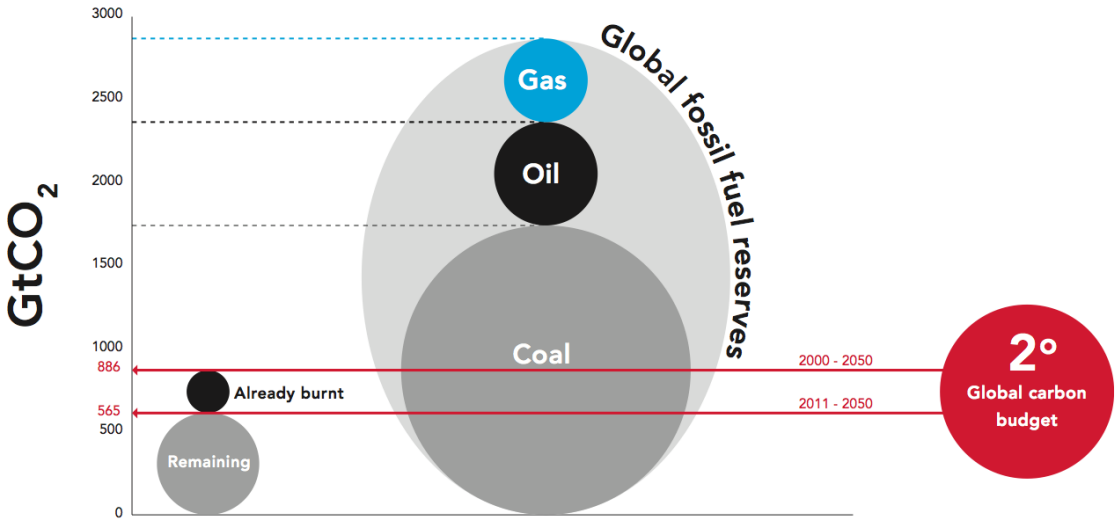

Figure 1: Comparison of the global 2℃ carbon budget with fossil fuel reserves CO_2 emissions potential. Source: Carbon Tracker Institute, "Unburnable Carbon: Are the world's financial markets carrying a carbon bubble?", p. 6.

Figure 1 from the Carbon Tracker Initiative summarizes the situation in which the world now finds itself, considering the size of fossil fuel reserves and the safe operating parameters of the planet. On the left are two circles depicting the total 'carbon budget' the world can make use of without breaching the "dangerous" 2℃ barrier. The black circle shows what has already been burned and the grey circle shows what could still be burned without breaking the budget limit. The circles to the right depict the massive quantity of potential CO_2 emissions embedded in the world's remaining coal, oil, and gas.[15] The world won't be able to shift instantly to zero-carbon forms of energy, but if we are to avoid breaching the limit we have chosen, we need to stop building new fossil-fuel infrastructure that will burden the world for decades and delay investment in forms of energy that can be relied upon indefinitely. We need to stop funding the worldwide search for unconventional fossil fuel reserves like oil sands, shale gas, and oil under what remains of the arctic ice. These objectives can be achieved without sacrificing strong financial performance, and while upholding the values of the university.

1.1 How the University of Glasgow can make a difference

The International Energy Agency expects $37 trillion to be spent on energy supply infrastructure between 2012 and 2035.[16] Humanity must decide whether to spend this money digging ourselves deeper into a pit of fossil fuel dependence, or whether to redirect it toward moving beyond fossil fuels. The University of Glasgow can help lead the necessary redirection of

[15] Carbon Tracker Initiative, *Unburnable Carbon: Are the world's financial markets carrying a carbon bubble?* , p. 6.
[16] International Energy Agency, *World Energy Outlook 2012 Factsheet.*

investment that will allow humanity to prevent climatic catastrophe while building a safe and efficient global energy system that can be relied upon indefinitely. Selling its shares in fossil fuel companies would be an effective way of contributing to this transition. As with divestment from apartheid South Africa and the tobacco industry, this choice would make a powerful statement about the kind of future the university wishes to help bring about. It would also help strip the fossil fuel industry of its social license to operate. This license is increasingly undeserved, as fossil fuel companies continue to drive the world toward dangerous climate change and impose harm on innocent people around the world and in future generations. By selling its holdings before the majority of investors accept that most remaining fossil fuel reserves are unburnable, the university can protect itself from the risk that fossil fuel stock values will fall substantially as the world realizes that their reserves are too dangerous to burn.

Universities, which collectively have endowments and pension funds worth many billions of pounds, can play an important role in driving this shift toward cost-effective approaches to CO_2 mitigation, including energy conservation and renewable energy deployment [17] University divestment of fossil fuel company shares would demonstrate that the 'smart money' is sufficiently concerned about climate change to take effective action, and could prompt other investors to reconsider their own portfolio decisions. Divestment would help reduce the danger from climate change by decreasing investor confidence in the viability of new projects like coal-fired power plants and oil pipelines. As the analysis below demonstrates, the University of Glasgow can divest all holdings of fossil fuel companies while still maintaining a stable portfolio providing attractive returns. The legacy of the University of Glasgow's investments can either be the continued support for projects that clash fundamentally with what we know to be required to preserve a safe climate, or it can be the development and deployment of energy options that are compatible with enduring prosperity for the university and humanity as a whole.

The authors and supporters of this brief call upon the University of Glasgow to:

• Make an immediate statement of principle, expressing its intention to divest its holdings in fossil fuel companies within five years.
• Immediately stop making new investments in the industry.
• Instruct its investment managers to wind down the university's existing holdings in the fossil fuel

[17] The consultancy McKinsey & Company has studied and ranked global options for mitigating GHG pollution, considering their cost, plausible deployment speed, and the scale at which they can help solve the problem. See: McKinsey & Company, *Impact of the Financial Crisis on Carbon Economics: Version 2.1 of the Global Greenhouse Gas Abatement Cost Curve,* p. 8.

industry over five years.

By investing in fossil fuel companies, the university is indicating that it is committed to fossil fuel exploitation and unconcerned about the legal and human rights records of the companies in which it invests. Divestment would send the opposite message: that the university is committed to addressing climate change, and willing to start implementing that commitment by selling its holdings in a particularly problematic investment. The university would not suffer financially as a consequence of divesting from these companies and, by doing so, it would protect itself from the risks this investment creates.[18]

Across the UK and North America, the University of Glasgow's peer schools are considering fossil fuel divestment. These include the University of Edinburgh. Ten colleges in the United States have already committed to divest.[19] By leading the way and becoming the first major university to divest, the University of Glasgow can distinguish itself as being ahead of the pack on one of the major issues of the 21st century.

If future generations are to have equal opportunities, they cannot inherit a planet that has been impoverished by uncontrolled climate change. Similarly, the principles of equity and justice forbid us from ignoring what we know about the harms of GHG pollution by continuing to impose risk and suffering on innocent people around the world today and in future generations. Scotland, Glasgow, and the University of Glasgow have historically benefitted from fossil fuel use far exceeding the global per capita average. Having benefited for decades from behaviour that we now know to be extremely damaging, the university also has a special moral obligation to be part of the solution.

This brief will explain in detail why a decision to divest would improve the financial prospects of the university, uphold its values, and permit the school to take a leadership role in a necessary global transition away from CO_2-intensive forms of energy.

[18] See: *Section 3.5 Case Study: Royal Dutch Shell*

[19] For an up-to-date list, see: http://gofossilfree.org/commitments/

Contents

2 | Climate change is a scientific fact

The core academic values of universities often include freedom of inquiry and open debate. Universities tend not take positions on social or political issues apart from those directly pertinent to higher education and academic research. Instead, their role is to provide a forum within which issues can be studied carefully and debated vigorously. Universities therefore tend not consider any proposals for restrictions on their investments that require the institution to take sides in matters that are properly the subject of ongoing academic inquiry and debate.

2.1 It is not properly the subject of ongoing academic inquiry and debate that:

- The 10,000 years of human civilization have taken place during a span of relative climatic stability.[20] [21]
- Burning coal, oil, and gas produces known quantities of carbon dioxide (CO2).[22]
- Before the industrial revolution, the concentration of CO2 in the atmosphere was approximately 280 parts per million (ppm).[23] [24]
- It has now risen to over 390 ppm, largely because of the burning of fossil fuels.[25] [26]
- Humanity is now adding 31.6 billion tonnes of CO2 to the atmosphere annually, causing the atmospheric concentration to rise at a rate of approximately 2.0 ppm per year.[27] [28] [29]
- If humanity continues to burn fossil fuels at the present rate, the concentration of CO_2 in the atmosphere will rise to well over 550 ppm by 2100.[30]
- Adding carbon dioxide to the atmosphere reduces the amount of energy the Earth radiates into space. This causes the planet to warm.[31]

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[20] This claim is supported by evidence from ice core samples taken in Vostok, Antarctica as well as other proxy measures of climate such as pollen in lake sediments and tree rings.
[21] Alley, *The Two Mile Time Machine: Ice Cores, Abrupt Climate Change, and Our Future*, p. 4.
[22] For example, the U.S. Environmental Protection Agencey (EPA) lists quantities of CO2 produced by burning a barrel of oil, metric tonne of coal, or therm (100,000 British thermal units) of natural gas: United States Environmental Protection Agency, *Calculations and References*.
[23] Evidence for this includes the records of how much fossil fuel has been burned, as well as the changing isotopic ratio of carbon in the atmosphere.
[24] Intergovernmental Panel on Climate Change, *Climate Change 2007: Working Group I: The Physical Science Basis, TS.2 Changes in Human and Natural Drivers of Climate*.
[25] Scripps Institution of Oceanography, *What Does This Number Mean?*
[26] The World Bank, *Turn Down the Heat: Why a 4°C Warmer World Must be Avoided*, p. xiv.
[27] International Energy Agency, *Redrawing the Energy-Climate Map*.
[28] National Oceanic and Atmospheric Administration, *Trends in Atmospheric Carbon Dioxide*.
[29] See also: Hansen, Kharecha, and Sato, "Climate forcing growth rates: doubling down on our Faustian bargain".
[30] Intergovernmental Panel on Climate Change, *Carbon Dioxide: Projected emissions and concentrations*.
[31] Intergovernmental Panel on Climate Change, *Climate Change 2007: Working Group I: The Physical Science Basis, TS.2 Changes in Human and Natural Drivers of Climate*.

- Based on evidence from ice cores, we know that doubling the amount of CO_2 in the atmosphere causes global temperatures to rise by about 3℃.[32]
- Governments around the world, including the government of the United Kingdom, have adopted 2℃ as the threshold beyond which climate change should be considered 'dangerous'.[33] [34] [35] [36] [37] [38]
- If the world is to avoid crossing the 2℃ limit, most of the world's remaining fossil fuels must be kept in the ground.[39] [40] [41] [42] [43] [44]

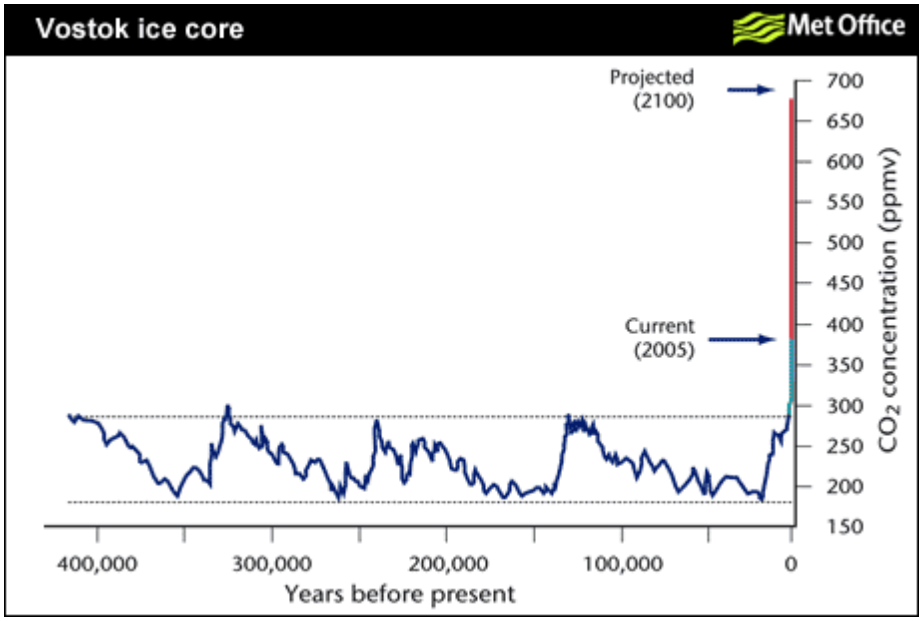

Figure 2: CO2 concentrations in an ice core from Vostok, Antarctica. Source: U.K Met Office

As depicted in figure 2, human activity – especially fossil fuel burning – has already pushed the level of CO_2 in the atmosphere far outside the range that has existed for hundreds of thousands of years.[45] Burning the world's remaining fossil fuels would put is even further outside the climatic

[32] Rockstrom et al., "A safe operating space for humanity", p. 473.
[33] The Heads of State, Heads of Government, Ministers, and other heads of delegation present at the United Nations Climate Change Conference 2009 in Copenhagen, *Copenhagen Accord*.
[34] Government of Australia Climate Commission, *The Critical Decade 2013*, p. 5.
[35] See also: Rockstrom et al., "A safe operating space for humanity", p. 473.
[36] See also: United Nations Environment Programme, *The Emissions Gap Report: Are the Copenhagen Accord Pledges Sufficient to Limit Global Warming to 2℃ or 1.5℃? A Preliminary Assessment*.
[37] Clarke et al., *2010 Muskoka G8 Summit Final Compliance Report*, p. 151.
[38] Anderson and Bows, "Beyond 'Dangerous' climate change: emission scenarios for a new world".
[39] International Energy Agency, *World Energy Outlook: 2012*.
[40] The Economist, *Unburnable fuel*.
[41] McKibben, *Global Warming's Terrifying New Math*
[42] The Australian government's Climate Commission states that most fossil fuels must be left in the ground and cannot be burned Government of Australia Climate Commission, *The Critical Decade 2013*, p. 5.
[43] Peters et al., "The challenge to keep global warming below 2℃".
[44] For a detailed rebuttal of the argument that carbon capture and storage eliminates this necessity, see: *Section 7.15 Won't carbon capture and storage (CCS) save us?*.
[45] Changes in the isotopic ratio of atmospheric carbon also allow us to identify the fraction of atmospheric CO2 resulting from fossil fuel burning.

conditions experiences by any human civilization to date. Continuing to burn fossil fuels at the current pace will also establish a rate of climatic change never experienced by humans, straining the capacity of human and natural systems to cope. We can be confident in attributing the warming we have observed to human GHG emissions. Figure 3 illustrates how climate models that incorporate all known natural climate forcings, but which exclude the effect of GHGs, cannot account for observed temperature changes. Models that incorporate the greenhouse effect from GHG pollution accord with observations on all continents and the global ocean.[46]

Comprehensive and authoritative scientific statements on the key elements of climate change date back to the 1979 I.S. National Academy of Sciences report (the Charney report).[47] The report concluded that human activities – particularly greenhouse gas emissions – were altering the climate in potentially dangerous ways. The science of climate change has been extensively examined by the Intergovernmental Panel on Climate Change (IPCC): a body established in 1988 by the World Meteorological Organization and the United Nations Environmental Program to be the leading international body on the scientific, technical, and socio-economic assessment of climate change. The four major reports of the IPCC in 1990, 1995, 2001, and 2007 have confirmed the basic conclusions of the Charney report, and elaborated considerably upon the causes and consequences of climate change.[48] [49] [50] [51] In May 2009, the national science academies of the G8 countries plus Brazil, China, South Africa, and India released a remarkable joint statement.[52] The statement explains that: "The need for urgent action to address climate change is now indisputable. For example, limiting global warming to 2℃ would require a very rapid worldwide implementation of all currently available low carbon technologies". Among other things, it recommends that all governments "adopt a long-term global goal and near-term emission reduction targets that will deliver an approximately 50 percent reduction in global emissions from 1990 levels by 2050" and "collaborate in the implementation of low carbon and climate-resilient infrastructure and technologies, and in the implementation of innovative incentives, through the use of economic and regulatory instruments, to accelerate adoption of clean "green" technologies". These findings are

[46] Intergovernmental Panel on Climate Change, *Fourth Assessment Report: Climate Change 2007*.
[47] United States National Academy of Sciences, *Ad Hoc Study Group on Carbon Dioxide and Climate*.
[48] Intergovernmental Panel on Climate Change, *First Assesment Report 1990.*
[49] Intergovernmental Panel on Climate Change, *Second Assessment Report: Climate Change, 1995.*
[50] Intergovernmental Panel on Climate Change, *Third Assessment Report: Climate Change, 2001.*
[51] Intergovernmental Panel on Climate Change, *Forth Assessment Report: Climate Change, 2007.*
[52] Academis Brasileira de Ciencias, Brazil; Royal Society of Canada, Canada; Chinese Academy of Sciences, China; Academie des Sciences, France; Deutsche Akademie der Naturforsher Leopoldina, Germany; Indian National Science Academy, India; Accademia Nazionale dei Lincei, Italy; Science Council of Japan, Japan; Academia Mexicana de Ciencias, Mexico; Russian Academy of Sciences, Russia; Academy of Science of South Africa, South Africa; Royal Society, United Kingdom; National Academy of Sciences, United States of America, G8 + 5 Academies' joint Statement: Climate change and the transformation of energy technologues for a low carbon future.

echoed in recent research, including a 2013 article in *Nature Climate Change* that emphasized how: "[a] shift to a 2℃ pathway requires immediate significant and sustained global mitigation".[53] [54]

Several significant studies have examined the state of the scientific consensus on climate change. In 2004, Naomi Oreskes published a paper in *Science* that quantified this. She examined the abstracts from 928 peer-reviewed papers and found that all of the either take no position on climate change or endorse the consensus position.[55]

She concludes:

> This analysis shows that scientist publishing in the peer-reviewed literature agree with IPCC, the National Academy of Sciences and the public statements of their professional societies. Politicians, economists, journalists and others may have the impression of confusion, disagreement, or discords among climate scientist, but that impression is incorrect.[56]

[53] Peters et al., "The challenge to keep global worming below 2C", p.1.
[54] See also: Meinshausen et al., "Greenhouse-gas emission targets for limiting global warming to 2C".
[55] Oreskes, "Beyond the Ivory Tower: The Scientific Consensus on Climate Change", 1686.
[56] Oreskes and Conway, *Merchants Of Doubt*

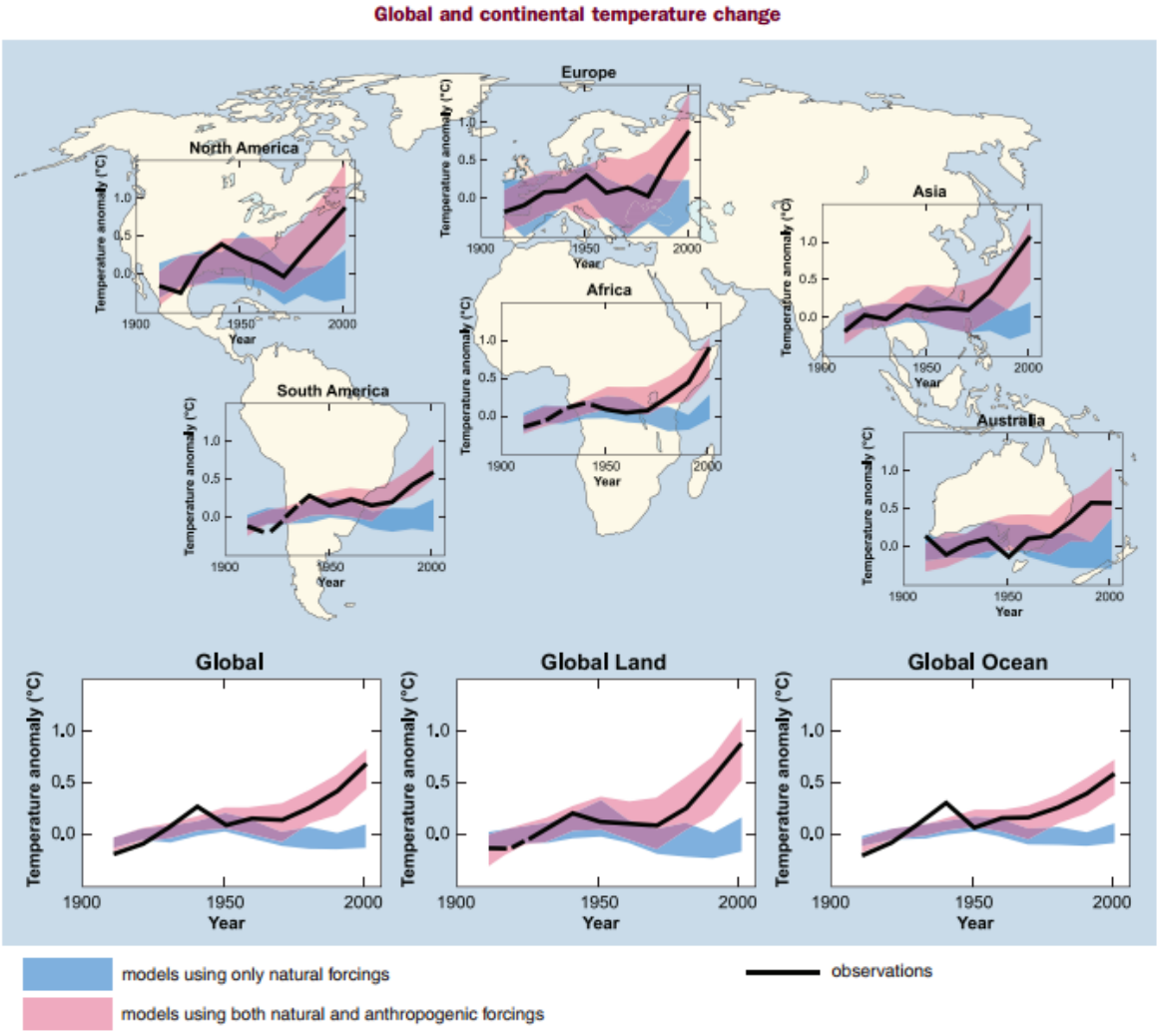

Figure 3: Global and continental temperature change. Source: IPCC 4th Assessment Report, Synthesis Report, p. 40.

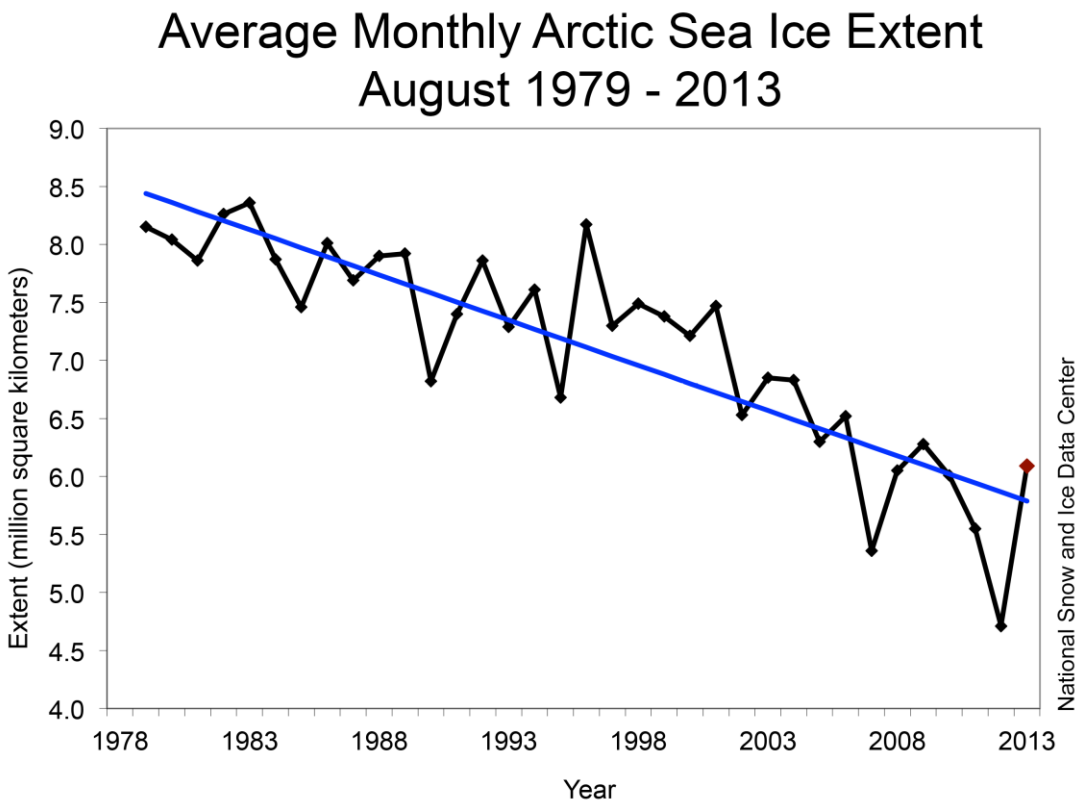

Figure 4: Monthly August ice extent for 1979 to 2013 shows a decline of 10.6% per decade. Source: U.S. National Snow and Ice Data Centre

Oreskes' 2010 book *Merchants of Doubt* elaborated on the article, discussing the strength of this consensus while also providing details on the campaigns of active disinformation that fossil fuel companies have directed at decision-makers and the general public.[57] [58] In 2010, a meta-analysis found that: "97-98 percent of the climate researchers most actively publishing in the field agree with the occurrence of anthropogenic climate change as outlined by the Intergovernmental Panel on Climate Change" and "the relative climate expertise and scientific prominence of the researchers unconvinced of climate change are substantially below that of the convinced researchers".[59] More recently, a study examined 11,944 climate-related abstracts from 1991 to 2011 and concluded that: "among abstracts expressing a position on AGW, 97.1 percent endorsed the consensus position that humans are causing global warming".[60]

Mitigating climate change is necessary on order for the university to achieve its academic mission. In the event that the world fails to curb GHG pollution and produces well over 2℃ of climate change, substantial damage is expected to be imposed on the global economy. The Stern Review on the economics of climate change concluded that under a business-as-usual scenario,

[57] See also: Hoggan and Littlemore, *Climate Cover-Up: The Crusade to Deny Global Warming*
[58] Ibid.
[59] Anderegg et al., "Expert credibility in climate change", p. 1.
[60] Cook et al., "Quantifying the consensus on anthropogenic global warming in the scientific literature".

there is "at least a 50 percent risk of exceeding 5C global average temperature change" and that "such changes would transform the physical geography of the world. A radical change in the physical geography of the world must have powerful implications for the human geography – where people live, and how they live their lives".[61] Such an outcome threatens the growth prospects of the endowment and pensions funds of the University of Glasgow. It also creates additional geopolitical risks such as agricultural disruption and forced migration. James Powell, former President of Oberlin, Franklin and Marshall, and Reed College, has concluded that the university trustees have both a quasi-legal duty to do all they can about climate change, arguing:

> The board is supposed to make sure that the endowment allows for intergenerational equity, that the students who are going to Overlin in 2075 get as much benefit from it as those there now. But with global warming, you're guaranteeing a diminution of quality of life decades out.[62]

The emergence of a strong academic consensus about the key feature of a problem does not mean that all academic work on the subject ceases. Scholarly work is still done on South African apartheid, despite the system having been dismantled. When North American universities decided to divest from South Africa in the 1980s, they determined that a convincing body of evidence supporting that choice has been assembled. A comparable body of evidence now exists about the causes and consequences of climate change. Taking action to address climate change is not needlessly taking sides in a controversial issue. Rather, it is a way to take part in a necessary global transition. If the world fails to constrain the worst impacts of climate change, serious deleterious impacts can be expected for Scotland and the University of Glasgow.

2.2 The University of Glasgow is already taking action on climate change

The university has already taken a number of actions motivated by concern about climate change and a desire to reduce the university's GHG pollution. The university's actions show climate change to be directly pertinent to higher education and academic research. It also shows climate change to be directly against the university's values "in regard to wider issues of social, environmental and humanitarian concern", as required by its Policy on Socially Responsible Investment.[63]

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[61] Stern, *The Economics of Climate Change: The Stern Review*. See long executive summary at: http://www.hm-treasury.gov.uk/d/Executive_Summary.pdf.

[62] McKibben, *The Case for Fossil-Fuel Divestment.*

[63] University of Glasgow, *Endowments, Imports & VAT Socially Responsible Investment Policy*

In 2009 the University of Glasgow signed the University and Colleges Climate Commitment for Scotland.[64] This requires a Carbon Management Plan (CMP) that details actions for reducing carbon emissions by 20 percent by 2015. The commitment acknowledges "[t]he scale and speed of climate change, and the likely effect on Scotland's people and places, impacting adversely on our economy, society and environment."[65] The University of Glasgow "consider[s] that early action to address the expected changes will create long-term economic, health, social and environmental benefits".[66] The university also promises to "[s]upport the national Climate Change programs, reducing our greenhouse gas emissions and implementing adaptation measures for future climate change scenarios".[67]

Divestment from fossil fuels stocks would be entirely in keeping with these objectives. Redirecting investment away from fossil fuels is a key part of solving the challenge of environmental sustainability and could ultimately help to reduce the speed and scale of climate change. Furthermore, by taking the lead and choosing to divest, the University of Glasgow would send and important signal about how it views the future of energy. This is also an opportunity to incorporate sustainability into university operations in a critical way, by having the university's values reflected in its stock portfolio.

The University of Glasgow has a long history of looking for energy efficiencies. In 1998 it was the first Scottish university to receive Energy Efficiency Accreditation.[68] The university has also received numerous national awards for its success at reducing its carbon footprint, including the 2007 Carbon Trust Low Carbon Buildings Award for the Scottish Centre for Ecology and the Natural Environment at Loch Lomond.[69] Over the last decade the university has invested £2.5 million in energy efficiency and to reduce carbon emissions.[70] Divesting from fossil fuels would therefore be in keeping with the values that the university has historically demonstrated to hold.

The University of Glasgow has also adopted a number of environmentally related policies. The university's Environment Policy recognizes that the university's "activities may have effects on

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64 Environmental Association for Universities and Colleges, *Universities and Colleges Climate Commitment for Scotland.*
65 Scottish Government, *Universities and Colleges Climate Commitment for Scotland*.
66 Ibid.
67 Ibid.
68 University of Glasgow, *Awards and Case Studies*.
69 University of Glasgow, *Awards and Case Studies*.
70 University of Glasgow, *Carbon Footprint.*

the environment."[71] These activities include the investments made by the University of Glasgow. Among the principles listed, the policy states that the university will:

- Demonstrate its intention to address those issues through continual improvement in environmental practices.
- Ensure legislative compliance.
- Promote a purchasing policy that will give preference, where practicable, to those products and services that cause the least harm to the environment.[72]

The policy also lists the conservation of energy and the reduction of waste as objectives.[73] Investing in the fossil fuel industry does not comply with these objectives as it involves investing in companies that cause direct harm to the environment.

The University of Glasgow's Sustainable Development Policy "aims at meeting the needs of the present concerning natural resources without compromising the ability of future generations to meet their needs".[74] The policy also states that "The University of Glasgow recognizes the significance of sustainable development in global, national and local contexts and acknowledges a commitment to the protection of the environment and the conservation of our natural resources. The university is concerned about the effects of its decisions and actions on the quality of life, the economy and world poverty, as well as the environment and natural resources. It is committed to ensure that the ideals of sustainable development are integrated into all aspects of University planning and activities".[75] The best way to conserve our natural resources - in this case, fossil fuels - is for them to remain in the ground. However, the main aim fossil fuel companies such as the ones invested in by the University of Glasgow is to extract and burn these natural resources resulting in both a destruction of natural resources and the environment itself.

Each of the university's colleges and services have identified a "Green Champion" who is responsible for leading initiatives, chosen from a list of priorities supplied by the CMC, overseeing efficiency investments and ensuring that the individual targets for their unit are met.[76] These targets cover both efficiency, such as combined heat and power, and conservation – which is more focused

[71] University of Glasgow, *Environmental Policy*.
[72] Ibid.
[73] Ibid.
[74] University of Glasgow, *University Safety and Environmental Policies*.
[75] University of Glasgow, *University Safety and Environmental Policies*.
[76] University of Glasgow, *Save It!*

on changing the behaviour of members. Some of the initiatives introduced include the university's Energy Awareness for IT equipment. A further example of the university's efforts to conserve resources is the reduced use of water by the university. Through a series of small initiatives, such as fitting time-controlled water flow values, push taps and closed-loop chillers on scientific equipment, the university has drastically reduced its water consumption. At the most detailed level of the energy efficiency hierarchy are individual buildings. Following energy assessments, each public building above a threshold size receives specific energy management targets to improve performance. Implemented between 1995 and 2005, these initiatives are estimated to have saved over 320,000m of water and effluent and almost £500,000 from the university's water usage between 1995 and 2005. A number of awards recognize the university's efforts to reduce its carbon footprint. These include:

- Carbon Trust Standard - replacing the previous Energy Efficiency Accreditation - in 2010.[77]
- Green Gown Award for sustainable procurement in 2005/6 and for energy efficiency in 2004/05.[78]
- Scottish Power Energy Award for the design of the Biomedical and Cardiovascular buildings in 2006.[79]
- British Institute of Facilities Management Best New Build Award and the Carbon Trust Low Carbon Buildings Award for the Scottish Centre for Ecology and the Natural Environment at Loch Lomond in 2007.[80]
- Cycling Scotland, Cycle Friendly Employer Award in 2009.[81]
- Decent performance in People and Planet Green League (environmental performance) – lower second class award.[82]

The University of Glasgow hires paid staff members each year as part Glasgow University Environmental Sustainability Team (GUEST). GUEST is a group of 12 students, each targeting areas within the university to improve environmental and sustainability impacts of the university.[83] Positions include:

[77] University of Glasgow, *Carbon and Energy Management policy.*
[78] University of Glasgow, *Awards and Case Studies.*
[79] Ibid.
[80] University of Glasgow, *Awards and Case Studies.*
[81] University of Glasgow, *University of Glasgow Strategic Travel Plan 2010-2015.*
[82] People & Planet, *Green League 2013.*
[83] University of Glasgow, *Save It!*

- Energy Conservation
- Biodiversity
- Sustainable Transport
- Events and Journalism
- Recycling
- Sustainable Food
- Willowbank Community Garden
- Sustainable Academia
- Co-ordinator and Assistant Co-ordinators

Given that the University of Glasgow has already acknowledged the threat that climate change poses, and has taken decisive action to mitigate that threat, it follows that the university should not invest in the industry which is driving climate change.

2.3 Fossil fuel companies acknowledge the reality and danger of climate change

Fossil fuel companies explicitly acknowledge that climate change poses a threat to the world at large, as well as to their operations and profitability.[84] [85] [86] In their 2011 submission to the Carbon Disclosure Project, ExxonMobil acknowledged, "risks to society and ecosystems from rising greenhouse gas emissions."[87] In the same document, ExxonMobil acknowledges that climate change may alter "risks of weather extremes" and states that they "manage these risks through robust design and operations contingency planning." Speaking at the Council on Foreign Relations on June 27th 2012, ExxonMobil CEO Rex Tillerson stated: "So I'm not disputing that increasing CO_2 emissions in the atmosphere is going to have an impact. It'll have a warming impact".[88] On their website, ConocoPhillips recognizes that: "human activity, including the burning of fossil fuels, is contributing to increased concentrations of greenhouse gases (GHG) in the atmosphere that can lead to adverse changes in global climate".[89] They also assert that "effective climate change policy must [...] [r]esult in the stabilization of global GHG atmospheric concentrations at safe levels". On their global website, Shell says that: "CO_2 emissions must be reduced to avoid serious climate change".[90] [91] Chevron's website asserts that: "a successful climate policy will be one in which the

[84] Cheeseman, *Oil Companies are Actually Planning for Climate Change*.
[85] Koronowski, *Oil companies that caused climate change now fear its financial impacts*.
[86] Skuce, *Big Oil and the Demise of Crude Climate Change Denial*.
[87] Sheppard, *Energy Companies Say One Thing, Do the Opposite on Climate Change*.
[88] ExxonMobil, *Carbon Disclosure Project: CDP 2011 Investor CDP 2011 Information Request*.
[89] Tillerson, *The New North American Energy Paradigm: Reshaping the Future*.
[90] ConocoPhillips, *Climate Change Position*.
[91] Shell also has a climate change advisor, with a blog at: *http://blogs.shell.com/climatechange/*

reduction of GHGs is accomplished equitably by the top emitting countries of the world through long-term and coordinated national frameworks".[92] On BP's website, they summarize the conclusions of the IPCC and say that, even with more aggressive GHG mitigation policies intended to curb growth in CO_2 emissions, it will "probably not [be] enough to limit warming to no more than 2℃".[93]

[92] Chevron, *Climate Change*

[93] BP, *Climate change: Addressing the global challenge of climate change will require the efforts of governments, industry and individuals*.

3 | The activities of fossil fuel companies are socially injurious, and this social injury cannot be reasonably remedied through shareholder voice

3.1 From the University of Glasgow's Socially Responsible Investment Policy

The key criterion against which specific cases would be considered would be whether the activity complained of and substantiated by the concerned group, was wholly contrary to the University's value systems either as reflected in the Mission Statement or the Strategic Plan or in regard to wider issues of social, environmental and humanitarian concern.

3.2 Social Injury

The primary activities of fossil fuel companies impose social injury on consumers, employees, and other persons. The burning of a large portion of the world's remaining reserves of fossil fuels would inflict great social injury through:

1. Impacts on agriculture
2. The inundation of coastal areas
3. Storms, floods, other extreme weather
4. Increased risks to human health
5. Ecosystem collapse
6. Threats to the infrastructure of cities, including Glasgow
7. The threat of abrupt and non-linear adverse climate impacts, arising from positive feedback effects and important thresholds in the climate system
8. Security implications

In their 2007 report, the IPCC included a table (See: Figure 6) that summarized how various forms of injury associated with climate change can be expected to worsen as the amount of warming increases.

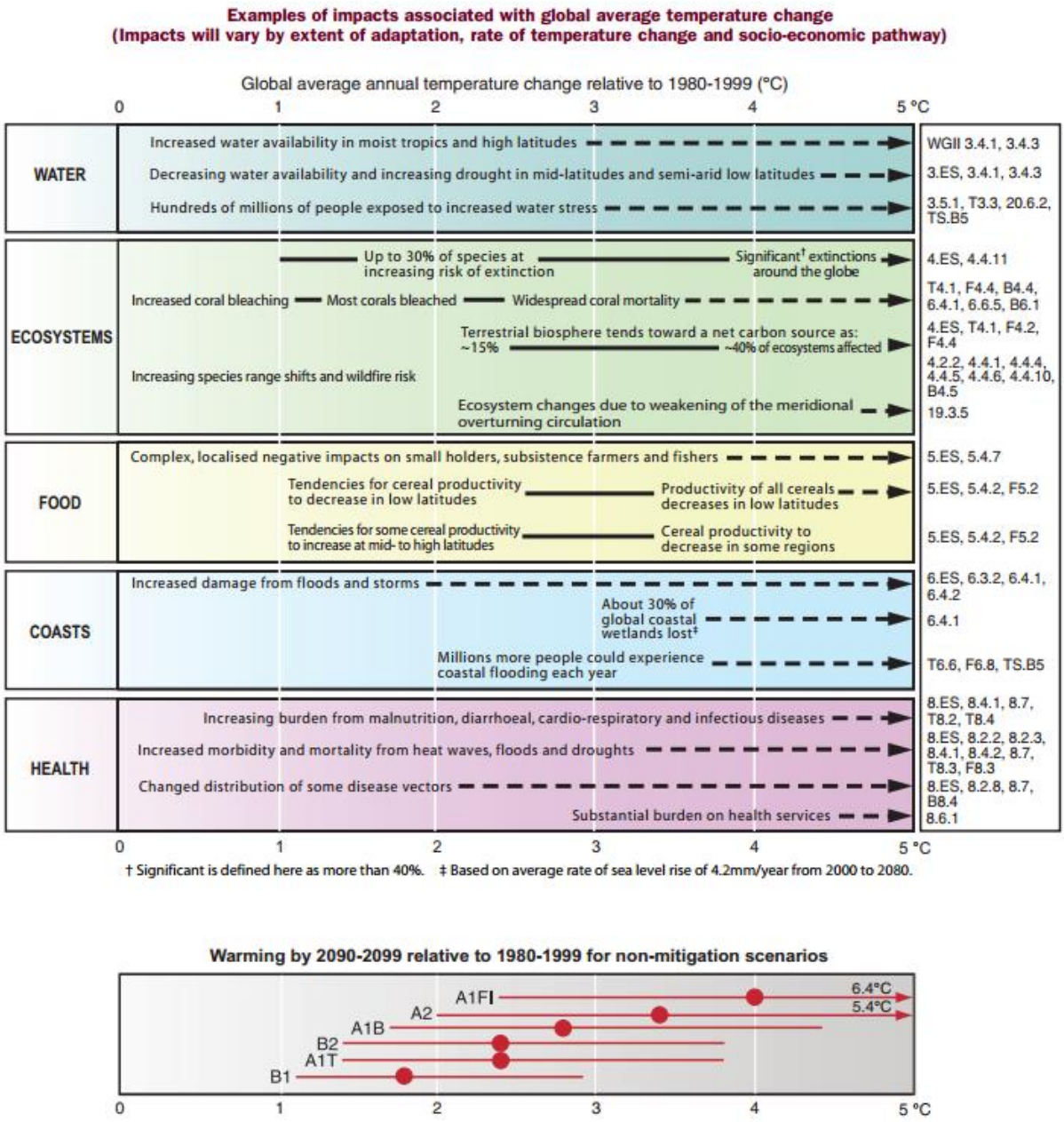

Figure 6: Examples of impacts associated with global average temperature change. Source: IPCC 4th Assessment Report, Synthesis Report, p. 51

Each of these impacts has consequences for human beings, and each represents a form of social injury being imposed on innocent people by the producers of fossil fuels. According to the United Nations Development Programme, "climate change... already imposes substantial costs, with the brunt of them borne by poor countries and poor communities".[94] [95] This harm is not exclusively imposed on poor countries, and can be expected to worsen in a business-as-usual scenario: "Climate change and local stresses on natural resources and ecosystems are increasing

[94] United Nations Development Programme, *Human Development Report 2013: The Rise of the South: Human Progress in a Diverse World*, p. 34.
[95] See also: The World Bank, *World Bank Development Report 2010: Development and Climate Change*.

pressure on the environment in almost all countries, regardless of their stage of development. Unless action is taken urgently, future progress in human development will be threatened".96 A 2009 report by the Global Humanitarian Forum concluded that: "every year climate change leaves over 300,000 people dead, 325 million people seriously affected, and economic losses of US$125 billion".97

According to climate projections by the Met office temperatures in the UK will have risen by the 2050s from 1℃ to 2℃ and by the 2080s to 3℃, measured against a 1961 to 1990 average.98 These scenarios, however, are based on a low carbon emission scenario. A high emission scenario would lead to a rise of about 2℃ to 3℃ by the 2050s and up to 4℃ by the 2080s, the Met office concludes.99

Climate change will be expensive for the UK. Worldwide climate change costs about US$1 billion per day[100] and "[…] is estimated to have already cost the world close to 1% of GDP, the negative effects of the carbon economy add a further 0.7% of GDP to today's losses."[101] Without any action against climate change, these costs could "[…] double by 2030, lowering world GDP by well over 3 percent." "Both climate change and carbon economy costs grow as emissions expand and are lessened as they are cut."[102]

In Europe, damage through flooding is expected to result in vast costs for governments. The cost of flood damage is €4.5 billion annually for Europe, and this number is expected to increase with the intensification of climate change, so that the estimated costs for flood damage are €23billion for 2050. [103] In England the "[…] cost of homes, belongings, businesses, and infrastructure […]" destroyed in the Somerset flooding of 2014 "[…] has been at least £1 billion."[104] Further costs for making the recently damaged region Somerset flooding-proof in the future are estimated to be £100 million,[105] which is still calculated to be less than not to make the

[96] United Nations Development Programme, *Human Development Report 2013: The Rise of the South: Human Progress in a Diverse World*, p. 87.
[97] Global Humanitarian Forum, *The Anatomy of A Silent Crisis*, p. 1.
[98] UK Climate Projections 2009, *Annual Temperature.*
[99] UK Climate Projections 2009, *High Emissions.*
[100] Climate Policy Initiative, *Global Landscape of Climate Finance 2013*, p.1
[101] DARA, Climate Vulnerability Forum: *Climate Vulnerability monitor. A guide to the cold calculus of a hot planet*, p. 24.
[102] Ibid.
[103] Fong, *Flood Damage costs across Europe to soar to €23 billion by 2050*.
[104] Ibid.
[105] BBC News, *Bridgwater barrage in £100m Somerset flood plan.*

area flood-proof and only pay for occurring damages.[106]

The Scottish Government identified the trends of climate change in Scotland as "hotter and drier summers, milder and wetter winters, a greater proportion of rain in heavy downpours, and sea level rise," with specific weather events such as "heat waves, droughts, floods, fewer cold snaps, and storms". The implications of these changes are "damage to critical infrastructure and other assets, effects on biological and industrial processes, effects on working conditions, changing lifestyles and consumer tastes, and an increasing awareness of climate change." The consequences are expected to be a "disruption to economic activity or public services", increased costs of "energy, water, repair, maintenance, and insurance", "changing markets, effects on reputations of government, companies, local authorities and other agencies, health implications", and changing productivity patterns.[107]

The Secretary of State for Energy and Climate Change, Ed Davey stated in 2013 that "our main challenge is to agree international actions that will reduce emissions enough to avoid really dangerous climate change, keeping global temperature rise to no more than 2 degrees above pre-industrial levels."[108]

A recent study by Matthews and Graham shows that the UK is causing a disproportionate share of damage to the climate, in relation to its size. The study also identifies the UK as one of the top seven countries contributing to climate change worldwide, next to the United States, China, Russia, Brazil, India, and Germany, all of which "[…] alone account for 63% of the warming up to 2005 […]"[109]

The University of Glasgow states in its Policy on Socially Responsible Investment that divestment would be considered if the "the activity complained of and substantiated by the concerned group, was wholly contrary to the University's value systems either as reflected in the Mission Statement or the Strategic Plan or in regard to wider issues of social, environmental, and humanitarian concern." The university furthermore urges its fund managers to evaluate its investments with regards to social responsibility and to consider advice by the Ethical Investment

[106] Fong *Flood Damage costs across Europe to soar to €23 billion by 2050*
[107] Scottish Government, *Public Bodies Climate Change Duties: Putting them into Practice – Guidance required by part 4 of the Climate Change (Scotland) Act,* p. 90.
[108] Ed Davey, *Climate Change, Acting on Science.*
[109] Matthews, Graham, et al, *National contributions to observed global warming*, pp. 3-6.

Research Service (EIRIS).[110] Climate change is a defining case of an issue of social, environmental and humanitarian concern. Furthermore, EIRIS, which the University of Glasgow lists as a source of advice, published a report in 2008, strongly urging investors to consider the effects that their investments will have on climate change.[111] The rest of this section lists many injurious impacts fossil fuel companies are having on the environment, and persons in the UK and around the world, which proves that climate change is not only of environmental, but also of social and humanitarian concern.

Pricing the cost of social carbon

Many organizations have attempted to quantify the "social cost of carbon" — the amount of damage done to third parties by emitting one tonne of CO2. For instance, the U.S. Department of Energy recently increased its estimate from $22 per tonne to $36.[112] [113] [114] [115] In the United Kingdom, the government has been using a "shadow cost" of carbon to estimate social harm since 2007.[116] The Department for Environment, Food and Rural Affairs explains that: "The social cost of carbon (SCC) measures the full global cost today of an incremental unit of carbon (or equivalent amount of other greenhouse gases) emitted now, summing the full global cost of the damage it imposes over the whole of its time in the atmosphere. It measures the scale of the externality which needs to be incorporated into decisions on policy and investment options in government". The Stern Review estimated a social cost of carbon of about $30 per ton of CO2 equivalent in 2000.[117]

In a 2013 study, the World Bank concluded that "[r]egional, national and subnational carbon pricing initiatives are proliferating", with systems implemented in California, Quebec, Switzerland, the European Union, Kazakhstan, Tokyo, Australia, and New Zealand.[118] Systems are also under consideration in Chile, Brazil, Turkey, Ukraine, China, and Japan. The report explains that "[n]ew approaches are emerging to ensure ambition and price stabilization", that "[n]ational and regional trading schemes are starting to link up" and that "[c]limate change requires urgent action at scale".[119]

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[110] University of Glasgow, *Policy on Socially Responsible Investment.*
[111] EIRIS, *The state we're in: global corporate response to climate change and implications for investor,* pp.1-5.
[112] Plumer, *An obscure new rule on microwaves can tell us a lot about Obama's climate policies*.
[113] Henn, *The White House Just Strengthened the Case for Fossil Fuel Divestment*.
[114] See also: Wald, *New Effort to Quantify 'Social Cost' of Pollution*.
[115] Stastna, *U.S. ups 'social cost' of carbon emissions*.
[116] Price, Thornton, and Nelson, *The Social Cost of Carbon and the Shadow Price of Carbon: What they are, and how*
[117] Stern, *The Economics of Climate Change: The Stern Review*.
[118] The World Bank, *Mapping carbon pricing initiatives : developments and prospects*, p. 11.
[119] Ibid., p. 12–13. [The World Bank, *Mapping carbon pricing initiatives : developments and prospects*,]

As pointed out by Peter Foster, determining the appropriate social price of CO2 is made more complicated by the need to somehow incorporate the worst-case scenarios associated with global climate change.[120] For instance, if we add enough CO2 to the atmosphere to cause the eventual disintegration of a large fraction of the world's ice sheets, raising global sea levels by tens of metres, millions of people would be displaced and a huge part of the planet's cultural legacy would be forever destroyed. It is challenging to identify how such possibilities factor into a per-tonne estimate of the damage caused by GHG pollution. Nevertheless, putting a price on carbon is an effective way of encouraging cost-effective reductions in GHG emissions.

Impacts on agriculture

Agriculture is widely considered exceptionally vulnerable to climate change, in large part because food production depends on stable climate cycles and weather patterns. For instance, in their Fourth Assessment Report, the IPCC concluded that some African countries' agricultural production, including access to food, "is projected to be severely compromised" by climate change.[121] Production from agriculture and forestry is expected to decline in Australia and New Zealand by 2030, and in Latin America "[c]hanges in precipitation patterns and the disappearance of glaciers are projected to significantly affect water availability for human consumption, agriculture and energy generation". The 2013 U.N. Human Development Report explained: "Although low HDI [human development index] countries contribute the least to global climate change, they are likely to endure the greatest loss in annual rainfall and the sharpest increase in its variability, with dire implications for agricultural production and livelihoods".[122] A 2013 study in *Nature Climate Change* determined that "food price spikes may increase in prevalence in future years".[123] [124] [125] A report from the International Food Policy Research Institute (IFPRI) found that: "agriculture and human well-being will be negatively affected by climate change".[126] The report predicts crop declines in developing countries, especially in South Asia; price increases for the most important agricultural crops, including rice, wheat, maize, and soybeans; lower calorie availability throughout the developing world in 2050 when compared with both a no-climate-change scenario

[120] Foster, *Pricing for apocalyptic externalities*.
[121] Intergovernmental Panel on Climate Change, *Fourth Assessment Report: Climate Change 2007*, See: Synthesis report, Table SPM.2. Examples of some projected regional impacts. *https://www.ipcc.ch/publications_and_data/ar4/syr/en/spms3.html*.
[122] United Nations Development Programme, *Human Development Report 2013: The Rise of the South: Human Progress in a Diverse World*, p. 6.
[123] Iizumi et al., "Prediction of seasonal climate-induced variations in global food production", p. 1.
[124] See also: Intergovernmental Panel on Climate Change, *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*.
[125] Funk and Brown, "Declining global per capita agricultural production and warming oceans threaten food security", p. 271–289.
[126] Nelson et al., *Food Policy Report: Climate Change Impact on Agriculture and Costs of Adaptation*, p. vii.

and 2000 levels; 20 percent more child malnutrition than in a world with no climate change; and costs of US$7.1 to $7.3 billion to raise calorie consumption sufficiently to offset the health impacts of climate change on children.[127] [128]

In the UK, the Climate Change Risk Assessment (CCRA) has outlined the predicted effects of climate change on the country's agriculture and forestry, concluding that climate change and severe weather events will endanger crops due to coastal erosion, flooding, and droughts.[129] There is also the possibility of water shortages by the 2020s, due to climate change combined with population growth. Demand for water is likely to increase when temperatures rise, causing the soil to dry out, and as the growing population requires more food. If these developments are added to the effects of warmer summers, and lower river flows, then – so the Adaptation Sub-Committee concludes - "this could create a supply-demand imbalance for agriculture of between 45 and 115 billion litres in a dry year in the next 10 to 20 years".[130] Additionally, further problems may be presented by erosion and decreased organic matter, leading soil degradation and thus a reduction of the "productive capacity of the land", especially if soils are intensely farmed.[131]

In addition to agriculture, the timber industry is also expected to be affected negatively by climate change. The timber industry faces the risks of, firstly, declining woodlands due to the growing danger of wildfires in warmer and drier summers, and "new tree diseases and insect pests". Secondly, the quality of the timber is likely to be affected negatively as a result of increased droughts.[132]

For north-west Europe, and thus the UK, rising temperatures could represent an opportunity to increase agricultural production, research suggests. A study by the Committee on Climate Change finds that, in the UK, the rise of temperatures and longer growing seasons could present conditions for farmers to "increase productivity and so benefit from potential increases in global food prices." Nevertheless, the threats of "water scarcity, loss of soil fertility, or persistent presence of pests and diseases" can easily nullify these possibilities. The problem of water shortages is especially pressing since "much of the cropland in England is located in areas where water resources are already over-

[127] Nelson et al., *Food Policy Report: Climate Change Impact on Agriculture and Costs of Adaptation*, p. vii.
[128] See also: Wheeler and Braun, "Climate Change Impacts on Global Food Security".
[129] Department for Environment, Food, and Rural Affairs, *UK Climate Change Risk Assessment: Government Report*, p.15.
[130] Adaptation Sub-Committee, *Managing the land in a changing climate*, p.19.
[131] Ibid., p.19.
[132] Department for Environment, Food, and Rural Affairs, *UK Climate Change Risk Assessment: Government Report*, p.15.

stretched. These pressures are likely to grow from the combined effects of climate change and increased demand from economic and population growth."[133] The climate change adviser of the National Farmers Union (NFU), Dr Ceris Jones, also warned in 2013 that "[...] the last 18 months, during which farmers have suffered droughts, floods, and drifting snow, shows how vulnerable our industry is to extreme weather events, which are also projected to increase."[134] His concerns are justified; in recent years the UK has suffered multiple severe weather events, which also impacted agricultural production. The most recent example is the floods in South England of early 2014, which were caused by a series of storms, resulting in severe flooding in Somerset and along the river Thames. Thousands of properties were destroyed and public transport was severely disrupted.[135] The effects of these floods on farmers are severe. Olivia Midgley explains that, "several farmers in the area have lost arable crops worth £250,000 and constant waterlogging has seen many areas of land completely written off. Livestock farmers have had to sell or send animals away due to fields and buildings being submerged in several feet of water and road closures have caused a further nightmare for deliveries and day-to-day business."[136] The reparation of occurred damages, combined with preparation for future flooding is estimated to lead to costs of over £100,000, so the Royal Bath and West of England Society estimate.[137]

About a year ago, in late March 2013, the UK experienced unusual weather, with snow and temperatures below average, which cause power-cuts, closed schools, and disrupted agricultural production, by with a high number of dying sheep and lamb.[138] From 2010 to 2012, England and Wales experienced rainfall below the average, which had negative impacts on farmers and livestock, due to low ground water levels and wildfires.[139] This drought was then followed by a record rainfall from April to July 2012. Waterlogging hindered access to land and caused crops to rot, thus reducing agricultural output. Other effects of these severe rainfalls were disruption of transport, destruction of habitat for ground-nesting birds, flooding, landslides and cliff collapses in the south-west of England.[140]

Moreover, prolonged heat waves and periods of drought are projected to intensify globally, concurrent with accelerating warming of global temperatures caused by the increase of GHG levels

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[133] Adaptation Sub-Committee, *Managing the land in a changing climate*, p. 9
[134] Jones, National Farmers' Union (NFU) climate change adviser, see: http://www.nfuonline.com/science-environment/climate-change/changing-climate-report--nfu-comment/.
[135] Met Office, *Winter storms, January to February 2014.*
[136] Midgley, *Somerset Levels farmers facing uncertain future as flooding crisis continues*.
[137] Ibid.
[138] Met Office, *Snow and low temperatures in late March 2013.*
[139] Met Office, *England and Wales Drought 2010 to 2012.*
[140] Met Office, *Record Rainfall – April to July.*

in the atmosphere.[141] [142] [143] The IPCC expects increased incidence of drought in Asia, Australia and New Zealand, and Europe. In North America, it expects "[w]arming in western mountains... to cause decreased snowpack, more winter flooding and reduced summer flows, exacerbating competition for over-allocated water resources".[144]

The IFPRI finds that declines in yields of one critical world crop — wheat — will become greater the longer mitigation is delayed. Using a 2000 baseline, they project a decline in yield for rain-fed wheat in the developed world of 1.3 percent by 2030, 4.2 percent by 2050, and 14.3 percent by 2080.[145] Up to 2050, climate change's impact on agriculture might be manageable to some extent; however, the IFPRI report concludes: "[s]tarting the process of slowing emissions growth today is critical to avoiding a calamitous post-2050 future".[146] Although adaptation strategies may provide certain methods for dealing with select risks to agricultural production that are directly associated with climate change, climate change mitigation thorough reducing GHG emissions is essential to the long-term health and prosperity of the agricultural sector in the UK.

The inundation of coastal areas

Climate change is also threatening the UK's coasts, since the "[...] rising sea levels could lead to the loss of coastal habitats that help to prevent flooding and erosion, as well as the loss of agricultural land and increased risk to people and properties."[147] At the moment, 17% of the UK's coasts are experiencing erosion.[148] According to the Marine Climate Change Impacts Partnership (MCCIP), "projections of change in the UK suggest a rise of between 12 and 76cm by 2095, compared to a 1980–1999 baseline. This approximately equates to rates of between 1.2 and 7.6 mm per year respectively."[149] In addition, the sea temperature is likely to rise until 2080 in the UK and north-eastern Atlantic.[150]

A 2013 study published in *Nature Climate Change* projects that global flood losses will

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141 Coumou and Robinson, "Historic and future increase in the global land area affected by monthly heat extremes".
142 See also: ScienceDaily, *Heat Waves to Become Much More Frequent and Severe*.
143 Tollefson, *Heatwaves blamed on global warming*.
144 Intergovernmental Panel on Climate Change, *Fourth Assessment Report: Climate Change 2007*, See: Synthesis report, Table SPM.2. Examples of some projected regional impacts. *https://www.ipcc.ch/publications_and_data/ar4/syr/en/spms3.html*.
145 Nelson et al., *Food Security, Farming, and Climate Change to 2050: Scenarios, Results, Policy Options*, p. 85.
146 Ibid., p. xxi.
147 Adaptation Sub-Committee, *Managing the land in a changing climate*, p.16.
148 MCCIP, *Marine climate change impacts,* p.5.
149 MCCIP, *Marine climate change impacts,* p.4.
150 MCCIP, *Marine climate change impacts,* p.4.

increase to over US$1 trillion in 2050, unless present levels of protection are upgraded. [151] [152] [153] This matches with the findings of the UK's Adaptation Sub-Committee in its report 'Managing the land in a changing climate' (2013), which found that "sea level rise is likely to increase the spending requirement for coastal defence to £200 million each year by 2030, a 60 percent increase on current spending levels."[154] Further financial burdens are likely to arise since, for instance, rising sea levels and severe weather events are expected to cause disruptions in the UK's ports. [155]

Sea level rise from climate change is also expected to cause substantial impacts globally. In the United States, cities like New York and entire low-lying states like Florida are vulnerable.[156] Since 2009, the U.S. Army Corps of Engineers has been incorporating sea level rise into all civil-works programs.[157] Four of Florida's southernmost counties have formed the Southeast Florida Regional Climate Change Compact, which calls upon them to: "develop a joint policy position urging the United States Congress to pass legislation that recognizes the unique vulnerabilities of Southeast Florida to the impacts of climate change".[158] In China, 80 million people live in low-lying areas and are vulnerable to climate change-driven increases in sea level and storm surge.[159]

In the long-term, unmitigated climate change risks causing Greenland and the West Antarctic ice sheet (WAIS) to melt.[160] [161] [162] According to the IPCC: "Near-total deglaciation would eventually lead to a sea-level rise of around 7 m and 5 m from Greenland and the WAIS, respectively, with wide-ranging consequences including a reconfiguration of coastlines worldwide and inundation of low-lying areas, particularly river deltas".[163] It goes on to say that: "Widespread deglaciation would not be reversible except on very long time-scales, if at all". Recent research by the Potsdam Institute for Climate Impact Research, published in the *Proceedings of the National Academy of Sciences*, concluded that for every 1˚C of temperature increase globally, sea levels may rise by 2.3 metres.[164]

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[151] Hallegatte et al., "Future flood losses in major coastal cities".
[152] See also: Moore, *Coastal Flooding Could Cost $1 Trillion By 2050, Vancouver At Risk To Losses: Study*.
[153] The Canadian Press, *Future flooding scenario shows Metro Vancouver at risk*.
[154] Adaptation Sub-Committee *Managing the land in a changing climate*, p.11.
[155] Department for Food, Environment, and Rural Affairs, *Departmental Report 2009,* p. 22.
[156] The Economist, *You're going to get wet*.
[157] United States Army Corps of Engineers, *US Army Corps response to Sea Level Rise*.
[158] Broward County, Miami-Dade County, Monroe County, and Palm Beach County, *Southeast Florida Regional Climate Change Compact*.
[159] The Economist, *China and the environment: The East is grey*, p. 19.
[160] See: Goelzer et al., "Sensitivity of Greenland ice sheet projections to model formulations".
[161] ScienceDaily, *Contribution of Greenland Ice Sheet to Sea-Level Rise Will Continue to Increase*.
[162] Nghiem et al., "The extreme melt across the Greenland ice sheet in 2012".
[163] Intergovernmental Panel on Climate Change, *Fourth Assessment Report: Climate Change 2007*, See: "Deglaciation of West Antarctic and Greenland ice sheets" *https://www.ipcc.ch/publications_and_data/ar4/wg2/en/ch19s19-3-5-2.html*.
[164] Levermann et al., "The multimillennial sea-level commitment of global warming".

[165] Sea level rise on this scale would constitute an exceptionally severe social injury — with entire countries like Bangladesh and the Netherlands massively inundated, along with low-lying regions like Florida, New York City, and many of the world's other densely populated areas. The IPCC identifies the "threshold for near-total deglaciation" at 3.2–6.2°C local warming (1.9–4.6°C global warming). This is within the range of warming projections generated by several emission scenarios studied by the IPCC, corresponding to the absence of aggressive mitigation action on the part of governments.[166] Sea level rise also has the potential to be abrupt, heightening the economic and human costs associated. Recent research has concluded that during the last interglacial period ", a critical ice sheet stability threshold was crossed, resulting in the catastrophic collapse of polar ice sheets and substantial sea-level rise".[167] As with many other climate impacts, the faster sea level rise happens the more costly and disruptive it will be.

Storms, floods, and other extreme weather

The Earth's changing climate has led to a notable rise in the number of great natural catastrophes that are driven by climate-related events over the past 25 years.[168] Over the past 10 years, countries around the world have experienced approximately 785 natural catastrophes per year. During 2010 alone, a total of 950 natural catastrophes took place, nine-tenths of which were weather-related events such floods, hurricanes and storms.169 Climate change is likely responsible, at least in part, for the rising frequency and severity of extreme weather events, such as floods, storms and droughts, since warmer temperatures tend to produce more violent weather patterns.[170] According to Environment Canada: "[f]uture warming will be accompanied by other changes, including the amount and distribution of rain, snow, and ice and the risk of extreme weather events such as heat waves, heavy rainfalls and related flooding, dry spells and/or droughts, and forest fires".[171]

The Fourth Assessment Report of the IPCC (2007) asserts that changes in the frequency and intensity of extreme climate events will occur in the future and will likely challenge human and

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[165] See also: Reuters, *Sea levels may rise 2.3 metres per degree of global warming, report s*

[166] Intergovernmental Panel on Climate Change, *Fourth Assessment Report: Climate Change 2007*, See: "Projected climate change and its impacts" *https://www.ipcc.ch/publications_and_data/ar4/syr/en/spms3.html*".

[167] O'Leary et al., "Ice sheet collapse following a prolonged period of stable sea level during the last interglacial", p. 1.

[168] According to Munich Re, weather-related hazards can be described as a "great natural catastrophes" if it results in any one or a combination of the following attributes: i) number of fatalities exceeds 2,000; ii) number of homeless exceeds 200,000; iii) the country's Gross Domestic Product (GDP) severely declines; and/or iv) the country is dependent on international aid

[169] Munich RE, *Overall picture of natural catastrophes in 2010 – Very severe earthquakes and many severe weather events*.

[170] See: Intergovernmental Panel on Climate Change, *Has there been a Change in Extreme Events like Heat Waves, Droughts, Floods and Hurricanes?*

[171] Environment Canada, *Impacts of Climate Change*.

natural systems to a much greater extent than natural changes in weather conditions. These changes include hurricanes[172] [173] [174] and other extreme events including droughts, heat waves, and floods.[175] [176] The IPCC describes risks of extreme weather events as one of five special 'reasons for concern' about climate change, along with risks to unique and threatened systems, the distribution of impacts and vulnerabilities ("those in the weakest economic position are often the most vulnerable to climate change"), aggregate impacts, and risks of large-scale singularities.[177]

Scotland is especially threatened by flooding. The Scottish Environment Protection Agency (SEPA) claims that one in 20 homes and one in 14 businesses in Scotland are at risk of flooding.[178] The IPCC states that increasing temperatures are likely to be accompanied by extreme precipitation. Furthermore, "[…] anthropogenic influence on increasing atmospheric moisture content has been detected. Higher moisture content in the atmosphere would be expected to lead to stronger extreme precipitation as extreme precipitation typically scales with total column moisture if circulation does not change. An observational analysis shows that winter maximum daily precipitation in North America has statistically significant positive correlations with local atmospheric moisture."[179] The IPCC also asserts that "the most evident flood trends appear to be in northern high latitudes, where observed warming trends have been largest."[180]

A further study, which focuses on the UK in its flood-risk assessment, argues that:

> Within the warm conveyor belt of extra-tropical cyclones, atmospheric rivers (ARs) are the key synoptic features which deliver the majority of poleward water vapour transport, and are associated with episodes of heavy and prolonged rainfall. ARs are responsible for many of the largest winter floods in the mid-latitudes resulting in major socioeconomic losses; for example, the loss from United Kingdom (UK) flooding in summer/winter 2012 is estimated to be about $1.6 billion in damages. Given the well-established link between ARs

[172] Knutson and Tuleya, "Impact of CO2 - Induced Warming on Simulated Hurricane Intensity and Precipitation: Sensitivity to the Choice of Climate Model and Convective Parameterization".
[173] See also: Villarini and Vecchi, "Projected Increases in North Atlantic Tropical Cyclone Intensity from CMIP5 Models".
[174] ScienceDaily, *More Intense North Atlantic Tropical Storms Likely in the Future*.
[175] Regarding heat waves, see: Bumbaco, Dello, and Bond, "History of Pacific Northwest Heat Waves: Synoptic Pattern and Trend".
[176] ScienceDaily, *Nighttime Heat Waves Quadruple in Pacific Northwest*.
[177] Intergovernmental Panel on Climate Change, *Fourth Assessment Report: Climate Change 2007*, See: "The long-term perspective" *https://www.ipcc.ch/publications_and_data/ar4/syr/en/spms5.html*".
[178] Department of Food, Environment, and Rural Affairs, *UK Climate Change Risk Assessment: Government Report*, p. 32.
[179] Intergovernmental Panel on Climate Change, *Fourth Assessment Report: Climate Change 2007,* p. 1912.
[180] Intergovernmental Panel on Climate Change, *Fourth Assessment Report: Climate Change 2007,* p. 214.

> and peak river flows for the present day, assessing how ARs could respond under future climate projections is of importance in gauging future impacts from flooding. We show that North Atlantic ARs are projected to become stronger and more numerous in the future scenarios of multiple simulations from five state-of-the-art global climate models (GCMs) in the fifth Climate Model Intercomparison Project (CMIP5). The increased water vapour transport in projected ARs implies a greater risk of higher rainfall totals and therefore larger winter floods in Britain, with increased AR frequency leading to more flood episodes. In the high emissions scenario (RCP8.5) for 2074–2099 there is an approximate doubling of AR frequency in the five GCMs. Our results suggest that the projected change in ARs is predominantly a thermodynamic response to warming resulting from anthropogenic radiative forcing.[181]

The study comes to the conclusion that "[…] under current climate change scenarios, the strongest [atmospheric rivers] are projected to become more intense and-for any given intensity threshold-more frequent, indicating an intensification of precipitation extremes. […] We conclude that peak multi-day precipitation totals associated with extra-tropical cyclones could intensify over Britain, with more frequent and larger winter flood episodes as a result."[182]

In the recent past, the UK experienced a number of severe weather events. Scotland was hit by a severe winter storm in January 2012, which led to power-cuts, cancelled flights, and damaged properties.[183] Later in the same year, heavy rainfall led to serious flooding in England, which caused disruptions of the transport network, damaged thousands of properties, and led to several fatalities.[184] The storms which raged in the UK at the beginning of this year caused severe erosion, in certain areas about seven years of erosion were condensed into two months, with about three meters of cliff lost at certain points (See pictures below). Peter Nixon, director of land for the National Trust, which owns stretches of coastline in the UK, states that "We're expecting more extremes, less predictability, more stormy events, combined with an underlying issue of rising sea levels."[185]

[181] Lavers, Allan, et al, *Future changes in atmospheric rivers and their implications for winter flooding in Britain*, p.1.
[182] Ibid, p.7.
[183] Met Office, *Winter Storms, early January 2012.*
[184] Met Office, *Exceptionally wet weather – November 2012.*
[185] BBC News, *UK storms: Extreme weather caused 'years of erosion'*.

Figure: "More than 9ft (3m) of the cliff at Birling Gap has been lost to the sea this year."[186]

A report from the MET Office on the recent floods and storms in the UK argues that, although the storms of this year were exceptional and record-breaking, "there is an increasing body of evidence that extreme rainfall rates are becoming more intense, and that the rate of increase is consistent with what is expected from fundamental physics. There is no evidence to counter the basic premise that a warmer world will lead to more intense daily and hourly heavy rain events." [187] With an influx of extreme weather come mounting costs for dealing with such events. The damages caused by flooding in 2012 cost insurers £1.19 billion, floods in 2007 cost £3 billon, which is clearly above the annual average of £18,200.[188] The flooding of 2014 is expected to cost at least £1 billion.[189]

[186] Ibid.
[187] Met Office, Centre for Ecology & Hydrology, *The recent storms and floods in the UK*, p.3.
[188] BBC News, *Flooding payout broke £1bn in 2012, says ABI.*
[189] Osborne, *UK flood clean-up costs could hit £1bn, insurance expert warns*.

A study by the CCRA determined the key risks posed by climate change to the energy sector of the UK. These are a significant risk of energy infrastructure through flooding and heat damages or disruptions, as well as increased energy demand for cooling and increased water demand for energy generation.[190] A further study identified how climate change may have an effect of energy distribution systems. It found that the main risks were increased temperatures, as well as severe weather, especially flooding and storms, both of which could damage substations and cause disruptions of energy supply for customers of up to weeks of months in the worst case.[191]As the damage from climate change mounts, the ability of individuals and firms to mitigate the risk through insurance may diminish. The Association of British Insurers "[…] notes that claims from storm and flood damages in the UK doubled to over £6 billion over the period 1998-2003 with the prospect of a further tripling by 2050."[192]

A 2014 study by Jongman et al on the stresses floods pose on finance, found that "recent major flood disasters have shown that single extreme events can affect multiple countries simultaneously, which puts high pressure on trans-national risk reduction and risk transfer mechanisms. […] Here we show that extreme discharges are strongly correlated across European river basins. We present probabilistic trends in continental flood risk, and demonstrate that observed extreme flood losses could more than double in frequency by 2050 under future climate change and socio-economic development." [193] The study warns further that "rising flood losses already force insurance companies to increase their capital base and may lead to more years of below-zero profitability. Uninsured risks are a growing concern, as a lack of financial means for relief, recovery and reconstruction negatively affects the wellbeing of people, the economy and a country's budget."[194]

The report 'Social justice and the future of flood insurance' by the Joseph Rowntree foundation argues that "catastrophic flooding events have become increasingly frequent in the UK and, with climate change, are likely to become more frequent in the future." [195] It goes on to say:

> Future policy on flood insurance has become a pressing issue. The frequency and intensity of flooding in the UK has increased and can be expected to increase further with

[190] Department of Food, Environment, and Rural Affairs, *UK Climate Change Risk Assessment: Government Report,* p.28.
[191] PricewaterhouseCoopers LLP, *Adapting to climate change in the infrastructure sectors,* p.50.
[192] Department of Food, Environment, and Rural Affairs, *Departmental Report 2009*, p.15.
[193] Jongman, Hochrainer-Stigler, et al, *Increasing stress on disaster-risk finance due to large floods*, p.1.
[194] Ibid.
[195] O'Neill, O'Neill, *Social justice and the future of flood insurance*, p.1.

climate change. […] In contrast to the systems of flood insurance and compensation that operate in Europe and the United States, flood insurance in the UK is peculiar in having a purely market-based approach to insurance in which risk is reflected in the premiums paid and borne by individual households. However, if left to the market, with the increasing ability of insurers to differentiate between households of different levels of risk, this cross-subsidisation is likely to fall. This will leave many low-income households effectively uninsurable, with the consequent threat of many neighbourhoods suffering from severe social blight.[196]

A 2013 report from the World Meteorological Organization (WMO) described the impacts of climate change on extreme weather around the globe, concluding that "[w]hile climate scientists believe that it is not yet possible to attribute individual extremes to climate change, they increasingly conclude that many recent events would have occurred in a different way — or would not have occurred at all — in the absence of climate change".[197] [198] [199] WMO Secretary-General Michel Jarraud explained: WMO's report shows that global warming was significant from 1971 to 2010 and that the decadal rate of increase between 1991–2000 and 2001–2010 was unprecedented.

Increased Risks to Human Health

The impact of climate change on human health is no longer a contested issue, with major national and international organizations like the World Health Organization (WHO), Health Canada, the Centres for Disease Control and Prevention (CDC), and others recognizing both its existing impacts and its future risks. The WHO asserts that "the health effects of a rapidly changing climate are likely to be overwhelmingly negative, particularly in the poorest communities, which have contributed least to greenhouse gas emissions" and acknowledges the increasingly damaging impact of an ever-warmer climate on numerous social and environmental health determinants, including clean air, water, food, and shelter.[200] [201][202]

The negative effects of climate change on human health can be traced back almost forty years. For example, a 2009 WHO report entitled *Global health risks: Mortality and Burden of Disease Attributable to Selected Major Risks* found that since the 1970s climate change has

[196] Ibid., p.2.
[197] World Meteorological Organization, *The Global Climate 2001–2010: A Decade of Climate Extremes*, p. 15.
[198] See also: Harrabin, *Climate extremes are 'unprecedented'*.
[199] *Doyle, World suffered unprecedented climate extremes in past decade — WMO.*
[200] *World Health Organization, Climate and health: Fact sheet, July 2005.*
[201] See also: McMicheal, Woodruff, and Hales, "Climate change and human health: present and future risks
[202] See also: Jesdale, Morello-Frosch, and Cushing, "The Racial/Ethnic Distribution of Heat Risk–Related Land Cover in Relation to Residential Segregation", p. 811-7.

contributed to diarrhoea, flood injury, malaria, undernutrition, and related disease outcomes.[203] The report explains that: Potential risks to health include deaths from thermal extremes and weather disasters, vector-borne diseases, a higher incidence of food-related and waterborne infections, photochemical air pollutants and conflict over depleted natural resources. Climate change will have the greatest effect on health in societies with scarce resources, little technology and frail infrastructure. Only some of the many potential effects were fully quantifiable; for example, the effects of more frequent and extreme storms were excluded. Climate change was estimated to be already responsible for 3 percent of diarrhoea, 3 percent of malaria and 3.8 percent of dengue fever deaths worldwide in 2004. Total attributable mortality was about 0.2 percent of deaths in 2004; of these, 85 percent were child deaths. In addition, increased temperatures hastened as many as 12 000 additional deaths; however these deaths were not included in the totals because the years of life lost by these individuals were uncertain, and possibly brief.[204]

The WHO also claims that global warming has been causing 140,000 deaths per year since 2004.[205] A more recent study commissioned by 20 governments around the world estimates that this number has grown to approximately 400,000 climate-related deaths per year. The report finds that "[c]limate change has already held back global development; it is already a significant cost to the global economy".[206] The report also explains that: "Continuing today's patterns of carbon-intensive energy use is estimated, together with climate change, to cause 6 million deaths per year by 2030, close to 700,000 of which would be due to climate change. This implies that a combined climatecarbon crisis is estimated to claim 100 million lives between now and the end of the next decade".[207] According to a Health Canada assessment, the most significant impacts to human health driven by changes in climate are linked to temperature stress, extreme weather, rodent- and water-borne diseases, ultraviolet radiation, and air pollution.[208] [209] The report describes how "the economic costs of extreme events in this country are rapidly increasing, as is the number of people affected by natural disasters" and that "[s]uch events and other climate-related hazards (e.g. smog, food-, water-, vector- and rodentborne diseases) continue to pose significant short- and long-term

[203] World Health Organization, *Global health risks: Mortality and Burden of Disease Attributable to Selected Major Risks*, p. 44
[204] World Health Organization, *Global health risks: Mortality and Burden of Disease Attributable to Selected Major Risks*, p. 24.
[205] World Health Organization, *Climate change and health*.
[206] DARA International, *Climate Vulnerability Monitor: A Guide to the Cold Calculus of A Hot Planet*, p. 16.
[207] Ibid., p. 17
[208] Health Canada, *Human Health in a Changing Climate: A Canadian Assessment of Vulnerabilities and Adaptive Capacity*
[209] Notably, this is one of many climate science reports produced by Canadian civil servants and essentially 'buried' by the government of Stephen Harper. Planned coast-to-coast press conferences were cancelled, the report was released without publicity, and the report is not available through the Health Canada website.

risks to the health and well-being of Canadians and their communities".[210]

Climate change is expected to worsen the impact of toxic air pollution on human health. Research published in 2013 in *Climatic Change* concluded that climate change will worsen the impacts from both fine particulate matter and ozone. These impacts are expected to be especially severe in highly populated regions of East Asia, South Asia, and North America. By applying epidemiological concentration-response relationships, the researchers estimated that these effects will cause 100,000 annual premature deaths of results worldwide.[211] [212] The researchers conclude that simply to maintain current air quality standards in a world that has experienced projected levels of climate change it will be necessary to implement stronger emission controls on toxic pollutants.

It is generally accepted that the greatest impacts of continuing climate change will be felt by people in low-income countries, as regions with weak health or governmental infrastructure will not have the capacity to respond to consequences of climate change appropriately. Particularly hard hit will be children, the elderly, people with illnesses or infirmities, and people with pre-existing medical conditions. The WHO also claims that: "Many of the major killers such as diarrhoeal diseases, malnutrition, malaria and dengue are highly climate-sensitive and are expected to worsen as the climate changes". [213] Also, a growing body of literature is drawing attention to the incommensurate impacts of climate change on vulnerable and marginalized populations.[214] [215]
Rich parts of the world are also vulnerable to health effects from climate change. The City of New York estimates that hotter summers in the 2020s "could cause an estimated 30 to 70 percent increase in heat-related deaths, or about 110 to 260 additional heat- related deaths per year on average in New York City compared to the baseline period for the analysis (1998–2002)".[216]
According to the Australian government's Climate Commission: "Heat causes more deaths than any other type of extreme weather event in Australia. Increasing intensity and frequency of extreme heat poses health risks for Australians and can put additional pressure on health services. Changes in temperature and rainfall may allow mosquito-borne illness like dengue fever to spread south".[217]
In Europe, a working commission of the European Union determined that human health will be

[210] Health Canada, *Human Health in a Changing Climate: A Canadian Assessment of Vulnerabilities and Adaptive Capacity*, p. 432.
[211] Fang et al., "Impacts of 21st century climate change on global air pollution-related premature mortality".
[212] See also: ScienceDaily, *Air Pollution Worsened by Climate Change Set to Be More Potent Killer in the 21st Century*.
[213] World Health Organization, *Climate change and health*.
[214] Costello et al., "Managing the health effects of climate change", p. 1693–1733.
[215] World Health Organization, *Closing the gap in a generation: Health equity through action on the social determinants of health*.
[216] The City of New York, *A Stronger, More Resilient New York*, p. 31.
[217] Government of Australia Climate Commission, *The Critical Decade 2013*, p. 4.

affected by climate change, on the one hand, directly via heat and cold and, on the other hand, indirectly, through flooding and by creating conditions in which food or vector-borne diseases may be transmitted more easily. It is also estimated that, in EU countries, mortality will increase by 1-4 percent for each one-degree rise in temperature.[218] This complies with the findings of studies in the UK, where the Department for Environment, Food, and Rural Affairs (Defra) found that an estimated 2000 people died in the UK in the summer of 2003, which was 2°*C* hotter that the 1961-1990 average, while heat waves during summer are expected to increase in frequency.[219]

Further research describes the various ways in which climate change will affect the health of UK citizens. Increased temperatures and ozone levels, connected to increased summer air pollutions, will lead to a higher mortality rate. The number of deaths and injuries is also likely to rise due to flooding, while the rising temperature of the sea, combined with changing patterns in rainfall may lead to the development of water, vector, and food borne diseases. All these factors combined are predicted to lead to rising costs for emergency services and a higher mortality rate.[220]

Ecosystem collapse

Climate change is expected to have a substantial effect on ecosystems and biodiversity around the world.[221] Writing in *Nature Climate Change*, a group of researchers concluded that "without mitigation, large range contractions can be expected even amongst common and widespread species, amounting to a substantial global reduction in biodiversity and ecosystem services by the end of this century".[222] Because ecosystems are vital to the survival and prosperity of humanity, climatic damage imposed on them is an important form of social injury arising from the activities of fossil fuel companies. As emphasized by the United Nations Development Programme, the link between ecosystem integrity and prosperity is especially important for the poor: "Climate change is already exacerbating chronic environmental threats, and ecosystem losses are constraining livelihood opportunities, especially for poor people".[223]

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[218] European Union: Commission Staff Working Document, Accompanying document to the White Paper 'Adapting to climate change: Towards a European framework for action': *Human, Animal and Plant Health Impacts of Climate Change* , p.4- 5.
[219] Department for Food, Environment, and Rural Affairs, *Departmental Report 2009,* p.15.
[220] Department for Food, Environment, and Rural Affairs, *UK Climate Change Risk Assessment: Government Report,* p. 24.
[221] Foden et al., "Identifying the World's Most Climate Change Vulnerable Species: A Systematic Trait-Based Assessment of all Birds, Amphibians and Corals", p. 1.
[222] Warren et al., *Quantifying the benefit of early climate change mitigation in avoiding biodiversity loss*, p. 1.
[223] United Nations Development Programme, *Human Development Report 2013: The Rise of the South: Human Progress in a Diverse World*, p. 95.

Salmon are one example of an important species that faces threats from climate change. The dangers climate change poses to salmon are illustrative for a number of reasons: salmon fisheries in particular are significant contributors to the global economy and to the subsistence of large segments of the world's population; and salmon play an important role in the functioning of their marine ecosystems. A report from the International Union for Conservation of Nature (IUCN) states that the salmon fishing industry contributed more than US$2 billion to economies in Russia, Japan, the U.S., and Canada and directly employed more than 35,000 people.[224] Reliance on salmon fisheries as both a source of food and income is especially important to communities along Canada's Atlantic and Pacific coasts.

In 2009, the IUCN released the "Red List of Threatened Species: More Than Just the Polar Bear", highlighting the need to more closely study the complex risks associated with climate change to delicate ecosystems and the species that inhabit them.[225] The report includes a detailed discussion of the problems that increasing global temperatures will pose to the safety of the world's salmon populations. Salmon provide food for a suite of predators and scavengers that live along the coasts of the ocean and beside the banks of streams and rivers that the fish traverse as part of their extensive migratory routes. Seals, whales, otters, bears, birds, and many invertebrates rely on salmon as a vital source of protein and fat, often at critical stages in their own yearly feeding cycles. Furthermore, throughout a salmon's life cycle, it will transport essential nutrients from saltwater to freshwater areas as well as to the surrounding lands via the excretion of waste as well as through the decay of carcasses.

Increases in water temperatures concurrent with rises in global air temperatures impose a number of negative effects on salmon. Direct biological impacts include increased physiological stress, susceptibility and exposure to disease, and challenges and disruptions to breeding. These effects on the biology of salmon may potentially lead to impacts in the long-term. For example, because the development of salmon relies on water temperature, warmer waters could result in early migration of juvenile fish. Because natural patterns are timed with other important feeding phenomena such as planktonic blooms, early migrations could mean an insufficient source of food for salmon entering the oceans at a critical point in their development. Similarly, flows of warm freshwater can create thermal barriers to migrating salmon, requiring additional energy to navigate. Such barriers can also delay or even prevent spawning altogether. Moreover, increased winter flows can damage river beds, as well as the nests of salmon eggs dug into the sediment and gravel.

[224] International Union for Conservation of Nature, *Salmon and Climate Change: Fish in Hot Water*, p. 2.
[225] International Union for Conservation of Nature, *Species and Climate Change: More than Just the Polar Bear*.

Warmer ocean temperatures have also been shown to reduce the abundance of other smaller fish in areas experiencing an influx of new warmer waters.

These developments will be significant for Scotland as well. Salmon is an important factor in the Scottish economy, being Scotland's number one food export, and having a worldwide retail value of £1 billion annually, and thus many jobs attached to it.[226]

According to the National Ecosystem Assessment of the UK, climate change has already "appeared to have affected river biodiversity; for example, populations of trout and salmon have declined by about 50%-60% in some UK catchments, which has been linked to the 1.5℃ rise in some river temperatures that has occurred since 1980." [227] Moreover, climate change and human activities like fishing and pollution are causing the further deterioration of many marine habitats.[228]

Because the interaction of the multitude of biological factors that play a role in maintaining the balance of healthy ecosystems, scientists are hard-pressed to provide specific predictions, let alone detail recommendations for large-scale strategies to deal with potential climate-related threats for an increasing range of at-risk species. Acceleration of climate change will exacerbate these difficulties, and can have profound environmental as well as economic impacts. The only sure means of maintaining the health of terrestrial and aquatic ecosystems is to significantly mitigate the release of GHG emissions into the atmosphere.

At the same time as they increase global temperatures, heightened CO2 concentrations in the atmosphere cause the oceans to become more acidic. According to the IPCC, this is "expected to have negative impacts on marine shell-forming organisms (e.g. corals) and their dependent species".[229] The IPCC also expects ocean acidification to be part of a suite of changes that that makes it "likely" that "[t]he resilience of many ecosystems" will be "exceeded this century".[230] A 2010 report from the United Nations Environment Programme (UNEP) concluded that: "[i]f ocean acidification continues disruptions to food chains and direct and indirect impacts on numerous species are considered likely with consequent risk to food security".[231] [232] The report suggests that: "[t]he obvious solution to the potential threats posed by ocean acidification is to make rapid and

[226] Scottish Salmon Producers' Organisation (SSPO), *Facts & Figures.*
[227] UK National Ecosystem Assessment, S*ynthesis of Key Findings,* p. 30.
[228] UK National Ecosystem Assessment, S*ynthesis of Key Findings,* p. 64.
[229] Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report*, p. 52.
[230] Ibid., p. 48.
[231] United Nations Environment Programme, *Environmental Consequences of Ocean Acidification: A Threat to Food Security*, p. 8.
[232] See also: Morello, *Ocean Acidification Threatens Global Fisheries*.

substantial cuts to anthropogenic CO2 emissions to the atmosphere".[233] Canada's Department of Fisheries and Oceans has also highlighted the danger of ocean acidification. In a 2013 report, they attribute the phenomenon's "unprecedented rate of occurrence" to "the significant amount of carbon dioxide that has been added to the atmosphere over the past 250 years".[234] They further explain that:

> The potential effects of ocean acidification include altered seawater chemistry; decreased growth and productivity of calcium carbonate-based organisms; changes in respiration in large invertebrates, fish, and some zooplankton; increased growth of certain seaweeds and sea grass; changes in species composition and dominance; societal and economic impacts; and other potential impacts that presently remain unknown.[235]

The report describes biophysical impacts on nutrients and toxicity, marine organisms, benthic invertebrates, marine fish, seaweed and sea grade, and ecosystem structure and function, along with socioeconomic impacts on marine fisheries and marine aquaculture. [236] Because of both warming and the acidification of the world's oceans in response to rising CO2 concentrations, coral reefs are especially vulnerable to climate change.[237] In their Fourth Assessment Report, the IPCC concluded that increased coral bleaching would accompany warming of 1˚C, most corals will be bleached above 1˚C, and "widespread coral mortality" is expected above 2.5˚C.[238] Significant damage to coral reefs has already been observed, including the loss of 50.7 percent of initial coral cover in Australia's Great Barrier Reef.[239] Caribbean corals are also experiencing record thermal stress, bleaching, and mortality.[240] An article in *Science* explains that: "Atmospheric carbon dioxide concentration is expected to exceed 500 parts per million... by 2050 to 2100, values that significantly exceed those of at least the past 420,000 years during which most extant marine organisms evolved".[241] It concludes that: "[t]he result will be less diverse reef communities and carbonate reef structures that fail to be maintained".[242] As exceptionally rich ecosystems, coral reefs have an importance that goes beyond their inherent biological value. Ecosystem services provided by coral reefs, including food, jobs, and tourism, have an estimated value of as much as US$375

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[233] United Nations Environment Programme, *Environmental Consequences of Ocean Acidification: A Threat to Food Security*, p. 8.
[234] Fisheries and Oceans Canada, *Ocean Acidification: State of the Scotian Shelf Report*, p. 4.
[235] Fisheries and Oceans Canada, *Ocean Acidification: State of the Scotian Shelf Report*, p. 6.
[236] Ibid., p. 13.
[237] ScienceDaily, *Major Changes Needed for Coral Reef Survival*.
[238] Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report*, p.51.
[239] De'ath et al., "The 27–year decline of coral cover on the Great Barrier Reef and its causes".
[240] Eakin et al., "Caribbean Corals in Crisis: Record Thermal Stress, Bleaching, and Mortality in 2005".
[241] Hoegh-Guldberg et al., "Coral Reefs Under Rapid Climate Change and Ocean Acidification", p. 1737–1742.
[242] Ibid., p. 1737–1742.

billion per year.[243]

Many other species are expected to experience negative impacts from climate change. For instance, reductions in sea ice "will drastically shrink marine habitat for polar bears, ice-inhabiting seals, and some seabirds, pushing some species toward extinction" while "caribou/reindeer and other land animals are likely to be increasingly stressed as climate change alters their access to food sources, breeding grounds, and historic migration routes".[244, 245, 246] One 2013 study found that "608–851 bird (6–9 percent), 670–933 amphibian (11–15 percent), and 47–73 coral species (6–9 percent)" are "highly climate change vulnerable".[247] A 2013 study from BirdLife International found that "[c]limate change is already affecting birds in diverse ways", and that "[m]any species will suffer from range shifts and losses, and some will become extinct" as a result.[248, 249] The report also highlights how the risks to birds increase as temperature increase exceeds 2˚C: "[t]emperature rises beyond this level are predicted to lead to catastrophic extinction rates, with few management options".[250]

An Environment Canada briefing released under the *Access to Information Act* argues that "[h]ealthy and resilient ecosystems are one of our best defences against a changing climate".[251] The document identifies climate change as one of "several major threats" that are causing "significant biodiversity loss". Considerable scope exists for reducing the degree of ecosystem damage resulting from climate change by reducing future GHG pollution. The article in *Nature Climate Change* concludes that: "without mitigation, 57- 6 percent of plants and 34-7 percent of animals are likely to lose ~50 percent of their present climatic range by the 2080s. With mitigation, however, losses are reduced by 60 percent if emissions peak in 2016 or 40 percent if emissions peak in 2030".[252]

Threats to the infrastructure of cities, including Glasgow

More than half the world's population live in cities and urban areas. As a first step towards addressing climate change, many cities have conducted assessments of their GHG emissions, as

[243] National Oceanic and Atmospheric Administration, *Heat Stress to Caribbean Corals in 2005 Worst on Record*.
[244] International Arctic Science Committee, *Arctic Climate Impact Assessment*, Executive summary, p. 10.
[245] See also: Post et al., "Ecological Consequences of Sea-Ice Decline".
[246] Weber, *We're losing all the things that life depends on: Melting Arctic sea ice has led to mass mortality events, study says*.
[247] Foden et al., "Identifying the World's Most Climate Change Vulnerable Species: A Systematic Trait-Based Assessment of all Birds, Amphibians and Corals", p. 1.
[248] BirdLife International, *State of the World's Birds: Indicators for our changing world*, p. 15.
[249] See also: Paris, *1 in 8 bird species threatened with extinction*.
[250] BirdLife International, *Human-induced climate change may pose the greatest challenge*.
[251] De Souza, *Major threats to biodiversity loom on Canadian economy: federal briefings*.
[252] Warren et al., *Quantifying the benefit of early climate change mitigation in avoiding biodiversity loss*.

well as begun to evaluate their vulnerability to climate change impacts. The City of New York projects that — because of rising sea levels and ocean temperatures — by 2050 "a storm like [Hurricane Sandy could cause an estimated $90 billion in losses (in current dollars) — almost five times as much".[253]

In the UK, the CCRA has evaluated how climate change is expected to influence buildings and infrastructure. Rising temperatures and changes in precipitation levels are likely to cause many hazards. Energy infrastructures are threatened by flooding and disruptions caused by heat, while the demand (for cooling) is likely to increase due to rising temperatures. Roads and railways are under threat by flooding. Rising temperatures will cause supply-demand deficits in water supply. Furthermore, buildings – private and public - are at risk of being damaged by flooding and coastal erosion and of being exposed to overheating. [254]

In 2004, an assessment of GHG emissions of Glasgow and the Clyde Valley was made, concluding that, in 2004, the area "[...] emitted a total of 12.54 million tonnes of greenhouse gases, compared to Scotland emissions of 55.7 million tonnes and UK emissions of 657 tonnes."[255] Carbon dioxide accounted for 97% of these emissions.[256] The Scottish government and the City of Glasgow have started several programmes to address these issues. In the Climate Change (Scotland) Act passed in 2009, the Scottish government set (GHG) emission reduction targets. The final goal is a reduction of 80 percent until 2050; the interim goal is a reduction of 42 percent until 2020.257
A further programme for carbon emission reductions is *Sustainable Glasgow*, an initiative by the Glasgow City Council, the University of Strathclyde, and others, to make Glasgow "one of Europe's most sustainable cities,"[258] and to reduce carbon emissions to meet Glasgow 2020 and 2050 goals of emission reductions.[259]

Impacts of climate change are already being felt in Glasgow, with a temperature increase of 1℃ in Scotland, in all seasons. The future trends are hotter, drier summers and warmer, wetter winters and intensified rainfalls.[260] Furthermore, the Clyde and Loch Lomond area have the greatest

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[253] The City of New York, *A Stronger, More Resilient New York*, Foreward, p. 2.
[254] Department of Food, Environment, and Rural Affairs, *UK Climate Change Risk Assessment: Government Report* , p. 29.
[255] Glasgow and the Clyde Valley Structure Plan Joint Committee, *Glasgow and the Clyde Valley Greenhouse Gas Inventory,* p.2.
[256] Ibid.
[257] Scottish Government. *Climate Change Scotland (2009) Act.*
[258] Sustainable Glasgow, *Sustainable Glasgow Report 2010,* p.28
[259] Ibid.
[260] Joseph Hagg, *Glasgow's changing climate.*

number of properties at the risk of flooding. 92 percent of all Scottish properties lie within Potentially Vulnerable Areas, which indicates how important it is for Glasgow and Scotland as a whole to prepare for climate change and try to mitigate it as much as possible.[261]

Increased Financial Burdens on the City

High density cities such as Glasgow are particularly susceptible to damage caused by extreme weather or natural disasters. Extreme weather events driven by climate change can be costly for municipalities in terms of lives lost and damage to cultural assets, as well as financially. For instance, flooding in 2002 in Glasgow cost the city millions of pounds.[262] Since then, a flood prevention scheme has been established at the cost of £53 million. These expenses are significant, but they are still less than the estimated £100 million which would occur without these protection measures.[263] Nevertheless, recent events such as Hurricane Sandy and the floods in Somerset have revealed that even developed countries can experience substantial injury from extreme weather events that are difficult to prepare for, and which can be unprecedented in strength and geographic scope.

Increased health risks to vulnerable populations

Severe storms and extreme weather can be very costly, which is problematic in relation to health equity, since people with lower income are already more likely to suffer poor health. Health inequality in Scotland is already severe. Life expectancy for men in the most deprived areas drops about ten years, compared with life expectancy in the least deprived areas.[264] People in the most deprived areas suffer poorer health and lower life expectancy, due to deprivation and all the factors accompanying it, like poor housing.[265] These inequalities could be exacerbated if they are connected to increased costs through climate change, like damaged properties.

It is widely documented that certain populations in a particular city are more vulnerable to the adverse effects of climate change than others.[266] [267] [268] [269] 'Vulnerability' in this sense can be defined as "the degree to which individuals and systems are susceptible to or unable to cope with

[261] SEPA (Scottish Environment Protection Agency) *The National Flood Risk Assessment.*
[262] BBC News, *Floods cost into 'millions'.*
[263] Glasgow City Council, *Glasgow flood prevention scheme inaugurated.*
[264] Audit Scotland, *Health Inequalities in Scotland,* p.2.
[265] Ibid.
[266] Ebi, "Facilitating Climate Justice through Community-Based Adaptation in the Health Sector".
[267] McKeown, *Hot Weather Response Plan - Update*.
[268] Marmot, "Achieving health equity: from root causes to fair outcomes", p. 1153–1163.
[269] Public Health Agency of Canada, *Reducing Health Disparities - Roles of the Health Sector: Discussion Paper*.

the adverse effects of climate change".[270] Determinants of health, such as income and social status, education and literacy, social and physical environments, or genetics, etc., can be used to assess a population's vulnerability to the various impacts of climate change. For example, severe storm events can affect physical environments by causing extensive property damage; challenges linked with income and social status can be reinforced as people with inadequate employment or insufficient funds could have more difficulty acquiring financial resources to repair property, deal with displacement, or finance interim accommodation. [271]

The current and forecasted future composition of Glasgow's population is as follows: in 2010, the size of Glasgow's population was 593,000. The number of people aged 65+ was about 80,000 – this number is expected to increase by 2035 to 120,000,[272] which concurs with data for the UK as a whole, which predicts the fast growth in in the proportion of elderly people.[273]

This may lead to problems, since the elderly are a social group especially vulnerable to effects of climate change, as, for instance, research conducted by the EU found. It concluded that:

> […] overall health effects of climate change should be unevenly distributed across the regions of Europe. Since health and wellbeing are also strongly related to socio-economic drivers such as income, housing, employment, education, gender and lifestyle, the impact of climate change should alter health inequalities within and between countries, and lead to uneven distribution and additional burdens for lower income groups and certain vulnerable groups, such as children, those working outdoors, the elderly, women, and people with a pre-existing illness. As an example, current heat related mortality has been shown to reveal a strong socio-economic dependence. For some effects, e.g. mortality related heat and to air pollution, the elderly are far more vulnerable, and there may be additional factors affecting this group which are linked to socio-economic status.[274]

Abrupt and non-linear adverse climate impacts

The Earth's climate system includes some powerful positive feedback mechanisms capable of multiplying the climatealtering effect of GHGs. For instance, tropical ecosystems can generate

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[270] The Clean Air Partnership, *Climate Change Adaptation and Health Equity: Background Report*, p. 6.
[271] Ibid.
[272] Glasgow City Council, *People and Housegolds in Glasgow. Current Estimates and Projected Changes 2010-2035. Demographic Change in Glasgow City and Neighbourhoods.*
[273] Richard Cracknell, *The ageing population, in: House of Commons Library Research (2010)*.
[274] European Union: Commission Staff Working Document, Accompanying document to the White Paper 'Adapting to climate change: Towards a European framework for action': *Human, Animal and Plant Health Impacts of Climate Change*, p. 7

significant quantities of CO2 when temperatures rise.[275] [276] Another positive feedback is how melting ice decreases the planet's albedo (reflectiveness), causing more of the sun's energy to be directed toward increasing temperatures. Other feedback mechanisms include the release of methane — a powerful GHG — from melting permafrost and subsea methane clathrate deposits.[277] [278] [279] These large methane deposits would add substantially to global temperature increase if released abruptly. Abrupt methane release has been associated with past instances of abrupt global warming, such as during the Paleocene–Eocene Thermal Maximum 55 million years ago, and several of these instances were accompanied by major global extinction events both on land and in the oceans.[280] According to NASA: Over hundreds of millennia, Arctic permafrost soils have accumulated vast stores of organic carbon — an estimated 1,400 to 1,850 petagrams of it (a petagram is 2.2 trillion pounds, or 1 billion metric tons). That's about half of all the estimated organic carbon stored in Earth's soils. In comparison, about 350 petagrams of carbon have been emitted from all fossil-fuel combustion and human activities since 1850.

Most of this carbon is located in thaw-vulnerable topsoils within 10 feet (3 meters) of the surface.[281] NASA also explains that: "Permafrost soils are warming even faster than Arctic air temperatures ... 1.5 to 2.5 degrees Celsius in just the past 30 years" and that this warming "threatens to mobilize these organic carbon reservoirs and release them into the atmosphere as carbon dioxide and methane, upsetting the Arctic's carbon balance and greatly exacerbating global warming".[282], [283, 284, 285] Several potentially dangerous 'tipping points' have been identified by scientists, including the danger that the themohaline circulation (which produces Europe's relatively warm climate relative to its latitude) may be disrupted, though this is now considered unlikely, at least within the next century.[286] Writing in *Nature* in 2009, Johan Rockstrom et al. explain that:

> We propose that human changes to atmospheric CO2 concentrations should not exceed 350 parts per million by volume, and that radiative forcing should not exceed 1 watt per square metre above preindustrial levels. Transgressing these boundaries will increase the risk

[275] Wang et al., "Variations in atmospheric CO2 growth rates coupled with tropical temperature".
[276] See also: ScienceDaily, *Tropical Ecosystems Boost Carbon Dioxide as Temperatures Rises*.
[277] See: Whiteman, Hope, and Wadhams, "Vast costs of Arctic change".
[278] See also: Levy et al., "Accelerated thermokarst formation in the McMurdo Dry Valleys, Antarctica".
[279] See also: Vidal, *Rapid Arctic thawing could be economic timebomb, scientists say*.
[280] See: Hansen, *Storms of My Grandchildren*.
[281] United States National Aeronautics and Space Administration, *Is a Sleeping Climate Giant Stirring in the Arctic?*
[282] Ibid.
[283] See also: Vaks et al., "Speleothems Reveal 500,000-Year History of Siberian Permafrost", p. 183–6.
[284] Harvey, *1.5C rise in temperature enough to start permafrost melt, scientists warn*.
[285] Bakewell, *Arctic Ice-Melt Cost Seen Equal to Year of World Economic Output*.
[286] Intergovernmental Panel on Climate Change, *Thermohaline circulation changes in the North Atlantic: possible impacts for Europe*.

of irreversible climate change, such as the loss of major ice sheets, accelerated sea level rise and abrupt shifts in forest and agricultural systems. Current CO2 concentration stands at 387 p.p.m.v. and the change in radiative forcing is 1.5 W *m*−2.[287]

In their Fourth Assessment Report, the IPCC explains that "[a]nthropogenic warming could lead to some impacts that are abrupt or irreversible", including "metres of sea level rise", "significant extinctions" (40 to 70 percent of species assessed if warming exceeds 3.5˚C), and "[c]hanges in terrestrial and ocean CO2 uptake [that] may feed back on the climate system".[288] The climate system has experienced dramatic changes in the past, such as the Permian–Triassic extinction event. This event, which took place 252 million years ago, saw 96 percent of marine species and 70 percent of terrestrial species become extinct, and took as long as 10 million years to recover from.[289] Possibly caused by volcanism, this event involved "global warming by 6˚C and huge input of light carbon into the ocean-atmosphere system" and "an ever-worsening positive-feedback loop, the 'runaway greenhouse"'.[290] It is possible that human GHG pollution on a significant scale could induce massive additional GHG release as permafrost and clathrates melt, and as forests dry out and burn. A severely amplified anthropogenic greenhouse effect could pose a significant danger to human civilization and many forms of life on Earth. The planet Venus may have experienced a 'runaway' climate change scenario. Beginning in a state where liquid water existed on its surface, as the result of the sun growing brighter over long periods of time Venus experienced an accumulation of water vapour and CO2 in its atmosphere.[291] Now the surface of the planet has an average temperature of 462˚C. NASA climatologist James Hansen has suggested that the Earth could experience a runaway greenhouse effect and adopt a climate like that of Venus if fossil-fuel use continues until reserves are exhausted.[292] Research published in *Nature Geoscience* in July 2013 concluded that the threshold for such runaway warming may be lower than previously estimated.[293]

Security implications

A number of major analyses have assessed the likely global security implications of climate change. In 2008, a National Intelligence Assessment was assembled by 16 U.S. intelligence

[287] Rockstrom et al., "A safe operating space for humanity".
[288] Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report*, p. 53.
[289] Sahney and Benton, "Recovery from the most profound mass extinction of all time", p. 759–765.
[290] Benton and Twitchett, "How to kill (almost) all life: the end-Permian extinction event", p. 358.
[291] Rasool and De Bergh, "The Runway Greenhouse and the Accumulation of CO2 in the Venus Atmosphere".
[292] Hansen, *Climate Threat to the Planet: Implications for Energy Policy and Intergenerational Justice*, p. 22-23.
[293] Goldblatt et al., "Low simulated radiation limit for runaway greenhouse climates".

agencies. Although the report is classified, the chairman stated publicly that climate change could disrupt U.S. access to raw materials, create millions of refugees, and cause water shortages and damage from melting permafrost.[294] A 2003 report commissioned by the Pentagon considered some of the more dramatic possible warming scenarios and concluded that:

> In short, while the US itself will be relatively better off and with more adaptive capacity, it will find itself in a world where Europe will be struggling internally, large number so [sic] refugees washing up on its shores and Asia in serious crisis over food and water. Disruption and conflict will be endemic features of life.[295]

It also argues that: "with inadequate preparation, the result [of abrupt climate change] could be a significant drop in the human carrying capacity of the Earth's environment".[296] A report prepared for the Centre for Naval Analysis— produced by a "blue-ribbon panel of retired admirals and generals from the Army, Navy, Air Force, and Marines" — calls climate change "potentially devastating".[297] A joint report from the Centre for Strategic and International Studies and the Centre for a New American Security describes how current projections from climate models are "too conservative" and that "at higher ranges of the [warming] spectrum, chaos awaits".[298] The report also highlights the need for urgent action to reduce emissions: "An effective response to the challenge of global warming cannot be spread out across the next century, but rather must be set in place in the next decade, in order to have any chance to meaningfully alter the slope of the curves one sees in the IPCC report".[299]

In 2012, the U.S. National Academy of Sciences published a report on: "Climate and Social Stress: Implications for Security Analysis".[300] The report concludes that:

> Anthropogenic climate change can reasonably be expected to increase the frequency and intensity of a variety of potentially disruptive environmental events — slowly at first, but then more quickly. Some of this change is already discernible. Many of these events will

[294] Craven, *What's the Worst That Could Happen?: A Rational Response to the Climate Change Debate*.
[295] Schwartz and Randall, *An Abrupt Climate Change Scenario and Its Implications for United States National Security*, p. 22.
[296] Ibid., p. 1.
[297] Center for Naval Analyses, *National Security and the Threat of Climate Change*, p. 3.
[298] Center for Strategic and International Studies and the Center for a New American Security, *The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change*, p. 78.
[299] Center for Strategic and International Studies and the Center for a New American Security, *The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change*, p. 78.
[300] Steinbruner, Stern, and Husbands, *Climate and Social Stress: Implications for Security Analysis*.

> stress communities, societies, governments, and the globally integrated systems that support human well-being.[301]

And that:

> It is prudent to expect that over the course of a decade some climate events—including single events, conjunctions of events occurring simultaneously or in sequence in particular locations, and events affecting globally integrated systems that provide for human well-being—will produce consequences that exceed the capacity of the affected societies or global systems to manage and that have global security implications serious enough to compel international response. It is also prudent to expect that such consequences will become more common further in the future.[302]

All told, the report describes in great detail the ways in which climate change is a national security issue for the United States, as well as a threat to international peace and security. In March 2013, Admiral Samuel J. Locklear III — the chief of U.S. naval forces in the Pacific — argued that climate change "is probably the most likely thing that is going to happen... that will cripple the security environment, probably more likely than the other scenarios we all often talk about".[303]

A 2013 article published in the journal of the Royal United Services Institute describes how climate change could contribute to global instability by exposing cities to extreme events. It also raises concerns about unforeseen social and political consequences from adaptation and mitigation, as well as the possibility of geoengineering.[304] In a 2010 study conducted by the Canadian Department of National Defence (DND), climate change was identified as one reason why "[t]he maritime domain... will become increasingly contested over the coming years and decades".[305]

In Europe the threat of climate change to security has also been acknowledged by the Council of the European Union, which argues that "climate change is a global environmental and development challenge. Next to the most immediate effects, it also has important security implications since it acts as a 'threat multiplier', exacerbating tensions over land, water, food and energy prices, and creating migratory pressures and desertification. It is a threat to global growth,

301 Steinbruner, Stern, and Husbands, *Climate and Social Stress: Implications for Security Analysis*, p. S-2.
302 Ibid., p. S-4.
303 Bender, *Chief of US Pacific forces calls climate biggest worry*.
304 Dalby, "Climate Change: New Dimensions of Environmental Security".
305 Byers and Webb, *That Sinking Feeling: Canada's Submarine Program Springs a Leak*, p. 25.

prosperity and stability."[306]

3.3 The harm caused is inherent to the primary business of fossil fuel companies

All the social injuries described above are imposed on innocent parties by fossil fuel companies in the course of their fundamental business activity of extracting coal, oil, and gas. These harms are inseparable from the continuation and expansion of these core business activities. According to the Government of the UK, 83 percent of the UK's GHG emissions are carbon dioxide. Of these, 32 percent were caused by businesses – the "emissions from this sector primarily relate to fossil fuel combustion in industry and commerce"[307]

Particularly by funding the construction of long-lasting fossil fuel infrastructure, the University of Glasgow's investments in fossil fuel companies increase the amount of harm that will arise as a result of climate change. Divestment is the only way for the University of Glasgow to avoid contributing financially to the fossil fuel industry, and by extension, to the socially injurious impacts delineated above.

Besides divestment, another approach to socially responsible investment is to try to alter a firm's behaviour by applying pressure through shareholder voice. However, the harmful activities (extracting and selling fossil fuels) are inherent to the primary business of fossil fuels companies in which the university is invested. For example, Shell lists its business activities as follows: the upstream business is to "[…] explore for and extract natural gas […]", its downstream business is to "[…] refine, supply, trade and ship crude oil worldwide and manufacture and market a range of products, and produce petrochemicals for industrial customers."[308] Chevron also, first and foremost, "[…] explores for and produces crude oil and natural gas around the world."[309] BP also lists as its first business activities the finding, extracting, and moving of oil and gas, as well as making and selling fuels and products.[310]

In this sense, investments in fossil fuel companies closely parallel investments in tobacco companies; in both cases, the problem is the primary product being produced by the industry. As a result, shareholder voice is not an effective strategy for mitigating these harms. Given the centrality of oil and natural gas extraction, as well as the refinement and sale of these resources, to the

[306] Council of the European Union (2011) *Council Conclusions on EU Climate Diplomacy*: p.1.
[307] Department of Energy & Climate – Statistical Release (2013) '2012 UK Greenhouse Gas emissions, provisional figures and 2011 UK greenhouse gas emissions, final figures by fuel type and end-user' P. 15.
[308] Shell, *Shell at a glance.*
[309] Chevron, *Exploration and Production*.
[310] BP, *What we do.*

business models of these companies, shareholder voice would be an ineffective way to address the social injury from climate change. Fossil fuel companies could not abandon the socially injurious activity without dissolving their existing business models. Therefore, it would be unreasonable for the University of Glasgow to expect to be able to alter the socially injurious activities of these companies while maintaining its investments in the fossil fuel industry. Divestment is the most appropriate response for the University of Glasgow to adopt in order to eliminate any financial complicity in the fossil fuels industry's socially injurious activities.

3.4 The business activities of these companies frustrate the enforcement of the rules of domestic and international law intended to protect individuals against deprivation of health, safety, and basic freedoms

The socially injurious activities of fossil fuel companies frustrate the enforcement of rules of domestic and international law intended to protect individuals against deprivation of health, safety and basic freedoms. This includes the violation of specific domestic and international statutes, the violation of common law duties through the creation of nuisance, and the frustration of international diplomatic efforts to address climate change. Effective climate change policies will need to remain in place for decades while global emissions fall. In order to protect individuals against the harms it will cause, policy-makers must pre-commit themselves to mitigation efforts in ways that are hard to undo in the future.[311] Fossil fuel companies have been active in preventing the emergence of such policies and meaningful constraints.

A limited recognition of the seriousness of climate change can be found in some legal decisions from the United Kingdom. For instance, in 2008 jurors decided that damage caused to the Kingsnorth power station in Kent by protesting climate change activists was justifiable in light of the amount of environmental damage being done by the power plant.[312] During the trial, the jurors heard testimony from NASA climatologist James Hansen.

International law

The activities of the fossil fuels companies in which the University of Glasgow invests also frustrate international law. First, the *Universal Declaration of Human Rights* states that: "Everyone

[311] In the *Cornell Law Review*, Richard James Lazarus notes that: "The traditional objection to lawmaking precommitment strategies — that the present should not be allowed to bind future lawmakers — also has little force in the climate change context where the purpose of such strategies is not to protect the present at the expense of the future, but the precise opposite: to protect the future at the expense of the present." Lazarus, "Super Wicked Problems and Climate Change: Restraining the Present to Liberate the Future", p. 101.

[312] McCarthy, *Jury Decides That Threat of Global Warming Justifies Breaking The Law*.

has the right to life, liberty and security of person".[313] The right to life is a precondition to all other fundamental human rights. The activities of companies in the fossil fuels industry threaten the rights to life and security of the person through mechanisms including the increased frequency and severity of extreme weather, increased occurrence of infectious disease, and loss of agricultural productivity. In addition, the 1989 *Hague Declaration on the Environment* makes the link between the right to life and the harmful effects of climate change explicit: "The right to live is the right from which all other rights stem. Guaranteeing this right is the paramount duty of those in charge of all States throughout the world. Today, the very conditions of life on our planet are threatened by the severe attacks to which the earth's atmosphere is subjected".[314]

The determination of fossil fuel companies to dig up and burn their entire reserves of coal, oil, and gas directly frustrates these international laws. If fossil fuel companies are able to continue to operate under business-as-usual conditions and execute their business plans, the world will experience far more than 2˚C of climate change, with severe impacts on people everywhere.
Fossil fuel companies have repeatedly also frustrated the enforcement of the International Labour Organization's *Indigenous and Tribal Peoples Convention, 1989*.[315] This convention requires that indigenous populations be "consulted on issues that affect them" and that they be able to "engage in free, prior and informed participation in policy and development processes that affect them". In many parts of the world, oil, gas, and coal extraction have taken place without such consultation, or even in the face of active and energetic opposition from indigenous groups. The activities of Shell in the Niger Delta — described more comprehensively in *Section 3.5 Case Study: Royal Dutch Shell* — are an especially notable and egregious example.

The activities of fossil fuel companies are also at odds with the fundamental objective of the *UNFCCC*, which was ratified by the UK and which entered into force on March 21st 1994. The *UNFCCC* affirms the intention of signatories to achieve "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system".[316]

[313] United Nations General Assembly, *The Universal Declaration of Human Rights*.
[314] Representatives from Australia, Brazil, Canada, Cote d'Ivoire, Egypt, France, Federal Republic of Germany, Hungary, India, Indonesia, Italy, Japan, Jordan, Kenya, Malta, Norway, New Zealand, the Netherlands, Senegal, Spain, Sweden, Tunisia, Venezuela, and Zimbabwe, "Hague Declaration on the Environment".
[315] International Labour Organization, *Convention No. 169*.
[316] Parties to the United Nations Framework Convention on Climate Change, *United Nations Framework Convention on Climate Change*, p. 4.

Countries including the UK have since adopted a threshold of 2˚C of global temperature increase above pre-industrial levels as constituting 'dangerous' climate change. The UK's behaviour to date — and the behaviour of fossil fuel companies — has not been consistent with achieving this objective. Achieving this objective requires that most of the reserves of fossil fuel companies be left unburned underground. It also requires the abandonment of projects intended to extract unconventional reserves of fossil fuels, through activities including oil and gas drilling in the arctic, exploitation of the oil sands, and extraction of previously inaccessible oil and gas reserves through hydraulic fracturing.

Rather than curtailing such activities, the UK has recently been on a mission to extend hydraulic fracking, by giving shale gas producers generous tax breaks.[317] The government has furthermore been accused of bribing "[…] local councils to grant planning permission for controversial fracking projects […]," by making a deal in which "[…] councils will be allowed to keep all of the business rates raised from fracking sites in a deal that is expected to generate millions of pounds for local authorities", while regulations are being kept low.[318] All of this is happening despite effects of fracking on the environment and the UK's ostensible aim to mitigate effects of climate change.

Since ratifying the *Kyoto Protocol* in 2002, the UK has made plans to reduce its greenhouse gas emissions by 80 percent by 2050. In order to achieve this target, the UK government has, for instance, set carbon budgets and wants to reduce energy demands and increase the efficiency of energy use, invest in low-carbon technologies, and cooperate on an international level.[319]
Nevertheless, contrary to the government's objectives, the UK's greenhouse gas emissions increased by 3.5 percent from 2011 to 2012, carbon dioxide emissions increased even by 4.5 percent.[320] This frustrated the objectives of the *UNFCCC* and *Kyoto Protocol* both directly and indirectly, as well as the UK's own targets.

The rest of this section will examine the case study of Royal Dutch Shell as an example of a fossil fuel company which has acted in socially injurious ways and also violated international laws.

3.5 Case Study: Royal Dutch Shell

[317] Harvey, Macalister, *George Osborne unveils 'most generous tax breaks in world' for fracking.*
[318] Bawden, *Government accused of 'bribing local councils' omn controversial fracking projects*.
[319] UK Government, *Policy. Reducing the UK's greenhouse gas emissions by 80% by 2050.*
[320] Department of Energy and Climate Change, *Statistical release. 2012 greenhouse gas emissions, provisional figures and 2011 UK greenhouse gas emissions, final figures by fuel type and end-user.*

The preceding sections of this brief show how climate change is causing of increasing instability and harm to the planet. Consequences of climate change have the potential to cause unprecedented levels of social and environmental damage, unless dramatic policy changes are put into place rapidly. One important dimension of that response is the redirection of large amounts of investment away from new fossil fuel developments. The extraction and burning of fossil fuels are the direct causes of climate change, and of all the adverse consequences that follow from it. Investing in the fossil fuel industry perpetuates these activities and thus constitutes deriving financial benefit from harmful activity. This violates the principles of socially and ethically responsible investment.[321]

Shell's activities contribute directly to the harmful effects of climate change. Shell also represents an ideal case for divestment for three main reasons related to the operations of the company:

1. Shell has repeatedly carried out actions resulting in social injury, including conduct in Nigeria and Alberta, Canada that conflict with domestic and international law.
2. Shell represents a financial risk to investors, with even greater shareholder uncertainty in the medium- and long-term owing to proposed projects that are costly and high-risk.
3. Divestment from Shell will not adversely affect the university's portfolio.

The decision to divest from Shell would also signal the University of Glasgow's progressive spirit to other academic institutions, as well as to prospective students, faculty, and staff members. It would be a concrete case of the university applying its values in its key decision-making.

Shell's continuing history of social injury

Royal Dutch Shell has been found to cause social injury as a result of activities that:

1. Directly conflicted with national and international law, and
2. Infringed on governmental regulations or on international health and safety or environmental standards.

The following list of legal actions taken against Shell demonstrates that the company has repeatedly inflicted social harm as a consequence of a number of its global operations.

[321] Richardson, *Socially Responsible Investment Law: Regulating the Unseen Polluters*.

Legal offences in Nigeria

Shell has a long history of human rights and environmental abuses in the Niger Delta region, where it has operated since 1958. In 2012 alone, 198 oil spills took place at Shell facilities in Nigeria, releasing 26,000 barrels of oil.[322] A U.N. report in 2011 determined that cleaning up mangroves contaminated by Shell would take 30 years and cost at least $1 billion.[323] The same report concluded that some families in the area were consuming water with benzene levels 900 times higher than those considered safe by the World Health Organization.[324]

Shell is the midst of a number of litigation processes at various stages, as documented in Shell's 2011 Annual Report:

> Shell subsidiaries and associates operating in Nigeria are parties to various environmental and contractual disputes. These disputes are at different stages in litigation, including at the appellate stage, where judgments have been rendered against Shell. If taken at face value, the aggregate amount of these judgments could be seen as material.[325]

Since the publication of the report, Shell has been found responsible for oil pollution and ordered to pay compensation by a Dutch court in *Niger Delta Farmers vs. Shell* (detailed below).[326] The parties are in the process of negotiating compensation. The full financial impact of the company's "environmental and contractual disputes" in Nigeria is not yet known and could have a material effect on the company.[327] In 2011, *The Economist* argued that "[l]egal pressures on the company are increasing" and that Shell has "paid out $1.7m in compensation to groups in the delta affected by spills".[328]

The following is a partial list of legal challenges to Shell's activities in Nigeria over the span of approximately fifteen years:

Bodo vs. Shell

In this case, which was brought before the High Court in London on June 18th 2012, Shell

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[322] Sekularac and Deutsch, *Dutch court says Shell responsible for Nigeria spills*.
[323] United Nations Environment Programme, *Environmental Assessment of Ogoniland*.
[324] The Economist, *Oil spoils*.
[325] Royal Dutch Shell, *Building an Energy Future: Annual Report*, P.138.
[326] See also: Sekularac and Deutsch, *Dutch court says Shell responsible for Nigeria spills*.
[327] Royal Dutch Shell, *Building an Energy Future: Annual Report*, p. 139.
[328] The Economist, *Oil spoils*.

was challenged by 11,000 members of the Niger Delta Bodo community, who say the company is responsible for spilling approximately 500,000 barrels of oil in 2008. Shell has admitted liability for two spills in the Bodo region.[329] A verdict was reached in January 2013 and Shell has to pay compensation for one oil spill, while other cases were dismissed.[330]

Kiobel v. Royal Dutch Petroleum Co.

In the verdict of this case, the United States Supreme Court drastically "[…] limited the ability of plaintiffs to file suit against corporations in American courts for actions committed abroad."[331] This case was first brought before the United States Supreme Court and granted petition on October 17th 2011. Nigerian plaintiffs accuse Royal Dutch Shell and its affiliate Shell Transport and Trading Company PLC of providing transportation and payments to government forces who committed crimes against humanity in the Ogoni region, including the arrest, torture and murder of protestors challenging Shell operations.[332] [333] This case involves activities included in the *Wiwa v. Royal Dutch Shell Co.* cases described below.

Niger Delta Farmers vs. Shell Oil Company

A verdict for this case was reached in January 2013. Shell Nigerian subsidiary, Shell Petroleum Development Company of Nigeria Ltd. (SPDC), was sued in a Dutch court by four farmers and the environmental organization Friends of the Earth on October 10th 2012. SPDC was found responsible for oil spills in Niger Delta on one of four counts and ordered to pay compensation to Nigerian farmer Friday Akpan for incidents occurring in 2004, 2005, 2007.[334] Compensation is being negotiated. *The Economist* argued that "[t]he ruling could open a flood-gate to legal complaints against oil companies".[335]

Wiwa v. Royal Dutch Shell Co.

In 1993, Ken Saro-Wiwa took part in a march by 300,000 Ogoni people, demanding a share in oil revenues and increased political autonomy. Following a trial by a military tribunal, Saro-Wiwa and eight other Ogoni leaders were hanged in 1995. According to the United Nations Environment Programme: "Continued social upheaval in the area further alienated the Ogoni community from SPDC [Shell Petroleum Development Company (Nigeria) Ltd], and MOSOP

[329] Sekularac and Deutsch, *Dutch court says Shell responsible for Nigeria spills*.
[330] Leigh Day, *Cautious welcome to Shell ruling from British lawyer for Bodo community*.
[331] The Economist. *The Shell game ends.*
[332] Centre for Constitutional Rights, *Kiobel v. Royal Dutch Petroleum Co.*
[333] Radio France Internationale, *Shell could face trial in US for alleged complicity in torture in Nigeria*.
[334] Chazan, *Shell ordered to pay Niger Delta farmer*.
[335] The Economist, *A mixed verdict*.

[Movement for the Survival of the Ogoni People] has since been campaigning for the total expulsion of Shell from Ogoniland".[336] Saro-Wiwa was identified as a "prisoner of conscience" by PEN Canada and Amnesty International, and international appeals and global outrage took place in response to the tribunal's decision.

Under the *Alien Tort Statute*, the *Torture Victim Protection Act* of 1992, and *Racketeer Influenced and Corrupt Organizations Act* (RICO), the Wiwa family has brought three lawsuits against Royal Dutch Shell, its Nigerian subsidiary, and the CEO of that subsidiary in the United States District Court for the Southern District of New York. These cases involved the hanging of Saro-Wiwa and eight others, the detention and torture of Owens Wiwa and Michael Tema Vizor, and the shooting of Karololo Kogbara while she peacefully protested the bulldozing of her crops to permit the construction of a Shell pipeline. The plaintiffs alleged that the executions were carried out with the "knowledge, consent and/or support" of Shell.[337] They also alleged that Shell was paying soldiers involved in human rights abuses in the region.[338] Shell settled legal action out of court with a payout of $15.5 million dollars.[339] The settlement is one of the largest payouts by a multinational corporation charged with human rights violations to date and speaks to the company's complicity in these activities.

US Dept. of Justice vs. Panalpina, Shell, et al.

In 2010, Shell was implicated in a case brought against Panalpina, a Swiss-based company that provides international air and ocean freight, by the U.S. Department of Justice. Panalpina was implicated in foreign bribery charges by U.S. regulatory bodies and settled on a total of $85 million over these allegations. Royal Dutch Shell and five other oil companies were also implicated and charged along with Panalpina, paying a total of $246 million in penalties altogether. As stated by Robert Khuzami, the Director of Enforcement for the U.S. Securities and Exchange Commission (SEC): "These companies resorted to lucrative arrangements behind the scenes to obtain phoney paperwork and special favours, and they landed themselves squarely in investigators' crosshairs".[340] The case is significant for setting a potential precedent of vigilance for global companies that employ external contractors in parts of the world "where resources are plentiful but the rule of law is shaky".[341]

[336] United Nations Environment Programme, *Environmental Assessment of Ogoniland*, p.27.
[337] Kearney, *New York trial delayed for Nigerians suing Shell*.
[338] Mouawad, *Shell to Pay $15.5 Million to Settle Nigerian Case*.
[339] Ibid.
[340] Kochan and Goodyear, *Corruption: The New Corporate Challenge*, p. 119.
[341] Scannell and Catan, *Settlements Near In Bribery Case*.

With respect to Shell's role, the company was implicated in corrupt activities that took place in Nigeria and included the expedition of services such as clearing drilling rigs and other equipment through customs (more specifically, using a customs broker to pay officials to acquire special treatment for a project conducted in Nigeria).[342]

Shell consented to pay a disgorgement of $18.15 million and a criminal fine of $30 million.[343] Shell was subjected to a Deferred Prosecution Agreement (DPA) with the U.S. Department of Justice (DOJ) for violations of the bribery and bookkeeping provisions of the Foreign Corrupt Practices Act (FCPA).[344] Shell also consented to a Cease and Desist Order from the U.S. Securities and Exchange Commission (SEC) on account of record keeping violations and internal control provisions of the FCPA. As a result, the DPA outlined an ethics program designed to prevent and identify any breach of the FCPA as well as any other applicable anti-corruption laws corresponding to all aspects of Shell's operations. The program also calls for Shell to immediately report any evidence of questionable activity to the DOJ. As stated in Shell's 2011 annual report, such activity could have a significant impact on the company: "Any violations of the DPA, or of the SEC's Cease and Desist Order, could have a material adverse effect on the Company".[345]

Gas flaring

In November 2005, a Federal High Court of Nigeria found that "continuing to flare gas in the course of their oil exploration and production activities in the applicants' community is a gross violation of their fundamental right to life (including healthy environment) and dignity of human person as enshrined in the Constitution".[346] The court ordered that Shell "take immediate steps to stop the further flaring of gas in the applicant's community".

Since 2005, Shell has refused to comply with the court order to end gas flaring in the Iwherekan community in Nigeria. Shell is also avoiding payment of $1.5 billion in compensation to the Delta's Ijaw ethnic group for decades of pollution.[347]

Oil spills

Going forward, Shell faces thousands of claims related to oil spills in Nigeria, and charges in the most recent case ("Niger Delta Farmers vs. Shell Oil Company") opens doors for further legal

[342] Voreacos and Calkins, *Shell Bribes Among 'Culture of Corruption,' Panalpina Admits*.
[343] Sullivan and Cromwell, LLP. *Foreign Corrupt Practices Act – Recent Developments*.
[344] Royal Dutch Shell, *Building an Energy Future: Annual Report*, p.17.
[345] Ibid.
[346] Federal High Court of Nigeria, *Gbemre v Shell Petroleum Development Company Nigeria Limited and Others*.
[347] Ukala, "Gas Flaring in Nigeria's Niger Delta: Failed Promises and Reviving Community Voices".

actions.[348]

Possible corrupt practices

In 2011, along with the oil company ENI, Shell purchased a block of offshore oil rights in Nigeria from a corporation called Malabu. Malabu was established days before it acquired the offshore block, and had no employees or other assets. The corporation was controlled by Dan Etete, a former Nigerian oil minister who was convicted of money laundering in France in 2007 and 2009.[349] Court documents show that Shell representatives met directly with Etete.[350] *The Economist* claims that the deal created "reputational and legal risks" for Shell, and that the company "might conceivably face action under [its] home countr[y]'s anti-corruption laws".[351] Global Witness — an American non-governmental organization (NGO) that focuses on natural resource exploitation — has called the deal "a lesson in corruption".[352] [353]

Infringements on governmental regulations and international health and environmental standards with respect to operations in Nigeria

The release of the *Assessment of the Environment of Ogoniland* by the UNEP on August 4th 2011 confirmed the devastating extent of pollution in the minority Ogoni region. The estimated time required for clean-up is between 25 to 30 years. The U.N. condemned Shell for failing to comply to its own operating standards and for under-reporting pollution.[354] The same U.N. report also confirms that all water bodies in Ogoniland have become unsafe for drinking because they have been contaminated with hydrocarbons and carcinogens from Shell's activities.

Shell has repeatedly ignored Nigerian federal law (and its own internal policies) calling for regular inspection and maintenance and upgrading of pipelines and production facilities, as well as and prompt and effective response to oil spills.[355] [356]

Legal offences in Alberta

Shell is one of the biggest players developing the Athabasca oil sands, with 249,000 barrels

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348 The Economist, *A mixed verdict*.
349 The Economist, *Safe sex in Nigeria*.
350 Global Witness, *Shell knew that US$1.1 billion payment was destined for convicted money launderer*.
351 The Economist, *Safe sex in Nigeria*.
352 See: Global Witness, *Shell's obscure payments kill its case for weak US and EU transparency laws*.
353 Global Witness, *Shell and ENI must come clean over oil deals in Nigeria*.
354 United Nations Environment Programme, *Environmental Assessment of Ogoniland*.
355 Steiner, *International Standards to Prevent and Control Pipeline Oil Spills, Compared with Shell Practices in Nigeria*.
356 Steiner, *Double standard: Shell practices in Nigeria compared with international standards to prevent and control pipeline oil spills and the Deepwater Horizon oil spill*.

per day of production from its Scotford upgrader.[357] Shell Canada operates the Alberta Oil Sands Project (AOSP), which consists of the Albian Sands Mine, Muskeg River Mine, Jackpine Mine, and the Scotford Upgrader. In July 2013, a major expansion of the Jackpine Mine was authorized, despite the expectation that this will "involve the permanent loss of thousands of hectares of wetlands, which would harm migratory birds, caribou and other wildlife and wipe out traditional plants used for generations" and that "Shell's plans for mitigation are unproven and... some impacts would probably approach levels that the environment can't support".[358] [359] [360] The Athabasca Chipewan First Nation expressed its disappointment about this decision.[361]

The AOSP is close to a number of First Nations communities who claim that the project adversely affects their health, livelihood, and lands.[362] Under Canadian constitutional law, there is a duty to consult and accommodate aboriginal people on development projects that affect them. First Nations have launched a series of legal proceedings related to tar sands development that could impact the viability of Shell's current and future operation plans.

Ongoing — ACFN vs. Shell Canada In continuing legal battles throughout 2011—2012, the Athabasca Chipewyan First Nations (ACFN) sued Shell Canada for breach of terms of agreements made in 2003 and 2006 regarding the company's existing tar sands mines.[363] The ACFN alleges that Shell has not honoured these agreements and that these breaches have allowed Shell's operations to continue damaging the surrounding environment and the infringing upon the rights of ACFN peoples. Affected First Nations communities continue to seek legal options to delay or halt Shell's operations in the AOSP.

2009 — Ecojustice vs. Shell Canada Ecojustice, an environmental NGO, took Shell to the Alberta Court of Appeal after Shell breached signed commitments with the government of Alberta to reduce carbon emissions for the Jackpine and Muskeg River mines. Alberta courts instructed regulators to ignore the breach. However, the ruling has prompted both residents and elected officials in Alberta to demand an overhaul of regulatory approval processes in the province.[364]

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[357] AlbertaEnergy, *Facts and Statistics*.
[358] Canadian Environmental Assessment Agency, *Joint Review Panel Issues Report On Jackpine Mine Expansion Project*.
[359] The Canadian Press, *Alberta greenlights Shell's Jackpine oilsands expansion*.
[360] The Canadian Press, *Shell Canada's oilsands expansion approved amid environmental concerns*.
[361] Athabasca Chipewyan First Nation, *ACFN disappointed by JRP's initial approval of Shell tar sands mine expansion; expects mitigation and accommodation to be in place prior to further approvals for the expansion*.
[362] Amuna et al., *Risking Ruin: Shell's Dangerous Developments in the Tar Sands, Arctic, and Nigeria*.
[363] CTV Calgary, *First Nation sues Shell*.
[364] Amuna et al., *Risking Ruin: Shell's Dangerous Developments in the Tar Sands, Arctic, and Nigeria*.

Cases related to groundwater contamination As described in their 2011 Annual Report, Royal Dutch Shell (including subsidiaries), has been sued repeatedly by public and semi-private water purveyors, as well as governmental bodies, who insist that Shell take responsibility for groundwater contamination in various instances.[365] As outlined in the Annual Report, at the end of 2011, fewer than 10 of these cases remained open, with the remaining cases in various stages of litigation. The number of allegations made by numerous public and private entities, including governmental agencies, speaks to Shell's consistent negligence in ensuring environmental safety. While groundwater cases remain ongoing, a study published by Alberta Health in 2008 confirmed a 30 percent rise in the number of cancers between 1995 and 2006 in the community of Fort Chipewyan,[366] providing scientific evidence supporting the allegations of First Nations residents that AOSP activities were polluting the surrounding environment.[367] An internal government memo, obtained by journalist Mike De Souza by virtue of access to information legislation, confirms groundwater toxins related to bitumen mining and upgrading are seeping from tailings ponds and contaminating groundwater. These toxins are not naturally occurring, contrary to statements made by government and industry.[368] [369]

Alongside the promise of future legal conflicts as a result of the company's activities in Nigeria, more legal challenges are almost certain to arise as First Nations communities continue to oppose Shell's operations. The International Finance Corporation's (IFC) implementation of a new Sustainability Framework, which requires clients of Equator Principle banks to obtain the free, prior and informed consent of indigenous communities impacted by mining projects, poses a significant obstacle to the company going forward where they conflict with the interests of various First Nations communities.[370] In addition, the International Covenant on Civil and Political Rights states that: "In no case may a people be deprived of its own means of subsistence."[371] Shell violates this obligation by making the waters of the Niger Delta unsafe to drink, and threatens to do so further by contaminating the food and water of aboriginal communities in Alberta and the arctic.

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[365] One barrel of surfaced-mined oil from tar sands extraction requires 2–4 barrels of freshwater and creates about 1.5 barrels of toxic waste. This waste is held in 'tailings ponds', which covered 176km2 in 2010 and contained 830 billion litres of toxic waste. Shell's tailings ponds cover 23km2 and contain millions of litres of toxic waste. Each day, 11 million litres of waste leaks into the Athabasca River from tar sands operations. These toxins are known carcinogens and leaks have had devastating impacts on human and ecological health.

[366] Amuna et al., *Risking Ruin: Shell's Dangerous Developments in the Tar Sands, Arctic, and Nigeria*.

[367] This study, however, lacks appropriate data and is considered a conservative estimate by many residents.

[368] Natural Resources Canada, *Memorandum to the Minister: Pending Release by Natural Resources Canada of Reports on Natural vs. Human-Caused Contamination in the Oil Sands Region of the Athabasca River, Alberta*.

[369] See also: De Souza, *Oilsands tailings leaking into groundwater, Joe Oliver told in memo*.

[370] Sosa, *License to Operate: Indigenous Relations and Free Prior and Informed Consent in the Mining Industry*.

[371] Part I, Article I (2) United Nations General Assembly, *International Covenant on Civil and Political Rights, G.A. res. 2200A (XXI), 21 U.N. GAOR Supp. (No. 16) at 52, U.N. Doc. A/6316 (1966), 999 U.N.T.S. 171*.

Continued threats to human rights, environmental well-being and international law Court rulings in cases brought against Shell over the past fifteen years have resulted in determinations of guilt, out of court settlements, and case dismissals. In Shell's case, the sheer volume of allegations against the company is demonstrative of Shell's history of causing social injury and often refusing to desist even when ordered by courts.

Shell's record of being the target of lawsuits raises the question of whether this investment represents the values of the University of Glasgow, in addition to being a material risk to the company's profitability going forward.

Moreover, a review of Shell's most recent activities and the projects it has slated for the immediate future suggests that Shell will continue to engage in activities that constitute human rights abuses and environmental degradation.

For instance:

1. In the summer of 2011, Shell supported Syrian President Bashar al-Assad's regime by contributing over $55 million during government crackdowns.[372] Moreover, Shell continued drilling and exporting crude oil from Syria throughout the first year of the popular revolt and did not halt operations until Western-imposed oil sanctions and global outrage forced them to withdraw from the country on the December 2nd 2011.
2. Both Shell's current activities and its proposed projects in the arctic will threaten local First Nations communities such as the Inupiat who live around the Beaufort and Chukchi Sea and who practice a subsistence culture, both by tradition and by necessity.[373]

In May 2013, members of the Native Village of Port Hope, Alaska and the ACFN participated in Shell's Annual General Meeting and confronted Shell's chairman about the risks of drilling in the arctic.[374] In addition to the direct threat posed to people living in the region, arctic drilling risks adding to the already dangerously large reserves of fossil fuels being exploited globally, contributing further to the universal threat of climate change.

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[372] Minio-Paluello, *Shell supports Syrian regime with $55 million during crackdown; one out of six Syrian tanks runs on Shell oil.*
[373] Amuna et al., *Risking Ruin: Shell's Dangerous Developments in the Tar Sands, Arctic, and Nigeria*, p. 13.
[374] Gemmill, *Shell and the Arctic Oil Rush*.

Shell represents financial risk

Royal Dutch Shell and its subsidiaries are a risky investment for two main reasons:

1. Previous violations of human rights and environmental regulations may ultimately have a material effect on the company; the same activities can also manifest in decreased shareholder confidence.
2. High-risk ventures going into the medium and long term introduce uncertainty on a number of levels.

Poor reputation for social responsibility lowers shareholder confidence

Shell's reputation for complicity in human rights and environmental degradation has resulted in reduced shareholder confidence and has prompted socially conscious investors to avoid holding Shell stock. For instance, the Dow Jones Sustainability Index, which integrates assessment of economic, environmental and social criteria with emphasis on long-term shareholder value, excluded Shell from the index in both 2010 and 2011 following concerns about the company's activities in Nigeria (which include both human rights and environmental abuses).[375] Shell's European Universe was included in the 2012 Index, but all others remain excluded (including the North American, Asia Pacific, Aussie, Emerging Markets, Korean Universes).

In February of 2012, 28 Right Livelihood Award Laureates, including conservation scientists and professionals, petitioned the Norway Government Pension Fund to divest all its holdings in Royal Dutch Shell. The petition was made after this group, in collaboration with Nigerian scientists and communities, found the Delta to be "one of the most severely oil-impacted ecosystems in the world".[376] This collaboration between scientists and Nigerian residents led to the 2011 UNEP assessment discussed above. As stated in their petition, the argument for divestment is based on the company's "willful negligence" which resulted in the extensive environmental harm found in the Niger Delta region.[377]

In an era where mass media coverage surrounds environmental disasters and human rights abuses, the reputational risks of conduct like Shell's are magnified.

Fossil fuel extraction in the arctic is a particularly high-risk and unpredictable endeavour

[375] Reuters, *Shell to scrap bonus link to sustainability index*.
[376] Nigeria Conservation Foundation and IUCN/CEESP, *Niger Delta Natural Resource Damage Assessment and Restoration Project – Phase I ScopingReport*.
[377] Right Livelihood Award Foundation, *Petition for Norway Pension Fund. The Right Livelihood Award*.

The arctic is experiencing some of the most profound and rapid effects of climate change. World renowned physicist and oceans expert Peter Wadhams calls the situation in the arctic a "global disaster", observing that ice is disappearing at a faster rate than previously predicted.[378] The IPCC has observed that: "Average Arctic temperatures have increased at almost twice the global average rate in the past 100 years".[379] The rapid warming of the arctic has global consequences, as vanishing sea ice is replaced with darker water and more energy and heat are absorbed by the Earth from the sun.

Despite the growing body of accepted scientific facts that point towards the significant and unpredictable consequences of a melting arctic, Shell has spent over $4.5 billion on operations and lease purchases in the far north, taking advantage of the climate impacts in the arctic to advance further exploration and drilling.[380] Because Shell's production has been decreasing for the past 10 years — with the exception of a 5 percent increase in 2010 — booking new reserves is of primary importance for the company. This is driving Shell to invest in more pollution-intensive forms of oil, such as those in Canada's oil sands, as well as oil reserves that are riskier to extract, such as those in the arctic. Shell's Alaskan project alone accounted for about one-seventh of Shell's total exploration spending in 2011. Although arctic extraction projects represent a new branch of growth for the company, these projects are also risky for shareholders for four reasons:

1. High costs

Unconventional methods of extracting oil, especially in harsh and isolated regions such as the arctic, are extremely costly because of technological requirements, human resources, costs of spill cleanups, and other related expenses. For example, Shell's Sakhalin-2 project in Russia saw an unexpected cost overrun from $6 to $22 billion in 2006.[381]

Moreover, recent incidents have cast doubt on Shell's capacity to undertake arctic operations safely. Sixteen distinct and serious safety and environmental violations were discovered on the Noble Explorer — a Shell drilling rig anchored in the arctic waters off Alaska. The UK Coast Guard inspected the rig and reported findings of "systematic failure and lack of main engine preventative maintenance".[382] [383] These findings have been turned over to the U.S. Department of Justice and

[378] Vidal, *Arctic expert predicts final collapse of sea ice within four years*.
[379] Intergovernmental Panel on Climate Change, *Fourth Assessment Report: Climate Change 2007*, Climate Change 2007: Synthesis Report – Observed changes in climate and their effects.
[380] Broder, *With 2 Ships Damaged, Shell Suspends Arctic Drilling*.
[381] For more on these four central risk factors see: Greenpeace, Platform, and FairPensions, *Out in the Cold: Investor Risk in Shell's Arctic Exploration*.
[382] Cockerham, *Coast Guard: Shell Arctic rig findings turned over to Justice Dept.*
[383] See also: Beinecke, *Six Reasons Arctic Offshore Drilling Cannot Be Done Safely*.

U.S. federal prosecutors have been asked to take legal action over these violations as of late February, 2013.

2. Arctic projects are dependent on a favourable political climate

An interaction of soaring costs, uncertainty related to project completion, and popular resistance against drilling in sensitive regions such as the arctic may lead to difficulties securing subsidies or tax breaks from governments. Shell has "spent several years on an intensive lobbying campaign to persuade federal officials that it could drill safely" in the arctic.[384] The credibility of this claim is diminished by Shell's inability to operate drilling rigs safely in the region. Furthermore, the Deepwater Horizon disaster in the Gulf of Mexico has raised awareness among policy-makers and the general public about the risks involved in oil extraction within extreme environments, as well as the inability of major oil firms to rapidly contain serious spills when they occur.

3. Lack of oil spill plan

There is no proven method to clean up an oil spill in the remote and extreme arctic landscape, nor are there many resources available for such an event. A 2011 report from top scientists at the U.S. Geological Survey confirm that not enough is known about the Arctic's unique marine environment to ensure an adequate or sufficient clean up plan in the case of an oil spill. As asserted in this survey, this lack of knowledge presents a "major constraint to a defensible scientific framework for critical Arctic decision making".[385] Shell's inability to operate drilling equipment safely in the arctic is highlighted by the damage suffered by the company's two drilling ships — Kulluk and Noble Discoverer — which were attempting to operate in the region.[386] As a result of these incidents, Shell has cancelled its arctic drilling plans outright through 2013, though it has stated its intention to resume arctic drilling in future seasons.

4. Funding challenges

The social and environmental responsibility guidelines of international financial institutions (IFIs) and signatories to the Equator Principles — the voluntary set of standards for assessing and managing social and environmental risk — have delayed or halted funding for frontier extraction projects in the past. For example, the European Bank did not solicit funds in 2003–2006 for the Reconstruction and Development (EBRD) of Shell's Sakhalin-2 because of serious breaches of their

[384] Broder, *With 2 Ships Damaged, Shell Suspends Arctic Drilling*.
[385] Holland-Bartels and Pierce, *An Evaluation of the Science Needs to Inform Decisions on Outer Continental Shelf energy Development in the Chukchi and Beaufort Seas, Alaska*.
[386] Broder, *With 2 Ships Damaged, Shell Suspends Arctic Drilling*.

environmental and sustainability guidelines. Growing frustration and resistance from First Nations communities and the implementation of new IFC guidelines promise more delays on account of legal challenges raised by affected communities.[387]

Supporting industry-based evidence of risks to Shell's current and proposed projects

1. On March 8th, 2013, Norwegian state-owned oil company, Statoil, announced that it is slowing plans to drill for oil in U.S. arctic waters after Shell's most recent string of incidents in the arctic.
2. German bank WestLB announced it would not invest in any company drilling in the arctic because the "risks and costs are simply too high".[388]
3. Total, the French oil company, has disavowed drilling in the arctic; CEO Christophe de Margerie claims that "Oil on Greenland would be a disaster ... A leak would do too much damage to the image of the company".[389]
4. Growing resistance around production of oil sands puts operations there at risk, as Shell has already faced shareholder resolutions demanding greater clarity over the risk of oil sands investments.
5. The Carbon Bubble: Latest climate science tells us that approximately 80 percent of reserves owned by fossil fuel companies cannot be burned. As policy-makers and the financial industry absorb this information, the business case for drilling in extreme environments and exploiting unconventional reserves may be under-mined.[390] [391] [392]

3.6 Why fossil fuels are like tobacco

The University of Glasgow based its decision to divest from the tobacco industry on the grounds that "[…] such an investment runs entirely counter to the University's direct interest in research."[393] There are several important ways in which the tobacco precedent is relevant to fossil fuel divestment.

First, the scientific case demonstrating the harm caused by tobacco strengthened progressively over the span of decades. Companies were initially willing to challenge these claims, but the weight of evidence eventually made their case untenable. Similarly, the evidence demonstrating the

[387] Mathiason, *EBRD freezes Shell Sakhalin loan*.
[388] Naidoo, *Drilling for oil in the Arctic: the risks are too great for companies to take on*.
[389] NBC News Wire, *Environmental risk of drilling in Arctic too high, CEO of oil giant Total says*.
[390] Carbon Tracker Initiative, *Carbon Tracker Initiative*.
[391] United Nations Environment Programme, *Climate and Trade Policies in a Post-2012 World.*
[392] Spedding, Mehta, and Robins, *Oil and carbon revisited: Value at risk from 'unburnable' reserves*.
[393] University of Glasgow, *Socially Responsible Investment Policy.*

seriousness of anthropogenic climate change has now progressed beyond the point where it can be considered a subject of on-going academic inquiry and debate.

Second, in both the cases of tobacco and fossil fuels, the problem is the primary product being produced by the industry. Just as it would be ineffective to use shareholder voice to try to convince a tobacco company to stop producing and selling tobacco, it is implausible that the university could use shareholder activism to convince fossil fuel companies to desist from activities that create and facilitate major GHG pollution.

Third, both tobacco and fossil fuel consumption are distinct from other products that can be argued to cause social harm in that each item has "no safe use".

Furthermore, divestment from fossil fuels is a legitimate action in acknowledgment of the university's own position on promoting environmental responsibility as stipulated in its Environment Policy as well in its commitment to initiatives like the Carbon Management Plan and the Universities and Colleges Climate Change Commitment for Scotland.[394]

The University of Glasgow should act in response to the strengthening consensus amongst governments, scientific organizations, and financial institutions. These organizations are increasingly recognizing the risks of climate change to human health and ecosystems as well as global economic stability and the viability of investments around the world.

Additionally, if the University of Glasgow initiates divestment from the fossil fuel industry, other institutions are likely to see it as a role model and follow the actions of prominent and influential institutions such as the University of Glasgow.

[394] University of Glasgow, *Environmental Policy* and *Carbon & Energy Management Policy*.

4 | Investment in the Fossil Fuel Industry Runs Counter to the University's Direct Interests in Research

The University of Glasgow's Socially Responsible Investment Policy states that investment in the tobacco industry runs entirely counter to the university's direct interests in research. For this reason, the university has instructed its fund managers not to invest in the tobacco industry. The same contradiction exists for investments into the fossil fuel industry. Research into climate change is being conducted at the University of Glasgow in a number of different departments. The fossil fuel industry has a direct financial interest in preventing cuts to fossil fuel emissions. Investing in the industry, whilst also conducting research into climate change, runs counter to the university's direct research interests.

This section will list some of the specific research projects relating to climate change which are currently being conducted at the University of Glasgow, as well as some that have been conducted in recent years, in order to exemplify the many areas of research being conducted at the university which are engaging with climate change.[395]

4.1 Current Research Projects

- School of Social and Political Science

Dr Greg Philo (*Principal Investigator*) and Dr Catherine Happer (*Co-Investigator*)
Project Title: 'Future Cities Demonstrator: Public attitudes, beliefs and engagement with energy behaviours.'
Funded by Glasgow City Council, Future Cities, Technology Strategy Board

- School of Education

Dr Rebecca Mancy*, Senior Lecturer (Interdisciplinary Science Education Technologies and Learning)*
Research focus: Science communication for behavioural change.

- The Boyd Orr Centre for Population and Ecosystem Health

Alexia Koletsou, *PhD Candidate*

[395] It should be noted that this list is by no means comprehensive, and should be used only as an indicator of the kinds of climate-related research being conducted at the university.

Thesis Title: Science communication leading to behavioural change in social dilemma situations: the case of behaviours to mitigate climate change.

- School of Geographical and Earth Science

Jill McColl, *PhD Candidate*

Thesis Title: Climate variability of the last 1000 years in the NW Pacific: high resolution, multi-biomarker records from lake and ocean sediments

- Institute of Biodiversity, Animal Health, and Comparative Medicine

Charlotte Hopkins*, PhD Candidate*

Thesis Title: Marine Protected Areas (MPAs), climate change resilience and the socio-economic impacts of MPA networks.

4.2 Recently Conducted Research

Asteriti, A. (2014) 'Climate change policies and foreign investment: some salient legal issues', in: *Bridging the Gap between International Investment Law and the Environment*. Eleven Legal Publishing. (Accepted for Publication)

Auer, S.K., and Martin, T.E. (2013) 'Climate change has indirect effects on resource use and overlap among coexisting bird species with negative consequences for their reproductive success,' *Global Change Biology,* 19 (2). pp. 411-419.

Brown, D.J., and Lee, M.R. (2007) 'From microscopic minerals to global climate change?' *Geology Today,* 23 (5). pp. 172-177.

Duthie, L. J. (2012) *The impact of climate change on blond sandstone decay in Glasgow.* PhD thesis, University of Glasgow.

Happer, K. and Philo, G. (2012) 'Climate Change and energy security: Assessing the impact of information and it's delivery on attitudes and behaviours', *UK Energy Research Centre.*

Happer, K. and Philo, G. (2013) *Communicating Climate Change and Energy Security: New Methods in Understanding Audiences,* Routledge.

Knight, C. (2011) 'Climate change and the duties of the disadvantaged: Reply to Caney', *Critical Review of International Social and Political Philosophy,* 14 (4). pp. 531- 542.

Larrinaga, C., Bebbington, J., Sales de Aguiar, T.R., and Lovell, H. (2012) 'Accounting for carbon allowances,' in Jackson, F. (ed.) *Corporate Climate Risk Disclosure,* Environmental Finance Publications.

Lovell, H., Bebbington, J., Larrinaga, C., and Sales de Aguiar, T.R. (2013) 'Putting carbon markets into practice: a case study of financial accounting in Europe,' *Environment and Planning C: Government and Policy,* 31 (4). pp. 741-757.

Sales de Aguiar, T.R., and Fearfull, A. (2010) 'Global climate change and corporate disclosure: pedagogical tools for critical accounting?*' Social and Environmental Accountability Journal,* 30 (2). pp. 64-79.

Undergraduate Research

Greenland360: 2014 Expedition
Expedition to study the ice melt and retreat of the Russell glacier in Greenland.
Conducted by: Craig Mushet, Alex Clegg, Cameron Mackay, Emily MacDuff and James Wylie.

Sustainable Development Network

The Sustainable Development Network links the University's four Colleges in a way that will offer cross-cutting inter-disciplinary research to tackle some of the major global sustainability challenges and to present a unified front to stakeholders and the external world. The idea is also to link with the Research Councils UK inter-disciplinary agenda: Living with Environmental Change.[396]

Taught Courses

[396] University of Glasgow, *Glasgow Sustainable Development Network*

The university also offers a number of undergraduate and postgraduate taught courses specialising in climate change and sustainability. Some examples include:

- Geography 1 Living in a Changing World GEOG1001
- Geography 2 GEOG2001
- Environmental Hazards GEOG4090
- Impacts of Climate Change GEOG5054
- Environmental Science DUMF1007
- Global Environmental Issues DUMF1008
- Energy: Options for Sustainability DUMF2019
- Human Impact on the Environment DUMF3045
- Environmental Policy and Management DUMF4040
- Environmental Stewardship Project DUMF4008P
- Climate, Carbon and Change DUMF5003
- Environmental Communication DUMF5079
- Sustainable Energy and the Built Environment DUMF5082
- Tourism Sustainability and Climate Change DUMF5019
- MSc on Carbon Management

5 | Divestment is compatible with the university's fiduciary duties

5.1 Fossil fuel divestment is financially responsible

Any fiduciary has two main factors to consider in investments: risk and return. Fossil fuel divestment offers considerable potential to mitigate important risks, while creating only negligible new ones. In addition, the historical returns of a portfolio that excludes fossil fuel stocks are comparable to those with no such exclusion, and there are good reasons to believe that the future returns of non-fossil-fuel investments will be competitive. This section will consider both the financial case for divestment and questions about the practicality of divesting from a financial perspective, including the need to uphold the fiduciary duties borne by the University of Glasgow.

In advice provided to the United Nations Environment Programme Finance Initiative, Freshfields Bruchhaus Deringer considered the relationship between fiduciary duty and environmental, social and governance (ESG) issues within common law jurisdictions. They explain that: "[t]he modern prudent investor rule, which incorporates both a duty of care and a duty of loyalty, emphasises modern portfolio theory and provides that: ... there is no duty to 'maximise' the return of individual investments, but instead a duty to implement an overall investment strategy that is rational and appropriate to the fund."[397] They go on to explain that: "[t]here is accordingly no reason why investment strategies should not include investments with positive ESG characteristics. The important limiting requirement is that imposed by the duty of loyalty: all investment decisions must be motivated by the interests of the fund's beneficiaries and / or the purposes of the fund." [398] In the same report, they claim: "Climate change is an obvious example of an environmental consideration that is recognised as affecting value." [399] As this brief explains in detail, the beneficiaries and purposes of the University of Glasgow's investments will be well-served by fossil fuel divestment. Such divestment is unlikely to be financially harmful, will help the university reduce exposure to important risks, and will be in keeping with the values and reputation of the institution.

The International Energy Agency argues that: "the deployment of a low-carbon energy system... delivers wide benefits by enhancing energy security, environmental protection and economic growth", that: "a low-carbon energy system increases energy security, particularly for

[397] United Nations Environment Programme, *A legal framework for the integration of environmental, social and governance issues into institutional investment, p. 6.*
[398] United Nations Environment Programme, *A legal framework for the integration of environmental, social and governance issues into institutional*
[399] Ibid., p. 11.

energy importing countries, through reduced energy dependence and greater diversity of energy sources and technologies", and that: "the pathway to [stabilizing global temperatures at less than 2˚C above pre-industrial levels] is not just environmentally necessary but economically sound."[400] They argue that the net benefit of decarbonization amounts to US $61 trillion if not discounted and US $5 trillion if using a 10 percent discount rate. Furthermore, they argue that: "low-carbon technologies often also reduce local air pollution, providing other environmental benefits and improve quality of life."

5.2 There is no evidence of a divestment penalty for investors

Several studies have attempted to quantify the financial consequences of taking environmental factors into account in the investment management process. In aggregate, these studies found no significant impact on investment risk in predictive models, nor a performance penalty in tests using historical data.

Historical

The U.N. Environment Program Finance Initiative's analysis of twenty academic studies on the effect of incorporating ESG factors in the investment management process found no evidence of a resulting performance penalty. The two reviewed studies that focused specifically on environmental factors found a positive relationship between consideration of those factors and performance.[401]

Risk Based Assessment

The Aperio Group found that divesting from the "Filthy Fifteen" "increases absolute portfolio risk by only 0.0006 percent, or about a half of one one-thousandth of a percent." Even divesting from the entire Fossil Fuel sector only results in a 0.0034 percent return penalty.[402] In other words, the portfolio does become riskier, but by such a trivial amount that the impact is statistically insignificant.[403]

Forward Looking

Carbon Tracker and Standard & Poor's together conducted a study on the implications of

[400] International Energy Agency, *The wider benefits of the 2˚C Scenario*.
[401] United Nations Environment Programme Finance Initiative and Mercer, *Demystifying Responsible Investment Performance: A review of key academic and broker research on ESG factors*.
[402] For the purposes of this study, the "Filthy Fifteen" was defined as the group of 15 U.S."companies judged by As You Sow and the Responsible Endowment Coalition to be the most harmful based on the amount of coal mined and coal burned along with other metrics."
[403] Geddes, *Do the Investment Math: Building a Carbon-Free Portfolio*.

carbon constraints for credit ratings of the oil and gas sector. Their scenario assumes reducing demand for CO_2-intensive fuels, in line with the internationally recognized limit of a 2˚C rise in global temperatures, and is "not materially different from the current price deck assumptions". The study concludes with the statement:

> [A]s the price declines persist in our stress scenario of weaker oil demand, meaningful pressure could build on ratings. First to be affected would be the relatively focused, higher cost producers, and then the more diversified integrated players. In both cases, according to our study, the causes would be a decline in operating cash flows, weakening free cash flow and credit measures, along with less certain returns on investment and less robust reserve replacement.[404]

Meta-Analysis

It is frequently assumed that excluding the fossil-fuel sector from a portfolio will inevitably lead to reduced performance, owing to the reduction in potential investment opportunities. However, empirical research has repeatedly shown this assumption is fallacious. Deutsche Bank and Mercer have conducted major meta-studies that discovered the vast majority of academic studies of ESG investment performance found the incorporation of ESG factors into portfolio management to be either neutral or positive.[405] [406]

Case Study

Portfolio 21, based in Portland, Oregon, created one of the first sustainability-themed global equity mutual funds, known as Portfolio 21 Global Equity Fund (PORTX). The institutional share class has outperformed its benchmark by 105 basis points annualized over the past five years and by 93 basis points annualized over the last decade. Portfolio 21 has therefore demonstrated for more than a decade that a global investment strategy that avoids fossil fuels — and many other unsustainable industries — need not come at the cost of financial performance or increased portfolio risk.[407]

Canadian socially-responsible investment funds like the NEI Ethical Canadian Dividend A fund (which tries to balance social concerns with returns) have outperformed the S&P / TSX total

[404] Redmond and Wilkins, *What A Carbon-Constrained Future Could Mean For Oil Companies' Creditworthiness*.
[405] Deutsche Bank Group, *Sustainable Investing: Establishing Long-term Value and Performance*.
[406] Mercer, *Shedding Light on Responsible Investment: Approaches, Returns and Impacts*.
[407] Humphreys, *Institutional Pathways to Fossil-Free Investing*.

return in 2013.[408]

In July 2013, Impax Asset Management published a study examining the last seven years' worth of data on international equity markets. They compared a portfolio consisting of the MSCI World Index with another in which fossil fuel stocks were excluded and determined:

> Excluding the fossil energy stocks from the MSCI World Index over the last seven years (to the end of April 2013) would have had a small positive impact on returns (0.5 percent annually) and only a modest increase in tracking error of 1.6 percent a year. For the five years to the end of April 2013, which excludes the dramatic run up in energy prices ahead of the 2008 financial crash, excluding the fossil energy sector would have improved returns by almost 0.5 percentage points annually, to 2.3 percent a year from 1.8 percent. Again, tracking error is low at 1.6 percent.[409] [410]

These conclusions are echoed in recent analysis from MCSI ESG Research:

> Over the period from January 2008 through March 2013, the market capitalization of the 247 fossil fuel reserve-owning companies described above ranged from approximately 7 percent to 8 percent of the MSCI ACWI IMI. Hence, excluding these stocks left between 93 percent and 94 percent of the MSCI ACWI IMI intact over the time series in terms of market capitalization. This meant that for each 10 percent active return differential in the carbon reserve stocks relative to the MSCI ACWI IMI, the effect of removing these stocks from the index ranged from 0.7 percent to 0.8 percent (70 to 80 basis points) in changes to active returns. Nearly all of this effect was due to industry factors, as opposed to country exposure and other style factors. As shown in the chart below, the performance of the MSCI ACWI IMI excluding the carbon reserve stocks closely tracked the MSCI ACWI IMI over the time series. Slight underperformance of the "ex Carbon list" appeared near the beginning of the time series, and slight outperformance of the "ex Carbon list" emerged toward the end of the time series. The active return differential over the entire time series was 1.2 percent (120 basis points) in favor of the "ex Carbon list" relative to the full MSCI ACWI IMI. The tracking error relative to full index was 1.9 percent (190 bps).[411]

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[408] Nelson, *Socially responsible investment funds hold their own*.
[409] Impax Asset Management, *Beyond Fossil Fuels: The Investment Case for Fossil Fuel Divestment*, p. 5.
[410] See also: Thorpe, *Investment Funds Divested From Fossil Fuels "Will Perform Better"*.
[411] MSCI ESG Research, *Responding to the Call for Fossil-fuel Free Portfolios*, p. 5.

There is reason to believe, therefore, that divestment would involve only a limited risk of foregoing improved ratings and investment returns. Indeed, divestment could actually benefit the portfolio, in that it would remove risk of being invested in companies whose ratings appear most likely to decline in the long term.

5.3 Market capitalization and value at risk

The Carbon Tracker Initiative's 2009 *Unburnable Carbon* report explains that global financial markets are in the midst of a 'carbon bubble' that must be strategically deflated in the move to a clean energy economy. The report states that 80 percent of proven reserves of fossil fuels need to stay underground if we are to have a chance of avoiding more than a 2°C rise in global temperatures over the next 40 years.[412] This unwelcome information has not been internalized by the fossil fuel industry. As a result, the business plans and stock market valuations of fossil fuel companies are based on the unjustified assumption that they can continue to use the global atmosphere as a free dumping ground for greenhouse gas pollution. As the injury caused by climate change has more obvious, governments have become increasingly willing to regulate fossil fuel use. This progression can be expected to continue in the future, eventually compelling fossil fuel companies to leave significant reserves unburned. [413] Burning fossil fuels causes considerable amounts of social injury, and the prospect of strengthened regulations on greenhouse gas pollution threatens the profitability and stockmarket value of fossil fuel companies.

A recent article in the *National Post* describes the 'carbon bubble' and the risks it poses for investors: "energy sector valuations ignore the world's climate change target and could be decimated if the international community puts its money where its mouth is and collectively moves to protect Mother Earth by attacking demand for oil, coal and gas." [414] [415] It goes on to explain: "if the international community gets serious about its stated [2˚C] temperature goal, about two-thirds of existing energy sector reserves, which currently support about US$4 trillion in share value and back more than US$1 trillion in debt, are actually superfluous to the world's needs." The Climate Commission established by the Australian government echoes these findings.[416] Simon McKeon, the executive chairman of the commission, argues that: "[a]nyone who believes they have literally hundreds of millions tonnes of first rate high emitting CO_2 coal can no longer blindly believe there will be a strong market for that in 20, 30 years" and that "the best of resource investors are

[412] Carbon Tracker Initiative, *Unburnable Carbon*, pg. 2
[413] See, for instance: De Souza, *Global climate efforts threaten oilsands growth, memo told Natural Resources Minister Joe Oliver*.
[414] Watson, *Oil giants could feel major pain should world get serious about reducing global temperatures*.
[415] See also: Lubber, *Fossil Fuel Divestment Is A Timely Issue For Investors*.
[416] Government of Australia Climate Commission, *The Critical Decade 2013*.

absolutely on to this."[417]

5.4 Stated policy objectives are incompatible with the current valuation of fossil fuel reserves

Fossil fuels may provide a hedge against other asset classes, but only in scenarios where unconstrained emissions lead to accelerated and possibly catastrophic warming. The international community is in broad agreement that this must not happen.

Regulatory risk is not adequately priced

As one scenario for the *World Energy Outlook* in 2012, the IEA assumes international cooperation to keep CO_2 under 450ppm, which in their model constrains the likelihood of warming greater than 2°C to 55 percent. This is in contrast to their baseline New Policies Scenario, which assumes modest reductions in the rate of emissions increase compared to the third scenario, Current Policies. Evaluating the effect of this scenario on the price of fossil fuels, they estimate:

> Compared with the New Policies Scenario, the global oil price in the 450 Scenario in 2035 is $25 per barrel lower and the coal price almost 40 percent lower. The price for natural gas falls by 23 percent in Europe and 4 percent in North America.[418]

In a report for the Australian National University and the Investor Group on Climate Change, Dr. Michael H. Smith concluded that: "Climate change is forecast to dramatically increase the exposure of oil and gas companies to climate, energy and carbon price risks."[419]

For any scenario where emissions are constrained to keep warming under 2°C, market assumptions regarding the profitability of fossil fuel extraction are necessarily optimistic.[420] [421] Marginal projects will become unprofitable and returns to investors for even the most profitable projects will decline. Indeed, a study conducted by Standard & Poor's even indicates near-term threats to the stability of investing in some fossil fuel companies: "Under our stressed scenario, the ratings on companies with high development and production costs, including those focused on unconventional resources, could see rating pressure build *within one or two years*, especially if the

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[417] Priest, *Climate Commission warns coal will be left in ground*.
[418] International Energy Agency, *World Energy Outlook: 2012*, p. 257.
[419] Smith, *Assessing Climate Change Risks and Opportunities for Investors: Oil and Gas Sector*, p. 14.
[420] See: Kiesel, *Why It Makes More Sense to Dump Your Fossil Fuel Stocks*.
[421] Yonavjak, *Divesting From Fossil Fuels Means A Cleaner, Safer And More Resilient Future*.

companies are relatively undiversified" (emphasis ours).[422] The study continues: "We see a deterioration in credit measures for these smaller oil companies over 2014–2015, to a degree that could potentially lead to negative outlook revisions and downgrades over 2014–2017... this could result in an earlier deterioration in our business risk profile assessments." Furthermore, "the financial risk profiles of the oil majors would weaken modestly over the next five years". It is also worth noting that the study claims: "the core business model [of fossil fuel companies] could come into question," and that "this could potentially result in *a downgrade of more than one notch* if we were to place less reliance on undeveloped or probable reserves than at present" (emphasis ours). These possibilities are acknowledged by fossil fuel companies. In their 2012 annual report, Shell explains that: "continued public and political attention to climate change concerns, including existing and future regulatory frameworks to reduce greenhouse gas emissions, could result in increasing production costs, lengthening project implementation times and reducing demand for hydrocarbons."[423] They also claim that: "The management of emissions of carbon dioxide (CO_2) will become increasingly important as concerns over climate change lead to tighter environmental regulation."[424] In their 2013 annual report, BP states that: "Given the pressures in the sector, we expect regulation and taxation of the energy industry and energy users to increase in many areas in the future."[425]

New climate regulations are reasonably likely to be implemented in the years ahead. The Obama administration is expected to move forward with emissions limits on existing power plants.[426] [427] In anticipation of his June 25th 2013 climate speech, in which he was expected to announce restrictions on CO_2 emissions from existing coal plants, the stock price of major coal companies fell significantly: shares in Consol Energy fell 7.2 percent, those in Cliffs Natural Resources fell 7.6 percent, Peabody Energy's share price fell 7.2 percent, and those in Alpha Natural Resources fell 8 percent.[428] [429] President Obama pledged to regulate CO_2 emissions from existing power plants, promote the deployment of renewable energy, modernize the electrical grid, and further increase fuel economy standards for vehicles. The fall in the stock value of coal companies deepened after the details of the new Obama plan were announced.[430] The Government

[422] Redmond and Wilkins, *What A Carbon-Constrained Future Could Mean For Oil Companies' Creditworthiness*.
[423] Royal Dutch Shell PLC, *Building an Energy Future: Annual Report and Form 20-F 2012*, p. 14.
[424] Ibid., p. 47.
[425] BP PLC, *Building a stronger, safer BP: Annual Report and Form 20-F 2012*, p. 12.
[426] Broder, *Obama Readying Emissions Limits on Power Plants*.
[427] Executive Office of the President, *The President's Climate Action Plan*.
[428] Mufson, *Coal shares plunge ahead of Obama's climate-change speech*.
[429] All four companies are included in Appendix II: The 200 companies with the largest fossil fuel reserves
[430] Mitchell, *Obama climate change plan pounds coal stocks*.

of China may also be considering imposing a carbon tax.[431] Tightened regulations could pose a major risk for the value of fossil fuel companies. A study by HSBC concluded that: "Oil and gas majors, including, BP, Shell and Statoil, could face a loss in market value of up to 60 percent should the international community stick to its agreed emission reduction targets."[432]

There is a strong potential for malinvestment in capital-intensive, long-term projects

The IEA's 2012 *World Energy Outlook* concluded that, "more than two-thirds of current proven fossil-fuel reserves cannot be commercialized in a 2˚C world before 2050."[433] The Standard & Poor's Carbon Tracker Initiative study raises concerns concerning the fossil fuel sector: "This illustrates to us the apparent divergence between the assets owned by coal, oil, and gas companies and the direction of negotiations at UNFCCC conferences."[434] The study concludes that up to $6 trillion could be wasted in fossil fuel investments that become unviable because of tightened climate change policies globally.[435] As explained by the National Round Table on the Environment and the Economy (NRTEE):

> Every year of delay in sending strong, economy-wide policy signals represents a wasted opportunity to take advantage of natural cycles of infrastructure and equipment renewal, making it more difficult and expensive to meet emissions reduction targets. Our analysis shows that waiting until 2020 to implement climate policy aimed at cutting emissions by 65 percent from 2005 levels by 2050 implies close to $87 billion in refurbishments, retrofits and premature retirement of assets.[436]

Another study found that up to 75 gigawatts of coal-fired electricity capacity will need to be retired by 2030 because of tightened environmental regulations.[437] Investment in CO_2-emissions-enabling infrastructure is contrary to the international community's consensus about the direction of the future.[438]

The persistently high price of fuels on the world market in recent years has lead to unprecedented investment on the part of the fossil fuel industry in projects that were previously

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[431] Bajaj, *Taxing Carbon*.
[432] Jabusch, *The Economic Case for Divesting from Fossil Fuels*.
[433] International Energy Agency, *World Energy Outlook: 2012*.
[434] Redmond and Wilkins, *What A Carbon-Constrained Future Could Mean For Oil Companies' Creditworthiness*.
[435] Bakewell, *Carbon-Intensive Investors Risk $6 Trillion 'Bubble,' Study Says*.
[436] National Round Table on the Environment and the Economy, *Framing the Future: Embracing the Low-Carbon Economy*, p. 19.
[437] Lowe and Sanzillo, *Financial Risks of Investments in Coal*, p. 10.
[438] Watkins, *This gamble on carbon and the climate could trigger a new financial crisis*.

deemed too marginal to profitably develop. Development of unconventional hydrocarbon reserves such as tar sands, oil shale, offshore drilling in extremely deep water and the arctic, hydraulic fracturing, and mountaintop removal coal mining entails extremely high capital investment. Scenarios in which carbon emissions are restricted sufficiently to keep global temperatures from rising more than 2°C would likely cripple the return on much of this investment.

Carbon capture and storage cannot make fossil fuel extraction compatible with climate stability

In anticipating restrictions on carbon emissions, the fossil fuel industry has been pinning its hopes on the development of effective methods of carbon capture and sequestration (CCS). Despite tremendous investment in CCS technology from both the private and public sectors, economically feasible sequestration of emissions at scales needed to mitigate climate change remains elusive.[439] There are no commercial-scale CCS projects in operation on the planet, and in 2008 Cambridge Energy Research Associates (CERA) predicted that it would be another two decades before CCS saw large-scale deployment.[440] According to the Carbon Tracker Initiative, even if CCS is deployed in line with an idealised scenario by 2050, this would only extend fossil fuel carbon budgets by 12–14 percent, or just 4 percent of total global reserves.[441] It must be remembered that at the current rate of global carbon emissions, the entire budget of carbon emissions would be spent by the late 2020s, several years before large-scale CCS can be expected to come online.[442]

CCS has many other problems associated with it. For example, CCS would use extra energy, potentially as much as 40 percent of the electricity generated by a power station.[443] This reduces the efficiency of the power plant, both increasing financial costs and increasing the amount of fuel needed per energy output, which in turn contributes to the problems associated with fossil fuel extraction. Indeed, the increased cost of the energy provided by CCS-enabled power stations would likely be higher than the cost of energy from renewable sources, and so would almost certainly never be implemented.[444] Storing carbon underground is risky — safe and permanent storage of CO_2 cannot be guaranteed, and even very low leakage rates could undermine climate mitigation efforts.[445] Finally, money spent on CCS will divert investments away from sustainable solutions to climate change, which the world will need to transition to eventually, whether or not it burns all the

[439] For more information on CCS, see: Won't carbon capture and storage (CCS) save us?
[440] Cambridge Energy Research Associates, *Crossing the Divide: The Future of Clean Energy*.
[441] Carbon Tracker Initiative, *Unburnable Carbon 2013: Wasted capital and stranded assets*.
[442] Carbon Tracker Initiative, *Unburnable Carbon: Are the world's financial markets carrying a carbon bubble?*
[443] Greenpeace, *False Hope: Why carbon capture and storage won't save the climate*.
[444] Nelder, *Why carbon capture and storage will never pay off.*
[445] Greenpeace, *False Hope: Why carbon capture and storage won't save the climate*.

available (non-renewable) fossil fuels. Therefore, pinning our hopes on a non-existent technology, that is likely to both be more expensive and problematic than other energy sources, is a false hope.

Fossil fuel reserves as stranded assets

Given the degree to which proven reserves of carbon exceed allowable emissions for sub-2°C warming, companies whose largest assets are fossil fuel reserves may be substantially overvalued under current market conditions. Stranded assets in the form of unburnable reserves and large liabilities incurred to develop those reserves combine to create a risk not only to equity, but to bondholders as well. The Carbon Tracker Initiative reports that in 2012 the fossil fuel sector spent $674 billion prospecting for new sources of carbon, sources which cannot be exploited if the 2°C target is to be met.[446]

As the Carbon Tracker Initiative's 2012 report makes clear, fossil fuel companies have significantly more exploitable sources of carbon available than is safe to burn.[447] Therefore, when considering "What A Carbon-Constrained Future Could Mean For Oil Companies' Creditworthiness," Standard & Poor's decided that, "instead of considering issues of peak oil in terms of supply, this introduces a concept of peak oil demand."[448] Whether they took the form of tightened efficiency requirements, the establishment of a cap-and-trade scheme, or the promulgation of a carbon tax, enhanced climate regulations would generally have the objective of reducing fossil fuel demand. A reduction in oil, gas, and coal demand would have serious consequences for the fossil-fuel industry.[449]

As any investment manager knows, past performance does not guarantee future results, and it is becoming increasingly common for analysts and investors to discuss the prospect that the historical outperformance of fossil fuel companies may be similar to the tech boom of the 1990s and the housing bubble of recent years. However, the so-called "carbon bubble" potentially poses a much greater risk than either of these previous bubbles. "Conservative estimates for the financial worth of the unburnable carbon reserves have ranged from $20 trillion to $27 trillion, so any associated write-down of fossil-fuel company valuations could very easily dwarf the recent $2 trillion housing meltdown—by a full order of magnitude."[450] According to John Fullerton, founder and president of the Capital Institute, this multi-trillion "externality" presents civilization with a

[446] Carbon Tracker Initiative, *Unburnable Carbon 2013: Wasted capital and stranded assets*.
[447] Carbon Tracker Initiative, *Unburnable Carbon: Are the world's financial markets carrying a carbon bubble?*
[448] Redmond and Wilkins, *What A Carbon-Constrained Future Could Mean For Oil Companies' Creditworthiness*.
[449] Chan et al., *Canada's Bitumen Industry Under CO2 Constraints*.
[450] Humphreys, *Institutional Pathways to Fossil-Free Investing*, p. 3.

"Big Choice": "either we must absorb a $20tn write-off into our already stressed global economy over the next decade, or we will implicitly accept civilization transforming climate change."[451]

Volatility of investor sentiment

Current market capitalization of the fossil fuel industry rests in part on the assumption that global investors will continue to see the sector as a reliable investment even as damage from climate change becomes apparent. This assumption has been increasingly challenged from both outside and within the financial industry. Traditionally conservative-minded publications such as *The Economist*[452], *Business Week*[453] and the *Financial Times*[454] have published articles suggesting the fossil fuel sector is overvalued. In recent months, other voices within the financial industry such as investor groups and hedge fund managers have been increasingly sounding the alarm over the "Carbon Bubble".[455] *The Guardian* recently reported:

> The message to all the players across the financial chain, from ratings agencies through accountants, to actuaries, investment advisors and all the rest, is also obvious. If the regulators won't do their job, do it for them. *Jump, before you are pushed* (emphasis ours).[456]

The aforementioned Standard & Poor's study, which saw a declining trend on both the short-term and long-term outlook for fossil fuel companies (both mid-size and large), reached its conclusion without "explicitly [factoring in] any mitigating measures such as ... material cuts in near-term capital investment."[457] However, there is already a significant, international fossil-fuel divestment movement that could result in such material cuts: over 300 colleges and universities and over 100 cities and states have active divestment campaigns, along with several religious institutions.[458]

5.5 Fossil fuels represent a risk to the university's other investments

Institutional investors, and universities in particular, are required to plan financially on a timescale far longer than average. On timescales of 50 years or more, the consequences of unconstrained emissions are very likely to overshadow all other financial considerations. According

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[451] Fullerton, *The big choice: money or planet?*
[452] The Economist, *Unburnable fuel*.
[453] Bloomberg Businessweek, *Economist: Energy reserves overvalued by global markets*.
[454] Stern, *A profound contradiction at the heart of climate change policy*.
[455] Ibid.
[456] Leggett and McKibben, *How your pension is being used in a $6 trillion climate gamble*.
[457] Redmond and Wilkins, *What A Carbon-Constrained Future Could Mean For Oil Companies' Creditworthiness*.
[458] For detailed information on the status of active divestment campaigns, see: *Section 7.4 What are the University of Glasgow's peer schools doing?*

to a 2012 report by DARA, climate change is already costing the world more than $1.2 trillion, wiping 1.6 percent annually from global GDP. By 2030, the researchers estimate, the cost of climate change and air pollution combined will rise to 3.2 percent of global GDP, with the world's least developed countries forecast to bear the brunt, suffering losses of up to 11 percent of their GDP.[459] Going further into the future is increasingly hard to predict, with estimates varying widely: the Stern Review estimates losses of between 5-20 percent,[460] and a United Nations report asserts that climate change could cost Latin American and Carribean countries 137 percent of GDP by 2100.[461] However, regardless of the variations of predictions, the trend is clear: the more the climate changes, the greater the reductions to GDP. As the Stern Review explains, "[t]he benefits of strong, early action on climate change outweigh the costs".[462] Therefore, mitigating climate change can be expected to result in a relatively higher GDP, and to result in greater returns on the university's investments over the long term.[463]

In 2012, the NRTEE studied the risks posed to business by climate change. They identified many categories of associated risk, including fire and property damage, storms and other natural perils, business interruption, disease and disability, and liability claims.[464] The report concludes that: "some industries will be impacted significantly and permanently."[465] [466] In "Facing the Elements: Building Business Resilience in a Changing Climate", the NRTEE identifies the oil and gas sector, mining, agribusiness, retail and distribution, hydroelectricity, technology and communications, and financial services as industries at risk of being negatively impacted by climate change.[467]

A 2013 report prepared for the Global Investor Coalition on Climate Change explains that "[i]nstitutional investors are taking note of climate risks" and that "[t]he majority of respondents continue to view climate change as a material risk across their total portfolio and make reference to

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459 DARA International, *Climate Vulnerability Monitor: A Guide to the Cold Calculus of A Hot Planet*.
460 Stern, *The Economics of Climate Change: The Stern Review*.
461 Economic Commission for Latin America and the Caribbean, *Economics of Climate Change in Latin America and the Caribbean*.
462 Stern, *The Economics of Climate Change: The Stern Review*, Executive summary at: *http://www.hm-treasury.gov.uk/d/Executive_Summary.pdf*.
463 See also: Jabusch, *The Economic Case for Divesting from Fossil Fuels*.
464 National Round Table on the Environment and the Economy, *Managing the business risks and opportunities of a changing climate: A primer for executives on adaptation to climate change*, p. 3.
465 Ibid., p. 2.
466 See also: National Round Table on the Environment and the Economy, *Leveraging investments in climate science and impacts and adaptation research to support business responses to climate change today*.
467 National Round Table on the Environment and the Economy, *Facing the Elements: Building Business Resilience in a Changing Climate*, p. 9–10.

this in their investment policy."[468] [469] The report describes how:

> Climate risk analysis in equity portfolios for example is performed by almost 100% of respondents and real estate and infrastructure portfolios are receiving increasing levels of attention with respect to physical climate and policy or regulatory impacts. Around half of asset owners undertook a climate risk assessment at the portfolio level, and around half of these made changes to their investment activities as a result.[470]

The report further explains that "[a] number of respondents are either divesting or electing not to invest, based on climate change concerns."[471] [472]

5.6 Attractive substitutes exist for divested equities

There are many attractive alternatives that could form substantial portions of the university's portfolio. The renewable energy sector has strong growth potential and is starting to match conventional fossil-fuel energy prices (let alone unconventional energy prices). According to the NRTEE: "Public and private sectors need to mobilize investment in low-carbon infrastructure and technology."[473] Unsubsidised renewable energy is now cheaper than electricity from new-build coal- and gas-fired power stations in Australia, according to new analysis from research firm Bloomberg New Energy Finance.[474] Solar power is predicted to be cheaper than fossil fuel power in the U.S. As soon as 2015.[475] In March 2013, 100 percent of the new energy on the U.S. grid was solar power.[476]

There are three broad-based mutual funds that are completely fossil free: Green Century Balanced Fund (GCBLX), Portfolio 21 Global Equity Mutual Fund (PORTX), and Shelton Green Alpha Fund (NEXTX).[477] The GCBLX is solidly in the middle of its grouping regarding overall rating, returns and risk of the category,[478] and as mentioned earlier, the PORTX has actually out-

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[468] Global Investor Coalition on Climate Change, *Global Investor Survey on Climate Change: 3rd Annual Report on Actions and Progress*, p. 5, 7.
[469] See also: Yeo, *Fund managers worth $14tr say climate change influences investments*.
[470] Global Investor Coalition on Climate Change, *Global Investor Survey on Climate Change: 3rd Annual Report on Actions and Progress*, p. 6.
[471] Ibid., p. 6.
[472] See also: Vittorio, *Investors See Climate Change as Risk That Influences Decisions: Report*.
[473] National Round Table on the Environment and the Economy, *Framing the Future: Embracing the Low-Carbon Economy*, p. 17.
[474] Bloomberg New Energy Finance, *Renewable Energy Now Cheaper Than New Fossil Fuels in Australia*.
[475] GlobalData, *Grid Parity for Wind and Solar Power - Future Outlook and Impact Analysis*.
[476] Fleischfresser, *Solar power produced 100% of new energy on U.S. grid in March*.
[477] Fossil Free, *Move My Money*.
[478] Fidelity Investments, *GCBLX Summary - Green Century Balanced Fund*.

performed its peers.[479] The Shelton Green Alpha Fund only started recently, and hasn't yet received a rating.[480]

There is a body of credible evidence demonstrating that environmental, social, and governance (ESG) considerations often have a role to play in the proper analysis of investment *value*. As such they cannot be ignored, because doing so may result in investments being given an inappropriate value. A UNEP Finance Initiative report points out, "many people wonder what good an extra percent or three of patrimony are worth if the society in which they are to enjoy retirement and in which their descendants will live deteriorates."[481]

5.7 Pensions and climate change

Pensions are intended to allow the pensioner to enjoy a satisfactory, even comfortable, retirement. However, the more the climate changes, the lower the retirees' quality of life will be. A study conducted by the World Bank makes it clear that a 4˚C hotter world would be much more hostile than one in which there has only been a 2˚C rise, with 6˚C or greater rises being more hostile still.[482] The previous sections of this brief demonstrate that even a 2˚C rise will result in a greater frequency of natural disasters than the relative climate stability of the development of human civilisation thus far. Indeed, the world's top scientists have calculated that a concentration of CO_2 in the atmosphere that is higher than 350ppm is incompatible with the planet "on which civilization developed and to which life is adapted."[483] The relationship between pension obligations and climate change has already been acknowledged by financial analysts. In their report to the UNEP Finance Initiative, Freshfields Bruchhaus Deringer explain:

> Following the recent release of a report by Mercer Investment Consulting noting the financial impact that climate change has already had on companies' costs, revenues, assets and liabilities, the UK Carbon Trust expressed the view that 'Pension fund trustees have a duty to address the financial risk posed by climate change when making investment decisions.'[484]

The Carbon Trust report further explains that: "[i]t is crucial that actions to address climate risk be

[479] Fidelity Investments, *PORTX Summary - Portfolio 21 Global Equity Fund Class R*.
[480] Fidelity Investments, *NEXTX Summary - Shelton Green Alpha*.
[481] United Nations Environment Programme, *A legal framework for the integration of environmental, social and governance issues into institutional investment*.
[482] The World Bank, *Turn Down the Heat: Why a 4°C Warmer World Must be Avoided*.
[483] Hansen et al., *Target Atmospheric CO2: Where Should Humanity Aim?*
[484] United Nations Environment Programme, *A legal framework for the integration of environmental, social and governance issues into institutional investment*, p. 11.

taken by pension fund trustees" and "the impact of climate change on corporations is not just something to worry about over the longer-term, it is an issue to consider today."[485] [486]

In their report for the Canadian Centre for Policy Alternatives, Marc Lee and Brock Ellis also consider the special question of divestment and pension funds. They highlight how "[a]ddressing risk is inherent to financial market investment" but point out that "there has been a general failure to account for climate risks, and a tendency to view any screening for environmental purposes to be detrimental to financial performance."[487] They also argue that: "by not accounting for climate risk, large amounts of invested capital are vulnerable to the carbon bubble."[488] In assessing the university's obligation toward pensioners, it is also worth thinking beyond the simple metric of the financial performance of their pension funds. Unmitigated climate change is expected to cause substantial harm to both human prosperity and the quality of the natural environment around the world. In his comprehensive study of the economics of climate change, Nicholas Stern concluded that failing to mitigate climate change "create[s] risks of major disruption to economic and social activity... on a scale similar to those associated with the great wars and the economic depression of the first half of the 20th century."[489] Stern projected that up to 20 percent of global GDP could be swallowed up by damage from climate change. Since the publication of the Stern Review in 2007, Nicholas Stern has stated that they underestimated the threat in their assessment.[490] He has also drawn specific attention to the mismatch between the size of proven fossil fuel reserves and the quantity of fossil fuels that can be burned without exceeding the 2˚C target.[491] In evaluating its obligations to pensioners, the university must consider both their financial welfare (which is threatened by unmitigated climate change) and the kind of impoverished world future pensioners can be expected to inhabit if nothing is done to seriously constrain how much fossil fuel is burned.

It is in the best interests of the future pensioners of the University of Glasgow (its current employees) to live in a world with a stable climate. Elizabeth Sawin of the Sustainability Institute explains the long lifetime of GHGs in the atmosphere by comparing it with educational timelines. By the time a college president who is now 55 retires, 89 percent of the CO_2 released between 2012

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[485] Carbon Trust, *A Climate for Change: A Trustee's Guide to Understanding and Addressing Climate Risk*, p. 2, 10.
[486] See also: Michelson, *The Norwegian Government Pension Fund's investments in Canadian tar sands may be illegal, concludes a legal opinion*.
[487] Lee and Ellis, *Canada's Carbon Liabilities: The Implications of Stranded Fossil Fuel Assets for Financial Markets and Pension Funds*, p.8–9.
[488] Ibid., p.9.
[489] Stern, *The Economics of Climate Change: The Stern Review*, See also: http://www.hm*treasury.gov.uk/d/Executive_Summary.pdf*.
[490] Adam, *I underestimated the threat, says Stern*.
[491] Stern, *A profound contradiction at the heart of climate change policy*.

and 2016 would remain in the atmosphere. The same article also highlights the perspective of students:

> Even if today's university students live to be 100 years old, more than half of the CO_2 released into the atmosphere during the four years they are in college will still be present there at the end of their lives — warming the planet and contributing to extreme events, like droughts, floods, and storms all the while — long after the decision makers behind those investment choices will have left office. The college students across the US who are arguing that their education should not be funded by actions that diminish the health of the world in which their future will unfold have a strong case, supported by the basic physics of the climate.[492]

James Powell, former-president of Oberlin, Franklin and Marshall, and Reed College, further reinforces this concept, suggesting that trustees have a quasi-legal duty to do all they can about climate change: "The board is supposed to make sure that the endowment allows for intergenerational equity, that the students who are going to Oberlin in 2075 get as much benefit from it as those there now. But with global warming, you're guaranteeing a diminution of quality of life decades out."[493]

Therefore, not only is divestment from the fossil fuel industry a sound financial decision for meeting the financial obligations of prudent investment, the current employees of the University of Glasgow will benefit from such divestment.

5.8 The significance of the University of Glasgow's investments

The University of Glasgow has significant holdings in fossil fuel companies. According to the university's most recent Annual List of Investments, from July 31st 2013, the university holds shares in BHP Billiton PLC, BP PLC, Chevron Corp., National Grid PLC, Royal Dutch Shell PLC, Centrica PLC, Statoil Hydro ADA, Scottish and Southern Energy PLC, and Total SA. The total market value of these shares as of January 15th 2014 was £18,574,999. Although the precise quantity and value of the investments are likely to change daily, fossil fuel reserves make up approximately 12.5 percent of the University of Glasgow's total endowment.

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[492] Sawin, *Carbon Dioxide Will Persist in the Atmosphere Long After Current Decision Makers Have Left Their Roles: On Ethical Grounds, Young People Should Have a Say*.

[493] McKibben, *The Case for Fossil-Fuel Divestment*.

The Carbon Tracker report list the world's top 200 fossil fuel companies by proven carbon reserves. These are listed in the appendix. Most of the 200 companies listed are primarily fossil-fuel companies, and collectively they possess a quantity of fossil fuels sufficient to breach the 2˚C barrier and impose dangerous climate change on the rest of the world. In most if not all cases, more than ten percent of the revenues of the 200 listed firms are derived from the undesirable activity of fossil fuel production. The University of Glasgow also invests in companies which are not listed by the Carbon Tracker report, such as Centrica and Scottish & Southern Energy, but which are undoubtedly fossil fuel companies. If the University of Glasgow decided to divest, it would have an impact out of proportion with how much of each firm's market capitalization is owned by the university. This is because of the important signal divestment would send to the university's peer schools, as well as to other institutional investors.

5.9 Towards divestment

Many resources now exist to guide those who are considering fossil fuel divestment. In addition, asset managers, indexing firms, and other financial intermediaries are rapidly developing new products and services to respond to investor demand for fossil-free investment options. The following resources provide valuable guidance:

• Institutional Pathways to Fossil-Free Investing by Joshua Humphreys[494]
• Resilient Portfolios & Fossil-Free Pensions by HIP Investor Inc. and GoFossilFree.org[495]
• Divestment from Fossil Fuels: A guide for city officials and activists[496]

[494] Humphreys, *Institutional Pathways to Fossil-Free Investing*.
[495] HIP Investor, *Resilient Portfolios & Fossil-Free Pensions*.
[496] Mayor's Innovation Project, *Divestment from Fossil Fuels: A guide for city officials and activists*.

6 | Actions have been taken by the UK government and international bodies on this issue

6.1 From the University of Glasgow's Policy on Socially Responsible Investment

The key criterion against which specific cases would be considered would be whether the activity complained of and substantiated by the concerned group, was wholly contrary to the University's value systems either as reflected in the Mission Statement or the Strategic Plan or in regard to wider issues of social, environmental and humanitarian concern.

In this section, actions taken by the UK government and international bodies to mitigate climate change are outlined, showing that climate change and the fossil fuel industry's impact are regarded as issues of wider social, environmental and humanitarian concern.

6.2 UK government

The *Climate Change Act 2008* made the U.K. the first country in the world to have a legally binding long-term framework to cut carbon emissions.[497] It introduced a long-term framework for managing emissions through a system of national carbon budgets: caps on the total quantity of GHG emissions permitted in the U.K. over a specified time.[498] Each carbon budget covers a five year period, with the first three carbon budgets running from 2008 to 2012, 2013–2017, and 2018–2022.[499] During these periods, emissions must be reduced (from 1990 levels) by 22 percent, 28 percent, and 34 percent.[500] The act also created a framework for building the U.K.'s ability to adapt to climate change, including:

- A U.K.-wide Climate Change Risk Assessment that must take place every five years,

[497] Department of Energy and Climate Change, *The UK's Fifth National Communication under the United Nations Framework Convention on Climate Change*.
[498] Ibid.
[499] Ibid.
[500] Ibid.

- A National Adaptation Programme which must be put in place and reviewed every five years to address the most pressing climate change risks to the U.K.,
- A mandate giving the government the power to require "bodies with functions of a public nature" and "statutory undertakers" (such as water and energy utilities) to report on what they are doing to address the risks posed by climate change to their work.[501]

The U.K. Department of Energy & Climate Change has set the following national policies and strategies for combating climate change:

- Setting carbon budgets to limit the amount of GHGs the U.K. is allowed to emit over a specified time
- Using statistics on GHG emissions and further evidence, analysis and research to inform energy and climate change policy
- Using the European Union Emissions Trading Scheme (EU ETS) to meet over 50 percent of the UK's carbon emissions reduction target between now and 2020
- Using a set of values for carbon to make sure project and policy appraisals account for their climate change impacts
- Using the 2050 Calculator to let policy makers and the public explore the different options for meeting the 2050 emissions reduction targets[502] [503]

Reducing the demand for energy and helping people and businesses to use energy more efficiently:

- Reducing demand for energy with smart meters and other energy-efficient measures for industry, businesses, and the public sector
- Reducing emissions by improving the energy efficiency of properties through the Green Deal

[501] Department of Energy and Climate Change, *The UK's Fifth National Communication under the United Nations Framework Convention on Climate Change*.
[502] Government of the United Kingdom, *Reducing the UK's greenhouse gas emissions by 80% by 2050*.
[503] Government of the United Kingdom, *EU Emissions Trading System (EU ETS).*

- Providing incentives for public and private sector organisations to take up more energy-efficient technologies and practices through the CRC Energy Efficiency Scheme
- Reducing GHGs and other emissions from transport
- Reducing GHG emissions from agriculture[504]

Investing in low-carbon technologies:

- Taking action to increase the use of low-carbon technologies and creating an industry for carbon capture and storage
- Reducing emissions from the power sector and encouraging investment in low-carbon technologies by reforming the U.K.'s electricity market
- Providing over £200 million of funding for innovation in low-carbon technologies from 2011 to 2015[505]

Publicly reporting carbon emissions from businesses and the public sector:

- Encouraging corporate reporting of GHG emissions
- Asking English local authorities to measure and report their GHG emissions[506]

6.3 Scottish Government

Scotland has passed the Climate Change (Scotland) Act 2009, which sets the goal for an 80 per cent reduction of greenhouse gas emissions by 2050, with an interim goal of 42 per cent reduction by 2020.[507] The Act also requires public bodies to operate:

- In the way best calculated to contribute to delivery of the Act's emission reduction targets
- In the way best calculated to deliver any statutory adaptation programme
- In the way that it considers most sustainable.[508]

[504] Government of the United Kingdom, *Reducing the UK's greenhouse gas emissions by 80% by 2050*.
[505] Ibid.
[506] Ibid.
[507] Scottish Government, *Climate change (Scotland) Act 2009.*

Renewables policy The goal is that renewable sources, "generate the equivalent of 100 per cent of Scotland's gross annual electricity consumption by 2020", and "11 per cent of Scotland's heat demand by 2020".[509]

Environmental Impact The Scottish government aims at reducing its "local and global environmental impact of our consumption and production." [510] To achieve this, the Scottish Government is prepared to do the following, next to the policies already outlined:

- Ensure that policy options and public spending decisions contribute to reducing emissions and to the action needed help mitigate climate change
- Funds initiatives by farmers and others to reduce climate change emissions from land management practices and to manage our rural environment more effectively
- Support the delivery of ten megawatts of marine energy from our waters by 2010, helping to make Scotland the world leader in wave and tidal power
- Triple the funding for community renewables and microgeneration to reach £13.5 million a year by 2010-11
- Ensure the Forestry Commission can invest £15 million a year in new woodlands to help increase forest cover to 25 per cent as rapidly as possible
- Vigorously pursue delivery of the zero waste policy. As set out on the national zero waste plane […]
- Establish a Climate Challenge Fund to inspire community-based action to tackle climate change […]
- Address the challenge of sustainable food in a new National Food Policy […]
- Invest in public transport; and support local authorities with plans for communities that are less car-dependent and incorporate green space that encourages more walking and cycling
- Publish Scotland's Climate Chang Adaptation Strategy to ensure an effective response to the unavoidable impacts of climate change in order to safeguard our communities, and protect Scotland's long-term environmental and economic prosperity [...][511]

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[508] Scottish Government, *Public Bodies Duties.*
[509] Scottish Government, *Renewables Policy.*
[510] Scottish Government, *Environmental Impact.*
[511] Ibid.

6.4 City of Glasgow

The City of Glasgow has introduced its Climate Change Strategy & Action Plan in 2010, outlining measures it intends to take in order to mitigate climate change.[512]

The Strategy outlined in this plan is as follows:

- Takes account of current EU, UK and Scottish legislation on Climate Change;
- Builds on the Council's existing plans and policies and will encourage a carbon neutral approach to its future services and activities;
- Sets out options to reduce CO2 emissions and take additional measures to enable Glasgow's business community and citizens to adapt to climate change;
- Aims to reduce Glasgow's carbon emissions by 20% by 2012; and
- Is a live document which will continue to evolve as further guidance and policies are issued by the Scottish Government and others"[513]

The objectives of the Glasgow Climate Change Strategy & Action Plan are:

- Health and well-being: "to improve health and well-being and to contribute to reducing health inequalities by mitigating against the disproportionate negative health impacts of climate change, in particular for groups such as the very young, the elderly, and those living in poverty."[514]
- Education and awareness: "to raise awareness of climate change in a way that enables all of Glasgow's citizens to take local action acknowledging global consequences."[515]
- Energy: "To raise awareness of energy issues and promote energy efficiency to reduce the consumption of fossil fuel-bases power, integrating the use and development of renewable

[512] Glasgow City Council, *Climate change strategy & action plan.*
[513] Ibid. p. 12.
[514] Ibid. p. 13.
[515] Ibid. p. 18.

energy into all activities within the Council, its partner organisations and throughout the City."[516]

- Resource management: "to increase waste minimisation, increase waste recycling in line with Single Outcome Agreement targets and significantly reduce current reliance on landfill though innovative management techniques and increase staff and public awareness of the impact resource management practices have on climate change."[517]
- Transport: "To increase the use of more sustainable modes of travel thereby reducing the use of fossil fuels and the negative effects of exhaust pollution on Climate Change."[518]
- Sustainable Procurement: "to develop a Sustainable Procurement Policy to promote and raise awareness, in our staff, citizens and suppliers, of the Climate Change implications of our Services purchasing decisions and to encourage more sustainable options thus delivering best value for the citizens of Glasgow."[519]
- Cultural and natural heritage: "to provide and sustain a robust and functional environment that celebrates the City's unique identity and helps communities (whether human or wildlife) to adapt to climate change. To manage the environment in a way that minimises carbon output and engages local people and visitors in the stewardship of the City's cultural and natural resources."[520]
- Water: "To reduce water consumption in Glasgow City Council's premises and in the wider community, while improving water quality. To improve flood prevention infrastructures, while encouraging people to be prepared for this risk. To comply with the Flood Risk Management (Scotland) Act 2009."[521]
- Planning and built environment: "to ensure that the development and regeneration of the City is undertaken in a manner that embraces the principles of sustainable design and construction, thereby ensuring the City also functions in a manner that addresses the likely impacts of climate change."[522]

Sustainable Glasgow: "a partnership between the public sector, higher education and industry", with the goal to turn Glasgow into one of the most sustainable cities in Europe within 10 years. This includes not only the achievement of the 80% reduction of GHG emissions by 2050, but a broader

[516] Ibid. p. 22.
[517] Ibid. p. 25.
[518] Glasgow City Council, *Climate Change Strategy & Action Plan,* p. 30.
[519] Ibid. p. 37.
[520] Ibid. p. 41.
[521] Ibid. p. 45.
[522] Ibid. p. 49.

approach, which aims at the transformation of the energy sector, waste, transportation and behavioural change.[523] [524]

6.5 Actions taken by other national bodies

The extensive actions undertaken by other countries demonstrates the seriousness of climate change. Many have implemented significant and ambitious policies. This action demonstrates how, in the view of the world's major governments; the need to mitigate climate change is not properly the subject of academic inquiry and debate.

United States

Federal government

At the federal level, under the leadership of President Obama, the White House has taken many steps toward mitigating and adapting to climate change.[525] [526] [527]

Monitoring Emissions The United States is comprehensively cataloguing greenhouse gas emissions from its largest emitting sources.[528]

Government Procurement and Energy Consumption President Obama directed the Federal Government — the largest energy consumer in the U.S. economy — to reduce its greenhouse gas emissions from direct sources such as building energy use and fuel consumption by 28 percent by

[523] Glasgow City Council, *Sustainable Glasgow.*
[524] Sustainable Glasgow, *Sustainable Glasgow Report 2010.*

[525] The White House, *Climate Change*.
[526] The White House, *Climate Change Adaptation Task Force*.
[527] The White House, *Develop and Secure America's Energy Resources*.
[528] United States Environmental Protection Agency, *Greenhouse Gas Reporting Program*.

2020.[529] He also directed federal agencies to reduce their greenhouse gas emissions from indirect sources, such as those from employee commuting, by 13 percent by 2020.[530]

Climate Change Adaptation Task Force (CCATF) and the U.S. Global Change Research Program (USGCRP) The CCATF advises on how federal agency policies and programs can better prepare the United States to address the risks associated with a changing climate.[531] The USGCRP is a collaborative effort involving 13 federal agencies to evaluate the current and future impacts of climate change, inform policy-makers and the public about scientific findings, and investigate effective ways to reduce greenhouse gas emissions and deploy cost-effective clean energy technology.[532]

Investing in Clean Energy With the support of administration policy, the U.S. has nearly doubled renewable energy generation from wind, solar, and geothermal sources since 2008.[533] Since 2009, the Department of Interior has approved 29 onshore renewable energy projects, including 16 solar, 5 wind, and 8 geothermal projects.[534] Moving forward, the Department of Interior is committed to issuing permits for 10,000 megawatts of renewable power on public lands and in our offshore waters by the end of 2012, enough to power 3 million homes.[535] In 2010, President Obama also set a goal of breaking ground on at least four commercial scale cellulosic or advanced biorefineries by 2013.[536] That goal was accomplished a year ahead of schedule.[537]

Smart Grid In 2011, the administration announced that it would accelerate the permitting review of seven proposed electric transmissions lines.[538] These infrastructure projects, when built, will increase grid capacity, facilitating better integration of renewable energy sources, avoiding

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529 Council on Environmental Quality, *Federal Leadership in Environmental, Energy and Economic Performance - Executive Order 13514*.
530 Ibid.
531 The White House, *Climate Change Adaptation Task Force*.
532 United States Global Change Research Program, *About*.
533 The White House, *Obama Administration Record on an All-of-the-Above Energy Strategy*.
534 Ibid.
535 United States Department of the Interior, *Salazar Authorizes Landmark Wyoming Wind Project Site*.
536 The White House, *Obama Administration Record on an All-of-the-Above Energy Strategy*.
537 Ibid.
538 United States Department of Energy, *Obama Administration Announces Job-Creating Grid Modernization Pilot Projects*.

blackouts, and helping to accommodate the growing number of electric vehicles on the road.[539] The administration also launched a Green Button initiative in 2011 to empower Americans to reduce energy use in their homes.[540] Already, utilities across the country have committed to providing 27 million households with access to data about their own energy use with a simple click of an online "Green Button" that will help them reduce waste and shrink their energybills.[541]

Clean Energy Research & Development In 2009, the administration funded the Department of Energy's Advanced Research Project Agency-Energy (ARPA-E), which focuses on "out-of-the-box" transformational energy research that brings together the nation's best scientists, engineers, and entrepreneurs.[542] Building upon the initial investment, in late September 2011, the ARPA-E program announced 60 cutting-edge research projects in 25 states.[543] In total, The ARPA-E has supported more than 120 individual projects.[544]

Clean Energy Innovation Hubs The administration also launched a series of clean energy innovation hubs, which bring together teams of the best researchers and engineers in the U.S. to solve major energy challenges.[545]

The hubs will focus on improving batteries and energy storage, reducing constraints from critical materials, developing fuels that can be produced directly from sunlight, improving energy efficient building systems design, and using modelling and simulation for advanced nuclear reactor operations.[546]

The President's Better Buildings Challenge The President's Better Buildings Challenge has set a goal of improving the energy efficiency of commercial buildings by 20 percent by 2020.[547] The

[539] Ibid.
[540] Office of Science and Technology Policy, *Green Button: A Smart Decision*.
[541] Ibid.
[542] Wurzelmann, "Advanced Research Projects Agency - Energy (ARPA-E): Innovation Through the U.S. Department of Energy".
[543] Advanced Research Projects Agency, *Department of Energy Awards $156 Million for Groundbreaking Energy Research Projects*.
[544] Ibid.
[545] United States Department of Energy, *Energy Innovation Hubs: Achieving Our Energy Goals with Science*.
[546] United States Department of Energy, *Energy Innovation Hubs*.
[547] United States Department of Energy, *Progress Update Spring 2013*.

administration has also partnered with manufacturing companies, representing over 1,400 plants, to improve energy efficiency by 25 percent over 10 years.[548]

In June 2013, President Obama announced a new climate change action plan.[549] Among the substantive commitments, it included a promise to set limits for CO2 emissions from existing power plants — the largest source of GHG pollution in the U.S. The plan also includes accelerated permitting for renewable energy, energy grid modernization, further increases to vehicle fuel efficiency standards, curbs on the release of hydrofluorocarbons and methane, as well as new energy efficiency initiatives.

The Environmental Protection Agency

The EPA develops standards for greenhouse gas emissions from mobile and stationary sources under the *Clean Air Act*.[550] Its federal regulatory activities are in addition to its volunteer water monitoring programs, international partnerships, and partnerships with states and tribes.[551] [552]

Standards to Cut Greenhouse Gas Emissions and Fuel Use for New Motor Vehicles The EPA is enabling the production of a new generation of clean vehicles — from the smallest cars to the largest trucks — through reduced GHG emissions and improved fuel use.[553] Together, the enacted and proposed standards are expected to save more than six billion barrels of oil through 2025 and reduce more than 3,100 million metric tonnes of carbon dioxide emissions.[554]

Renewable Fuel Standard (RFS) Program A set of regulations to ensure that transportation fuel sold in the U.S. contains a minimum volume of renewable fuel.[555] By 2022, the RFS program will reduce greenhouse gas emissions by 138 million metric tonnes, about the annual emissions of 27 million passenger vehicles, replacing about seven percent of expected annual diesel consumption.[556]

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[548] Ibid.
[549] Executive Office of the President, *The President's Climate Action Plan*.
[550] United States Environmental Protection Agency, *Air Enforcement*.
[551] United States Environmental Protection Agency, *EPA's Volunteer Monitoring Program*.
[552] United States Environmental Protection Agency, *About the Office of International and Tribal Affairs*.
[553] United States Environmental Protection Agency, *Regulatory Initiatives*.
[554] Ibid.
[555] Ibid.
[556] Ibid.

Proposed Carbon Pollution Standard for New Power Plants On March 27 2012, the EPA proposed a Carbon Pollution Standard for New Power Plants that would, for the first time, set national limits on the amount of carbon pollution that power plants can emit.[557] The proposed rule, which applies only to new fossil-fuel-fired electric utility generating units, will help ensure that current progress continues toward a cleaner, safer, and more modern power sector.[558]

Oil and Natural Gas Air Pollution Standards On April 18 2012, the EPA finalized cost-effective regulations to reduce harmful air pollution from the oil and natural gas industry, while allowing what they consider to be responsible growth in U.S. oil and natural gas production.[559] The final rules are expected to yield a nearly 95 percent reduction in VOC emissions from more than 11,000 new hydraulically fractured gas wells each year.[560] The rules will also reduce air toxics and emissions of methane, a potent GHG.[561]

Geologic Sequestration of Carbon Dioxide The EPA has finalized requirements for geologic sequestration, including the development of a new class of wells, Class VI, under the authority of the *Safe Drinking Water Act*'s Underground Injection Control Program.[562]

The EPA is also taking adaptation measures. These include:

- The Climate Ready Estuaries program works with the National Estuary Programs and the coastal management community to: (1) assess climate change vulnerabilities, (2) develop and implement adaptation strategies, and (3) engage and educate stakeholders.[563]
- The EPA's Climate Ready Water Utilities initiative assists the water sector, which includes drinking water, wastewater, and stormwater utilities, in addressing climate change impacts.[564] Some federal departments are also taking actions specific to their purview. For

[557] Ibid.
[558] Ibid.
[559] United States Environmental Protection Agency, *Regulatory Initiatives*.
[560] Ibid.
[561] Ibid.
[562] United States Environmental Protection Agency, *Regulatory Initiatives*.
[563] United States Environmental Protection Agency, *Water: Climate Ready Estuaries*.
[564] United States Environmental Protection Agency, *Climate Ready Water Utilities (CRWU)*.

example, the Department of Transportation's (DOT) Congestion Mitigation and Air Quality (CMAQ) Improvement Program provides over $8.1 billion dollars in funds to state DOTs, metropolitan planning organizations, and transit agencies to invest in projects that reduce emissions from transportation-related sources.[565] [566] Since October 2009, the Department of Energy and the Department of Housing and Urban Development have jointly completed energy upgrades in more than one million homes across the country.[567]

Germany

Targets

In the framework of EU effort sharing under the *Kyoto Protocol*, Germany has committed itself to cutting its emissions of climate-damaging gases by a total of 21 percent in the period 2008 to 2012 compared with 1990.[568] In addition, Germany has pledged to reduce its GHG emissions by 40 percent by 2020, 55 percent by 2030, 70 percent by 2040, and by 80–95 percent by 2050 (compared with 1990 levels).[569] Germany has also set ambitious targets for

increasing the share of renewable energy in final energy consumption, by 18 percent by 2020, 30 percent by 2030 and by 60 percent by 2050.[570] Between 2008 and 2012, the portion of German electricity derived from renewable sources rose from 15 percent to 22 percent.[571] It is expected to reach 48 percent by 2022.[572]

Emissions Trading

Emissions trading in particular makes a significant contribution to emissions reductions in Germany. The climate protection targets for the period 2008 to 2012 have been made significantly

[565] United States Department of Transportation, *CMAQ and SAFETEA-LU*.
[566] United States Department of Transportation, *Congestion Mitigation and Air Quality Improvement (CMAQ) Program*.
[567] The White House, *Develop and Secure America's Energy Resources*.
[568] European Commission, *Kyoto emissions targets: Joint fulfillment, 'burden sharing' and base years*.
[569] German Missions in the United States, *Key Messages on German Climate and Energy Policy*.
[570] Ibid.
[571] The Economist, *Tilting at windmills*, p. 12.
[572] Ibid.

more stringent: from 2008, old power plants in Germany will be allocated around 30 percent fewer emission allowances.[573] Furthermore, 10 percent of the allowances will be auctioned.[574]

Feed-In Tariff

The use of an adequate, long-term, and predictable feed-in tariff encourages the construction of many renewable energy production sites.[575] The differentiated feed-in tariff has fostered deployment of a diversified range of renewable energy technologies.[576]

Integrated Energy and Climate Programme (IECP)

In order to reach the German climate protection goals the federal government has implemented a comprehensive IECP.[577] Its goal is to ensure an ultra-modern, secure, and climate-friendly energy supply in Germany.[578] It comprises measures for enhanced energy efficiency and expanded use of renewable energy sources.[579]

Measures contained in the IECP include:

Amendment to the *Combined Heat and Power Act* By 2020, the share of high-efficiency CHP plants in electricity production will be doubled from the current level of around 12 percent to around 25 percent.[580]

Amendment to the *Energy Industry Act* Liberalising electricity metering will facilitate and promote innovative metering methods and demand-related, time-variable tariffs.[581] This will enable

[573] German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety, *The Integrated Energy and Climate Programme of the German Government*.
[574] Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, *General Information - Emissions Trading*.
[575] Höhne, Niklas and Geurts, Fieke and Teckenburg, Eva, *Germany*.
[576] Ibid.
[577] Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, *General Information - Climate Protection*.
[578] Ibid.
[579] Ibid.
[580] German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety, *The Integrated Energy and Climate Programme of the German Government*.

consumers to reduce their energy costs and will improve the efficiency of the power generation sector.[582]

Report and draft amendment to the *Energy Saving Ordinance* Energy standards will be tightened by an average 30 percent from 2009.[583] As a second step (planned for 2012), these efficiency standards will be tightened by a further 30 percent.[584]

Clean power plants Standards will be laid down for nitrogen oxide emissions from new power plants.[585]

Guidelines on the procurement of energy-efficient products and services Energy-efficient appliances and services will be promoted through priority procurement.[586]

Amendment to the *Renewable Energy Sources Act* The government's goal is to increase the share of renewables in the electricity sector from the current level of over 13 percent to 25–30 percent in 2020, and then to continue increasing the level further.[587]The amendment to the *Renewable Energy Sources Act* contains among other things new provisions for regulating tariffs for offshore wind farms.[588]

Renewable Energies Heat Act The share of renewable energies in heat provision will be increased to 14 percent by 2020.[589] Obligations to use renewable energies in new buildings are laid down in the *Renewable Energies Heat Act*.[590] Funding for the government support programme for existing

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[581] Ibid.
[582] Ibid.
[583] Ibid.
[584] Ibid.
[585] Ibid.
[586] Ibid.
[587] German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety, *The Integrated Energy and Climate Programme of the German Government*.
[588] Ibid.
[589] Ibid.
[590] Ibid.

buildings will increase — from 130 million euro in 2005 to up to 350 million in 2008 and up to 500 million euro from 2009.[591]

Amendment to the *Gas Grid Access Ordinance* This amendment is intended to ensure that biogas can be fed into the natural gas grid to a greater extent.[592] A share of 10 percent biogas is possible by 2030.[593]

Amendment to the *Biofuel Quota Act* The share of biofuels will be increased and from 2015 will be geared more towards reducing GHG emissions.[594] The amendment to the *Biofuel Quota Act* will lead to a rise in the biofuels' hare to around 20 percent by volume (17 percent by energy content) by the year 2020.[595]

Sustainability Ordinance The ordinance will ensure that when producing biomass for biofuels, minimum requirements for sustainable management of agricultural land and for the conservation of natural habitats are complied with.[596]

Fuel Quality Ordinance The amended ordinance will increase the blending limit of bioethanol in petrol fuels from 5 to 10 percent by volume.[597] For biodiesel in diesel fuels, this blending limit will increase from 5 to 7 percent by volume.[598]

Reform of vehicle tax to a pollutant and CO2 basis For new vehicles, this tax will then be calculated on the basis of a vehicle's emissions rather than engine capacity as before.[599]

[591] Ibid.
[592] Ibid.
[593] Ibid.
[594] Ibid.
[595] Ibid.
[596] Ibid.
[597] Ibid.
[598] Ibid.
[599] German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety, *The Integrated Energy and Climate Programme of the German Government*.

Chemicals Climate Protection Ordinance This ordinance will reduce emissions of fluorinated GHGs from mobile and stationary cooling installations through provisions on leakproofness and labelling of the installations and on recovery and return of the refrigerants used.[600]

China

China has surpassed the U.S. as the world's largest greenhouse gas emitter. Nonetheless, the actions of the Chinese government show an increasing willingness to take climate change mitigation seriously.[601] In 2011, China was the world leader in renewable energy technology investments, spending US$52 billion.[602] In June 2013, the Chinese government announced that it would spend US$275 billion over five years on reducing air pollution — equivalent

to the GDP of Hong Kong or twice China's annual defence budget.[603]

Targets

Under China's 12th Five Year Plan, the government set binding targets to reduce energy consumption per unit of GDP by 16 percent, cut CO2 emissions per unit of GDP by 17 percent, and raise the proportion of non-fossil fuels in the overall primary energy mix to 11.4 percent.[604] At the Copenhagen Climate Change Summit in 2009, the Chinese

government signalled its goal to reduce the carbon emissions intensity per unit of GDP by 40–45 percent from 2005 levels by 2020.[605] [606]

In March 2013, China introduced new vehicle fuel efficiency standards of 6.9 litres per 100 km by 2015 and 5.0 litres per 100 km by 2020.[607]

Transformation and upgrading of traditional industries

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[600] Ibid.
[601] Jones, *China tops CO2 emissions*.
[602] Forbes, *China Leads The World In Renewable Energy Investment*.
[603] The Economist, *China and the environment: The East is grey*, p. 18.
[604] Centre for Climate and Energy Solutions, *Energy and Climate Goals of China's 12th Five-Year Plan*.
[605] United Nations Development Programme, *Human Development Report 2013: The Rise of the South: Human Progress in a Diverse World*, p. 108.
[606] Centre for Climate and Energy Solutions, *Energy and Climate Goals of China's 12th Five-Year Plan*.
[607] The Economist, *Supermajordammerung*, p. 21.

China plans to conserve energy and cut emissions by optimizing and upgrading its industrial structure.[608] The government has stepped up evaluation and examination of energy conservation, environmental impact assessments, and preliminary examination of land used for construction projects.[609] It has raised the entry threshold for certain industries and limited new projects in industries with high energy consumption, high pollutant emissions, or excess capacity.[610] It has also controlled the export of products with high energy consumption and high pollutant emissions.[611]

Over the past five years, Chinese carbon emissions per unit of GDP (energy intensity) fell by about 20%. The government aims to cut them by 40–45% by 2020, mostly by ordering energy efficiency improvements in state-owned enterprises. In terms of the absolute scale of GHG pollution reduction that would result, *The Economist* describes the plan as "arguably the single most important climate policy in the world".[612]

Supporting the development of strategic and newly emerging industries

China has established a special fund to boost the development of strategic emerging industries, and expanded its venture capital program for emerging industries.[613] So far 102 venture capital funds have been set up under the program, managing a total of 29 billion yuan.[614] Among these funds, 24, with a total value of 7 billion yuan, are designed to stimulate the development of the energy-saving, environmental protection and new energy sectors.[615]

China invested US$76 billion in renewable energy in 2012, three times the amount invested in Germany. China aims to get 20 percent of its energy from renewable sources by 2020, and to have 100 gigawatts of wind capacity and 35 gigawatts of solar capacity by 2015.[616]

Carbon pricing

[608] China.org.cn, *China curbs CO2 emissions through industrial restructuring*.
[609] Ibid.
[610] Ibid.
[611] Ibid.
[612] The Economist, *China and the environment: The East is grey*, p. 21.
[613] China.org.cn, *Mitigating Climate Change*.
[614] Ibid.
[615] Ibid.
[616] The Economist, *China and the environment: The East is grey*, p. 21.

Although this was not included in China's 12th Five Year Plan, there have been reports that the Chinese government will be introducing a carbon tax on major energy consumers before the end of the plan.[617] It is estimated that the tax would begin at 10 yuan ($1.59) per tonne of CO2 emitted, and would increase depending on the company's emission levels (information is not yet available on the details of the tax increases).[618]

Five Chinese cities (Shanghai, Beijing, Shenzhen, Tianjin, and Chongqing) and two provinces (Guangdong and Hubei) are preparing pilot emissions trading schemes, set to begin in 2013.[619] [620] The Chinese government has ordered these areas to set GHG emission control targets, and to implement an emissions trading scheme in order to meet

these targets.[621] This pilot project is considered to be an important learning step, leading up to the implementation of a national emissions trading scheme by 2015.[622]

India

India's 2007 Integrated Energy Policy includes policies, regulations, and legislation intended to promote climate change mitigation. This includes the promotion of energy efficiency in all sectors, an emphasis on mass transport, an emphasis on renewables including biofuels plantations, provisions for the accelerated development of nuclear and hydroelectric power power, and focused research and development on clean energy related technologies.

On June 30th 2008, the Prime Minister's Council on Climate Change released the first National Action Plan on Climate Change.[623] [624] The plan outlines existing and future policies and programs intended to advance climate mitigation and adaptation. The plan "identifies measures that promote our development objectives while also yielding co-benefits for addressing climate change effectively" and includes 8 'missions' which are to run through 2017:

- National Solar Mission
- National Mission for Enhanced Energy Efficiency

[617] Stanway, David, *China to levy carbon tax before 2015 - Report*.
[618] Ibid.
[619] Lutenegger, Brian, *Issue Brief: China's Actions on Clean Power*.
[620] The Economist, *China and the environment: The East is grey*, p. 21.
[621] Lutenegger, Brian, *Issue Brief: China's Actions on Clean Power*.
[622] Ibid.
[623] Government of India, Prime Minister's Council on Climate Change, *National Action Plan on Climate Change*.
[624] See also: Center for Climate and Energy Solutions, *Summary: India's National Action Plan on Climate Change*.

- National Mission on Sustainable Habitat
- National Water Mission
- National Mission for Sustaining the Himalayan Ecosystem
- National Mission for a Green India
- National Mission for Sustainable Agriculture
- National Mission on Strategic Knowledge for Climate Change

In 2010, India announced voluntary targeted reductions of 20–25 percent in carbon intensity.[625]

France

Targets

France continues to support the targets stipulated in the *Kyoto Protocol* and sees the *UNFCCC* as a primary body through which climate change negotiations will move forward. France has already made progress in reducing its GHG emissions. In 2010, France had reached a 6.6 percent reduction in emissions (compared to 1990 levels).[626]

France is committed to meeting the EU target of a 20 percent reduction in emissions by 2020 (1990 levels) and has also set a goal of a 75 percent reduction in emissions by 2050 (1990 levels), with intermediary targets of 40 percent reduction by 2030 and 60 percent reduction by 2040.[627] [628] France estimates that it will exceed its targets and achieve a 22.8 percent reduction in GHG emissions by 2020 (compared to 1990 levels).[629]

L'Observatoire National sur les Effets du Réchauffement Climatique (ONERC — National Observatory on the Effects of Climate Change)

[625] United Nations Development Programme, *Human Development Report 2013: The Rise of the South: Human Progress in a Diverse World*, p. 108.
[626] Embassy of France in Washington, *France - rising to the international climate challenge*.
[627] French Embassy in Ottawa, *Issues and reasons behind the French offer to host the 21st Conference of the Parties on Climate Change 2015*.
[628] France Diplomatie, *Issues and reasons behind the French offer to host the 21st Conference of the Parties on Climate Change 2015*.
[629] Egert, "France's Environmental Policies: Internalising Global and Local Externalities".

The ONERC was created by legislation passed on February 19th 2001.[630] It has three main purposes:

• To collect and spread information on risks related to global warming[631]

• To formulate recommendations on adaptation measures to mitigate the effects of climate change[632]

• To be the focal point of the IPCC in France[633]

Stratégie nationale d'adaptation au changement climatique (SNACC — National Strategy for Climate Change Adaptation)

France's national adaptation strategy was adopted on November 13th 2006, based on recommendations from the ONERC.[634]

It outlines four priority areas for adaptation:

• Acting to ensure public security and health

• Addressing social aspects and inequalities of climate-change risk

• Limiting costs and taking advantage of the change

• Protecting cultural heritage[635]

There are eight strategic action steps developed in the strategy:

• Developing scientific knowledge

• Consolidating observation systems

• Informing and educating all actors

• Promoting a regional and community-oriented approach

• Financing adaptation actions

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630 Climate-Adapt, *ONERC (Observatoire National sur les Effets du Réchauffement Climatique)*.
631 Egert, "France's Environmental Policies: Internalising Global and Local Externalities".
632 Ibid.
633 Climate-Adapt, *ONERC (Observatoire National sur les Effets du Réchauffement Climatique)*.
634 National Observatory on the Effects of Global Warming, *National Strategy for Adaptation to Climate Change*.
635 Ibid.

• Utilizing legislative and regulatory instruments

• Taking into consideration the special status of overseas territories

• Contributing to international cooperation[636]

Grenelle Environment

The Grenelle Environment was a series of political talks initiated by Nicolas Sarkozy in September and October 2007 that brought together representatives of all levels of government, civil society and industry to develop public policy on environmental and sustainable development issues.[637] It has led to the following policies and actions in these areas:

Residential Sector

- After 2012, all new buildings must have average primary energy consumption of less than 50 kWh/*m*2/year.

  This standard was implemented after 2010 for all public buildings and for construction under the National Urban Renovation Program. By 2020, all new buildings must have primary energy consumption that is less than the amount of renewable energy produced in the buildings (energy positive buildings).[638]

- Eco-loans at 0 percent interest allow owners to take 10–15 year loan of up to 30,000 euros towards improving the energy efficiency of their property. This program can be combined with other financial support tools.[639]
- All public and state owned buildings will undergo an energy performance assessment by 2010, and renovations will begin on these buildings in 2012 that should result in a 40 percent reduction in energy consumption and a 50 percent reduction of GHG emissions within a period of 8 years.[640]
- The 800,000 most energy-intensive social housing units will be renovated by 2020. Loans will be made available at a 1.9 percent interest rate between 2009–2010 to allow for the

[636] Ibid.
[637] Vieira and Bétaille, *Grenelle de l'environnement: Is France Making Up for Lost Time?*
[638] Ministry of Ecology, Energy, Sustainable Development and the Sea, *French Climate Plan*.
[639] Ibid.
[640] Ibid.

immediate renovation of 100,000 units, and upgrades will continue at a rate of 70,000 units per year.[641]

Transportation

- 2,000 km of high-speed rail will be built by 2020 and an additional 2,500km will be planned.[642]
- France will meet the EU objective of reducing vehicle emission to 120g CO2/km.[643]
- The "bonus-malus" program in place since January 2008 provides a credit for the purchase of low-emitting vehicles (less than 130g CO2/km) and imposes a tax on purchase of vehicles emitting more than 160g CO2/km.[644]
- France had the objective of a 5.75 percent biofuel mix between 2001–2008, and increased the target to 7 percent in 2010 and 10 percent by 2015. To reach these objectives, a general tax on polluting activities (TGAP) will be imposed on operators not respecting this fuel mix ratio and an exemption program on the domestic tax for petroleum products (TIPP) for biofuels will be implemented.[645]

Industry

- The 2005 directive creating a cap and trade system will be reviewed. This review was adopted by the European Parliament and Council in December 2008. It will allow the implementation period to be extended, to harmonize the system of quota allocation and to reinforce the objectives of reducing greenhouse gas emissions in this sector. At the European level, this measure will achieve a 21 percent reduction of emissions in this sector between 2005–2020 (1990 levels).[646]

Energy

- Certificates of Energy Efficiency, in place since 2006, will be expanded.[647]
- The "Ecoconception" Directive will be implemented.

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641 Ibid.
642 Ibid.
643 Ibid.
644 Ministry of Ecology, Energy, Sustainable Development and the Sea, *French Climate Plan*.
645 Ibid.
646 Ibid.
647 Ibid.

- Completely retiring incandescent light bulbs by 2012[648]
- Limiting the consumption of single digital decoders to 1 W by 2010 and 0.5 W by 2012[649]
- Improving the performance of electric chargers and external power supplies[650]
- Developing renewable energy to achieve 23 percent mix in energy consumption by 2020 by increasing the annual production of renewable energy by 20 million tons of oil equivalent[651]
- Renewable Heat Fund (Fonds chaleur renouvelable): this program created a fund of 1 billion euros for 2009–2011 to develop renewable sources such a wood, geothermal, and solar to be used for heating in the tertiary sector and in industry.[652]
- The tax credit for sustainable development that promotes the purchase of solar water heaters and solar panels was extended until 2012.[653]
- The construction of new biomass plants with a capacity of 250 MW[654]
- Increasing the capacity of geothermal energy sixfold by 2020, by providing 2 million homes with heat pumps[655]
- A fixed tariff for wind energy and improving the planning and consultation process for new wind turbines; simplification of the process for developing off-shore wind energy[656]
- 1 billion euros will be devoted to research into sustainable development.[657]

Solar energy deployment

- Building a solar plant in each French region for a cumulative power of 300 MW, supported by simplified tariffs to secure long term investment.[658]
- Creating a 45 euro cent/kWh tariff to facilitate the installation of solar panels on private buildings[659]
- Reducing the administrative and financial steps when panels do not exceed 30 *m*[660]

[648] Ibid.
[649] Ibid.
[650] Ibid.
[651] Ibid.
[652] Ministry of Ecology, Energy, Sustainable Development and the Sea, *French Climate Plan*.
[653] Ibid.
[654] Ibid.
[655] Ibid.
[656] Ibid.
[657] Ibid.
[658] Ibid.
[659] Ibid.
[660] Ibid.

- Increasing the scope of the public buildings that are eligible for the reduced tariff for purchasing electricity produced from renewable sources[661]
- Construction permits cannot restrict the installation of renewable energy production systems on buildings.[662]

6.6 Actions taken by international bodies

International efforts to address climate change have often been centred around the *United Nations Framework Convention on Climate Change* (*UNFCCC*), though many other international forums and organizations have also made efforts to address the issue. The *UNFCCC* was signed in 1992 and came into force in 1994, after 50 ratifications. The objective of the treaty is to "stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". [663] This has subsequently come to be understood to mean limiting warming to less than 2˚C.

The *Kyoto Protocol* is an international treaty establishing binding obligations on industrialized countries to reduce GHG emissions.[664] The treaty was opened for signature in 1997 and entered into force in 2005 after it was ratified by 55 states accounting for 55 percent of the world's 1990 GHG pollution. Under the protocol, 37 industrial nations as well as the EU are obliged to binding lowered emissions targets for GHG emissions. The protocol includes two commitment periods: the first period applies to emissions between 2008–2012 while the second applies to emissions between 2013–2020. At the December 2012 *UNFCCC* Conference of the Parties, it was agreed that a successor to the *Kyoto Protocol* would be established by 2015. Canada has repeatedly endorsed the 2˚C limit for warming, including by signing the 2009 *Copenhagen Accord* which recognizes "the scientific view that the increase in global temperature should be below 2 degrees Celsius".[665]

World Health Organization

[661] Ibid.
[662] Ibid.
[663] Parties to the United Nations Framework Convention on Climate Change, *United Nations Framework Convention on Climate Change*, Artice 2:"Objective".
[664] Parties to the Kyoto Protocol to the United Nations Framework Convention on Climate Change, *Kyoto Protocol to the United Nations Framework Convention on Climate Change*.
[665] The Heads of State, Heads of Government, Ministers, and other heads of delegation present at the United Nations Climate Change Conference 2009 in Copenhagen, *Copenhagen Accord*, Article 1.

On World Health Day in 2008, the World Health Organization (WHO) chose to highlight the effects of climate change on human health in recognition of the increasing risk that climate change poses to global public health security.[666] In collaboration with the German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety, the European regional office of the WHO has launched a broad-scale initiative to protect health from climate change across seven countries including Albania, Kazakhstan, Kyrgyzstan, the Russian Federation, Tajikistan, the former Yugoslav Republic of Macedonia and Uzbekistan.[667] The initiative includes action on climate adaptation and strengthening health infrastructure.

In 2010, the WHO and United Nations Development Programme (UNDP) launched *Climate Change Adaptation to Protect Human Health*, the first ever global public health project focusing on adaptation to climate change. The program aims "to increase adaptive capacity of national health system institutions, including field practitioners, to respond to climate-sensitive health risks" and is led by the ministries of health in seven national partners including China, Jordan, and Kenya.[668]

G8

The G8 has repeatedly pledged to take action on climate change. The group first acknowledged it at the 1989 Paris Summit, and commitments to reduce emissions have been regular features of G8 declarations since then.[669] At the 2005 Gleneagles summit, all G8 members affirmed the importance of "tackling climate change, promoting clean energy and achieving sustainable development globally". At the 2008 summit in Hokkaido and Tokyo, G8 members pledged to reduce global emissions by 50 percent by 2050, expanded to "80% or more... for developing countries by 2050" at the 2009 summit in L'Aquila.[670] The joint declaration from the 2010 Muskoka summit recognized "the scientific view that the increase in global temperature should not exceed 2 degrees Celsius".[671]

The Arctic Council

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666 World Health Organization, *World Health Day 2008: protecting health from climate change*.
667 World Health Organization, *Protecting health from climate change: a seven-country initiative in the eastern part of the WHO European Region*.
668 World Health Organization, *Climate Change Adaptation to Protect Human Health*.
669 Clarke et al., *2010 Muskoka G8 Summit Final Compliance Report*, p. 127.
670 Ibid., p.128.
671 Ibid., p.151.

As Chair of the Arctic Council, Swedish Minister of Foreign Affairs Carl Bildt stated:

The fight against climate change is an imperative common challenge for the international community and requires immediate global measure... We therefore urge all countries to take decisive action, recognizing that deep cuts in global GHG emissions are required according to science with a view to reducing global GHG emissions so as to hold the increase in global average temperature below 2°C above pre-industrial levels.[672] The statement was made to the *UNFCCC* and supported by all eight member states of the Arctic Council, including Canada and the United States.

Commonwealth of Nations

The Commonwealth Forum of National Human Rights Institutions (CFNHRI) officially recognizes the threat of climate change impacts on human rights, and affirms the need for vulnerable populations to have a voice in international discussions around policy and plans to address consequences of climate change such as human displacement, desertification, and rising sea levels.[673]

In 2007, the Commonwealth approved the Lake Victoria Climate Change Action Plan.[674] The document notes that: "climate change is a direct threat to the very survival of some Commonwealth countries, notably small island states".

The Council of Europe

Founded in 1949, the Council of Europe is an international organization with 47 member states, devoted to promoting cooperation in areas including human rights. In 2009, the Parliamentary Assembly adopted Recommendation 1879 which calls on member states to promote renewable energy, improve the efficiency of fossil fuel use, and promote research.[675] In January 2011, the Committee on the Environment, Agriculture, and Local and Regional Affairs issued a declaration calling for global temperature to be "held to a rise of no more than 2˚C from pre-industrial levels" and arguing that "[a] failure to act would consign the poorest 40 per cent of the

[672] Bildt, *Statement to the UNFCCC COP XVII*.
[673] Commonwealth Forum of National Human Rights Institutions, *The Human Rights Impact of Climate Change*.
[674] Commonwealth of Nations, *Lake Victoria Commonwealth Climate Change Action Plan 2007*.
[675] Council of Europe Parliamentary Assembly, *Recommendation 1879: Renewable energies and the environment*.

world's population — 2.6 billion people — to a dismal future, jeopardising their right to life and access to water, food, good health, decent housing and security".[676]

Indian Ocean Commission (IOC)

Created in 1982, the IOC is composed of five countries in the Indian Ocean. Since 2008, they have officially acknowledged climate change as a major challenge for Small Island Developing States (SIDS), and recognizes climate change adaptation as an integral component of IOC's actions. Their ACCLIMATE project focuses on growing sustainable agriculture, mitigating natural risks, and building capacity for SIDS to protect themselves from the threats posed by changes in weather.[677]

U.N. Educational, Scientific and Cultural Organization (UNESCO) World Heritage Committee

The UNESCO *Convention concerning the Protection of the World Cultural and Natural Heritage* was adopted by the organization's general conference in 1972 and came into force in 1975.[678] Under the treaty, both individual states and the international community as a whole are obligated to cooperate to protect both cultural heritage (monuments, buildings, and sites) and natural heritage. In 2006, the World Heritage Committee recognized the threat posed by climate change to sites including the Sagarmatha National Park (Nepal), Huascaran National Park (Peru), the Great Barrier Reef (Australia) and the Belize Barrier Reef Reserve System (Belize).[679] The committee strongly encouraged state parties to "highlight the threats posed by climate change to natural and cultural heritage, start identifying the properties under most serious threats, and also use the network to demonstrate management actions that need to be taken to meet such threats".

U.N. High Commissioner for Human Rights

The website of the U.N. Office of the High Commissioner for Human Rights (OHCHR) explains that: "[i]t is becoming apparent that climate change will have implications for the

[676] Council of Europe Committee on the Environment, Agriculture, and Local and Regional Affairs, *As the world's warmest year ends, time for climate change to be seen as a human rights issue*.
[677] Indian Ocean Commission, *ACCLIMATE: Adaptation au changement climatique*.

[678] The General Conference of the United Nations Educational, Scientific and Cultural Organization, *Convention Concerning the Protection of the World Cultural and Natural Heritage*.
[679] United Nations Educational, Scientific and Cultural Organization World Heritage Committee, *Threats to World Heritage Properties*.

enjoyment of human rights".[680] The OHCHR has repeatedly recognized the threat to basic human rights posed by the varied consequences of climate change, including through five resolutions passed by the United Nation Human Rights Council during the past five years. These include Resolution 7/23, adopted March 28th 2008, in which the council expressed concern that climate change "poses an immediate and far-reaching threat to people and communities around the world".[681] The resolution also called upon the OHCHR to produce a study on the relationship between climate change and human rights, which was published in 2009. The report concluded that: "An increase in global average temperatures of approximately 2˚C will have major, and predominantly negative, effects on ecosystems across the globe, on the goods and services they provide".[682]

On March 25th 2009, the Human Rights Council adopted Resolution 10/4, noting that:

> Climate change-related impacts have a range of implications, both direct and indirect, for the effective enjoyment of human rights including, inter alia, the right to life, the right to adequate food, the right to the highest attainable standard of health, the right to adequate housing, the right to self-determination and human rights obligations related to access to safe drinking water and sanitation, and recalling that in no case may a people be deprived of its own means of subsistence.[683]

And that:

> The effects of climate change will be felt most acutely by those segments of the population who are already in vulnerable situations owing to factors such as geography, poverty, gender, age, indigenous or minority status and disability.[684]

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680 United Nations Office of the High Commissioner for Human Rights, *Human rights and climate change*.
681 United Nations Human Rights Council, *Resolution 7/23: Human rights and climate change*.
682 United Nations Office of the High Commissioner for Human Rights, *Report of the Office of the United Nations High Commissioner for Human Rights on the relationship between climate change and human rights*, p. 7.
683 United Nations Human Rights Council, *Resolution 10/4: Human rights and climate change*.
684 Ibid.

This was followed by further resolutions on March 24th 2011 and in September 2011.[685] [686]

On March 30th 2012, U.N. High Commissioner for Human Rights Navi Pillay released an open letter to all Permanent Missions in New York and in Geneva that underscores the responsibilities on behalf of all states to ensure "full coherence between efforts to advance the green economy, on the one hand, and their human rights obligations on the other".[687] Pillay also argues that:

> [S]trategies based on the narrow pursuit of economic growth without due regard for equity and related environmental, social, and human rights considerations will both fail in their economic objectives, and risk damaging the planet, and the fundamental rights of the people who live here. Incoherence between international human rights standards, environmental strategies, and economic policies can undercut all three. The logic of integration... is unavoidable. Without explicit human rights safeguards, policies intended to advance environmental or development goals can have serious negative impacts on those rights.[688]

The World Bank

In 2012, the World Bank lent $7.1 billion for climate change mitigation measures, along with $4.6 billion for adaptation.[689] In July 2013, the World Bank announced that it will be amending its lending policy to restrict financial support for coal-fired power plants, except in exceptional circumstances where "no feasible alternatives" exist.[690] [691]

World Bank President Jim Yong Kim has tied this new policy direction explicitly to the risks posed by climate change, including food shortages, droughts, floods, sea level rise, and water scarcity.[692]

[685] United Nations Human Rights Council, *Human rights and the environment*.
[686] United Nations Human Rights Council, *Human rights and climate change*.
[687] Pillay, *Open Letter To all Permanent Missions in New York and Geneva*, p. 2.
[688] Ibid., p. 2.
[689] The World Bank, *Climate Change Projects & Programs*.
[690] The World Bank, *World Bank Group Sets Direction for Energy Sector Investments*.
[691] See also: Yukhananov and Volcovici, *World Bank to limit financing of coal-fired plants*.
[692] Kim, *Ending Poverty Includes Tackling Climate Change*.

In August 2013, the World Bank launched a US$550 million green bond initiative, "designed to address the challenges of climate change in the developing world".[693]

African Development Bank

The President of the African Development Bank has stated that: "Climate change is central to the core business of the African Development Bank and requires urgent action".[694] In 2009, the Bank Group developed its Strategy of Climate Risk Management and Adaptation (CRMA), which calls for growth and support in capacity building for African countries to confront the challenges of climate change. It lays down guidelines for loans and investment that ensure all projects are "climate proof", which means that they are "designed, installed, implemented and managed to reduce to a minimal level the adverse effects of climate change, with the most cost-effective ratio as possible".[695] This strategy calls for increased support for capacity building of African countries to tackle climate change risks. It also declares that all investments financed by the bank should work toward "enhancing climate resilience and climateproofing of economic and social infrastructure".[696] The CRMA outlines strategies to decrease the vulnerability of African nations to climate change and build sustainable energy infrastructure, and includes investments of almost US$8 billion by 2015.

6.7 These actions are not adequate to avoid dangerous climate change

Despite the growing willingness of governments at all levels to strengthen climate change policies, the world's emissions are not on a trajectory that is compatible with keeping warming to less than 2˚C.[697] [698] [699] Humanity is now adding over 35 gigatonnes (billions of tonnes) of CO2 to the atmosphere each year, and the global quantity of that pollution is rising by 3 percent per year.[700] That means that we are on track to exceed the 565 gigatonne limit for keeping warming under 2˚C within 15 years.

[693] The World Bank, *World Bank Launches USD 550 million Green Bonds*.
[694] African Development Bank Group, *Climate Change*.
[695] African Development Bank Group, *Climate Risk Management and Adaptation*.
[696] Ibid., p.11.
[697] See: Peters et al., "The challenge to keep global warming below 2˚C".
[698] ScienceDaily, *Reaching 2009 International Climate Change Goals Will Require Aggressive Measures*.
[699] Stocker, "The Closing Door of Climate Targets", p. 280–2.
[700] Intergovernmental Panel on Climate Change, *Climate Change 2007: Synthesis Report*, p. 26.

In order to stabilize warming at any level, the total quantity of GHGs in the atmosphere must be stabilized. For this to be accomplished, deep global emission cuts are required — far beyond those that will result from policies announced and implemented to date. As a consequence, it is necessary for additional action to be taken, including the redirection of investment away from new fossil fuel projects and toward cost-effective pollution mitigation options, including conservation and renewable energy.

7 | Short answers to common questions

7.1 Why should the university 'take sides' in this matter? Is it appropriate for the university to take stances on social and political issues?

The University of Glasgow's Policy on Socially Responsible Investment states the university's commitment to socially responsible investment. The policy states that specific cases of investment will be judged based on their compliance with the university's value systems "as reflected in the Mission Statement or the Strategic Plan or in regard to wider issues of social, environmental and humanitarian concern".[701] As previously explained, fossil fuel companies are not socially responsible.[702] Investing in these companies goes against the university's core values.

- Integrity: "Our integrity means that we're committed to truth, fairness and respect."
    - By continuing to invest in the fossil fuel industry, the university is ignoring the truth of climate crisis and of its immediacy. Investment in the fossil fuel industry does not comply with the principles of fairness and respect, for the benefits from burning fossil fuels accrue to those who use them directly — groups that are disproportionately influential politically and legally. By contrast, the harms from burning these fuels are imposed on everybody, including those who have made little use of them historically and defenceless members of future generations. If future generations are to be trated fairly and with respect, they cannot inherit a planet that has been impoverished by uncontrolled climate change. Similarly, the principles of fairness and respect forbid us from ignoring what we know about the harms of GHG pollution by continuing to impose risk and suffering on innocent people around the world today.
- Credibility: "Our credibility is built on innovation, on academic rigour, and on the way we work together to find creative solutions to the problems facing mankind today."
    - Continuing to invest in fossil fuel industry questions the importance of innovations and research in the university. Divestment is about finding solutions to the problems of mankind today; investment in fossil fuel industry means denying the problem and our responsibility.

[701] University of Glasgow, *Policy on Socially Responsible Investment.*
[702] See: 3. *The activities of fossil fuel companies are socially injurious, and this social injury cannot be reasonably remedied through shareholder voice*.

- Success: “Every day we’re making progress, every day we’re achieving more, and we’ll support you to do the same.”[703]
    - Investing in fossil fuel industry means that the university is denying the current crisis we face. Committing to divestment is a chance for the university to show its will and capability to embrace change and progress. The University of Glasgow has an opportunity to be the leader of divestment among universities in the UK.

Furthermore, the university has already taken several actions that acknowledge the seriousness of climate change and the appropriateness of changing university practices in order to make it less severe.[704] Investing in fossil fuel companies is in contradiction with these commitments.

The Policy on Socially Resposible Investment specifically mentions the university’s refusal to invest in the tobacco industry since ”such an investment runs entirely counter to the university’s direct interest in research”. [705] As demonstrated in 3.6 *Why fossil fuels are like tobacco*, the case for divestment here is similar to the case on tobacco.[706]

Though the main argument of this case for divestment is the social and moral responsibility of the university, there is also a financial argument against investing in the fossil fuel industry. Divestment would allow the university to control the risk of being exposed to fossil fuel stocks which may lose value as governments adopt more stringent climate policies. A report prepared for the Greens/EFA Group by Weyzig et al. investigates the financial threat of the carbon bubble which refers to the overvaluation of fossil fuel reserves and related assets.[707] It states that “[e]quity, bond and credit exposures of EU financial institutions to firms holding fossil fuel reserves and to fossil fuel commodities are substantial”, exceeding €1 trillion. [708]

Fossil fuel divestment is also justified because governments have been ineffective in combatting climate change. The *United Nations Framework Convention on Climate Change* came into force in 1994, and there have already been 20 Conferences of the Parties. The *Kyoto Protocol* came into force in 2005. Despite all this diplomacy and effort, GHG pollution continues to increase, and the amount of CO_2 in the atmosphere continues to grow to ever-more dangerous levels. Organizations including universities and other institutional investors can play an important role in redirecting investment away from making the problem worse and toward solving it. They can also help push governments to act more efficaciously and with greater speed.

In 1972, Yale University published *The Ethical Investor: Universities and Corporate Responsibility*. The book describes a “moral minimum” obligation. It is not possible for universities

[703] University of Glasgow, *Our Values.*
[704] See: 2.3 *The University of Glasgow is already taking action on climate change*.
[705] University of Glasgow, *Policy on Socially Responsible Investment.*
[706] See: 3.6 *Why fossil fuels are like tobacco.*
[707] Weyzig, Kuepper, van Gelder and van Tilburg, *The Price of Doing Too Little Too Late*.
[708] Weyzig, Kuepper, van Gelder and van Tilburg, *The Price of Doing Too Little Too Late*, p.5.

to take action in response to every social wrong, but they should work to "avoid and correct selfcaused social injury".[709] Given the robustness of our current scientific understanding of climate change, investing in the further development and exploitation of fossil fuel resources falls into this category of behaviours.[710]

7.2 Isn't shareholder activism a better option?

As with the tobacco industry, the problem with the fossil fuel industry is the product itself. It is not plausible that the University of Glasgow could attend a shareholder meeting of Peabody Energy and convince them to stop digging up and burning coal. Likewise, shareholder activism cannot persuade Shell to stop producing oil and gas.[711]

Partly because of the political influence of these corporations — and the effectiveness of their campaign to delay government action — climate change has become an urgent problem. The decisions made in the next few decades will do a great deal to determine what sort of energy infrastructure will be dominant for the century ahead. That, in turn, will do much to determine how severe climate change will become. By taking decisive and well-justified action now, the university can help respond to this urgent problem.

7.3 Other people will buy the stocks we sell, so how does this make a difference?

Divestment has proven to be a successful strategy in the past, notably in the cases of tobacco and South African apartheid. Divestment campaigns have undermined damaging companies' social license to operate. They have also signalled that important institutions with access to large amounts of expert advice have considered the questions involved seriously and decided that it is appropriate to act. Universities are respected institutions with the power to help shape public opinion and perceptions about the future. The fossil fuel industry is already aware of this. In a May 2013 presentation given by Meredith Xcelerated Marketing to the American Coal Council, divestment campaigns were described as "a potent form of publicity".[712]

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[709] Simon, Powers, and Gunnemann, *The Ethical Investor: Universities and Corporate Responsibility*, p. 21.

[710] *The Ethical Investor* also describes the Key Gardens Principles of need, proximity, capability, and last resort. They require a social harm which calls for redress, proximity in the sense of having an understood effect, having an opportunity to act, and last resort. In discussing 'last resort', the book explains that: "the guilt of all becomes the guilt of no one. This result is unacceptable. We may not be able to avoid the world's guilt, but we can seek to reduce the level of injury" (p. 26). The book also explains: "if the university is able, by non self-sacrificial means, to mitigate injury caused by a company of which it is an owner, it would not seem unreasonable to ask it to do so" (p. 24)

[711] See also: "Can shareholders pressure fossil fuel companies without divesting?" at: http://gofossilfree.org/faq

[712] Sheppard, *The Coal Industry Knows That Enviros Are Winning*.

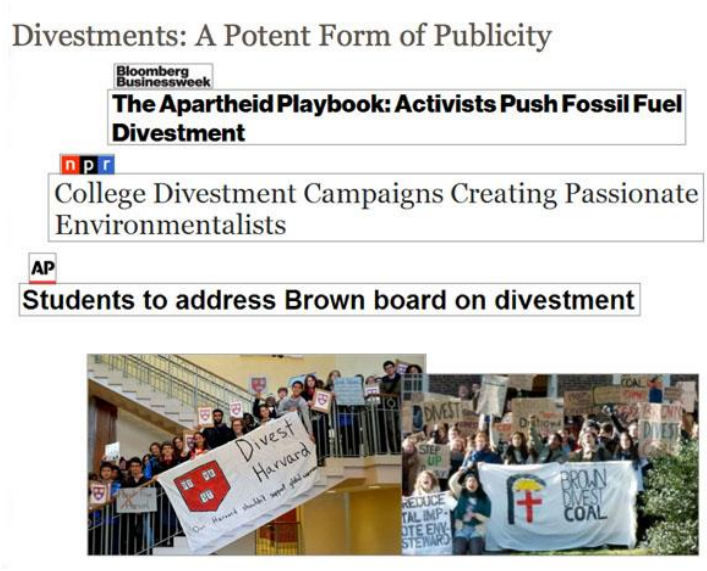

Figure 11: One slide from the slideshow on threats to the coal industry. Source: Meredith Xcelerated Marketing

Divestment would signal that the 'smart money' is shifting away from fossil fuels. This could help produce a political climate in which significant action can be taken, including in the form of carbon pricing and reduced subsidies for fossil fuels.[713]

7.4 What are the University of Glasgow's peer schools doing?

Fossil fuel divestment campaigns are active in more than 40 universities in the UK.

- 13 Russell Group universities: University of Birmingham, University of Cambridge, Cardiff University, University of Edinburgh, King's College London, University of Leeds, Imperial College London, London School of Economics, University of Manchester, University of Oxford, University of Sheffield, University of Exeter, University of Warwick
- Other universities include: University of St Andrews, Sheffield Hallam, University of Hull, UCL, Newman University, Bath Spa University, University of Essex, University of Southampton, SOAS, University of Gloucerstershire, University of Winchester, Longborough University, Robert Gordon University, Lancaster University, Swansea University, Leeds Metropolitan Univeristy, University of East London, University of Dundee, University of Surrey, University of the West of England, University of Aberdeen, University of Reading, University of East Anglia
- In January 2014, the University of Edinburgh published a thorough consultation paper on its intentions to become a responsible investor, including the option of divestment.[714] On the 14th of February, the Edinburgh University People & Planet Society handed in a petition of

[713] See also: "Companies like ExxonMobil, Shell, BP have billions of dollars/euros. How can divesting the funds from a few institutions likeuniversities, pensions and churches make an impact?" at: *http://gofossilfree.org/faq/*
[714] People & Planet. *Will Edinburgh be first?*

1390 signatures, asking the university to divest from fossil fuel companies and the arms trade.[715]

- In the university of Warwick, the motion to support the divestment campaign was debated and voted on in the All Student Meeting on the 3rd of February. Out of the 1298 students who voted, 65% voted to support the campaign, whilst 10% abstained and 25% voted against.[716]
- The Student's Union in the University of Hull gave its support to the divestment campaign. The motion was put forward by The Hull Green Society and was passed with 68% in favour and only 3% voting against.[717]
- Student Union motions have also been passed at Oxford, Cambridge, UCL, Birmingham, UEA, Glasgow, Edinburgh, SOAS, Anglia Ruskin and KCL Student Unions.

These universities are joining a global movement of over 400 campaigns that has been described as "the most far-reaching threat to the global fossil fuel industry" by Oxford academics.[718] In North America, where the campaign started, divestment campaigns are active at more than 300 schools and so far nine schools have committed to divestment.[719]

No UK university has yet committed to divest from fossil fuels. This gives University of Glasgow an opportunity to distinguish itself and show leadership. As the severity of climate change worsens, the case for divestment will strengthen; at the same time, as governments become more active it will become increasingly clear that fossil fuel stocks are overvalued. By moving early, University of Glasgow can contain this risk and gain reputational advantages.

7.5 What are other large investors doing?

In October, Boxter, Netherlands became the first town in Europe to divest from the fossil fuel industry.[720] In the United States, over 20 cities have already committed to divestment, including Seattle, San Francisco and Berkeley.[721]

Operation Noah is campaigning for UK churches to divest. In October 2013, Quakers in Britain decided to disinvest since "investing in companies which are engaged in fossil fuel extraction is incompatible with their commitment made in 2011 to become a sustainable low-carbon community".[722] The Church of England is currently considering divestment.[723] In the United States,

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715 People & Planet. *Edinburgh Students hand in 1400.*
716 People & Planet. *65% of Warwick Students support fossil fuel divestment.*
717 People & Planet. 68% Hull students vote to support Fossil Free.
718 People & Planet. *Achievements: a brief history of People & Planet.*
719 Go Fossil Free. *Commitments.*
720 Philips, *Netherlands town becomes first in Europe to vow fossil fuel divestment.*
721 See full list: http://gofossilfree.org/commitments/
722 Quakers in Britain. *Quakers to disinvest from fossil fuels.*
723 Bright Now. *General synod debated the climate – and the climate won.*

eleven regional conferences of the United Church of Christ in the United States have voted to divest.[724] Numerous other churches and faith-based organizations are considering divestment, including the First Unitarian Church of Salt Lake City, the Evangelical Lutheran Church of Oregon, and the Uniting Church of New South Wales & ACT, Australia.

Hedge fund billionaire Tom Steyer has decided to divest his holdings in fossil fuel companies. He argues that a portfolio that excludes fossil fuels "will outperform the market".[725] In July 2013, the Norwegian financial services company Storebrand ASA announced that they will be divesting from 19 fossil fuel companies.[726] The decision was motivated by the belief that the value of these companies would fall because of their negative climate change impacts.[727][728] The Dutch bank Rabobank has also decided not to fund shale gas development.[729] According to a spokesperson from the bank, this is because "[t]he bank's global policy is not to be involved with extracting fossil fuels where it is not clear what the risks and consequences may be".[730]

In July 2013, European Union Climate Commissioner Connie Hedegaard called for the European Investment Bank (EIB), the European Bank for Reconstruction and Development (EBRD), and the World Bank to eliminate public support for fossil fuels.[731] [732] Each year, these three institutions provide US$168 billion in funding for projects around the world.[733]

7.6 But don't fossil fuel companies also invest in renewable energy?

In 2008, British Petroleum (BP) launched a rebranding effort in which it claimed that its initials now meant 'Beyond Petroleum'.[734] This is now widely seen as an example of 'greenwashing' — devoting extensive resources to advertising how environmentally-friendly an organization claims to be, while not actually adopting sustainable practices.[735] BP has since abandoned its foray into solar power generation and put its U.S. wind-farm business up for sale.[736][737] This behaviour is typical of the fossil fuel industry, which has spent vast sums of money touting its environmental credentials, while its business plans — which depend on burning all of their fossil fuel reserves — are fundamentally at odds with environmental sustainability. As BP's

[724] Wangsness, *More Churches calling for divestment from fossil fuel.*
[725] Steyer, To the Middlebury College Board of Trustees.
[726] Storebrand ASA, *Storebrand reduserer CO_2-eksponeringen i sine investeringer — 19 selskaper ekskluderes.*
[727] Blackburne, *Norwegian pension fund divests from 'financially worthless' fossil fuel firms.*
[728] See also: Grandia, *Major Norwegian Pension Fund Drops Tar Sands Investments.*
[729] Bertini, *Dutch bank refuses loans to businesses involved in shale gas*.
[730] DutchNews.nl, *Rabobank will not finance shale gas extraction.*
[731] The CEE Bankwatch Network, SEE Change Net, and the WWF, *Invest in Haste, Repent at Leisure,* p. 9–10.
[732] See also: EurActiv.com, *Hedegaard urges development banks to divest from fossil fuels.*
[733] The CEE Bankwatch Network, SEE Change Net, and the WWF, *Invest in Haste, Repent at Leisure*, p. 10.
[734] Pearce, Greenwash: BP and the myth of a world 'Beyond Petroleum'.
[735] The Oxford English Dictionary defines the term as: "The creation or propagation of an unfounded or misleading environmentalist image"
[736] Winkley, Energy Journal: *BP No Longer Beyond Petroleum.*
[737] David, *'Beyond Petroleum' No More? BP Goes Back to Basics.*

chief executive, John Browne spent $200 million advertising the 'Beyond Petroleum' slogan. Under his tenure, BP was "marred by a succession of devastating accidents... [including] an explosion at BP's Texas City refinery in 2005 that killed 15 workers and injured 170 others, and an oil spill a year later that dumped 4,800 barrels of oil at Prudhoe Bay, on the coast of Alaska".[738] In April 2010, BP's Deepwater Horizon oil platform in the Gulf of Mexico exploded, causing over $40 billion in damage, alongside massive ecological harm.[739] All told, BP may end up paying over US$90 billion in fines and compensation for causing the disaster.[740] At the peak, BP was directing 6 percent of overall investment toward renewables. This compares with 2.5 percent at Chevron and Shell, with no other major oil company investing more than 1 percent.[741]

The sums fossil fuel companies are investing in renewable energy are dwarfed by the investments they are making in unconventional sources of coal, oil, and gas. For example, BP has announced its intention to increase spending on arctic drilling by $1 billion over five years, increasing its fleet of oil rigs from seven to nine by 2016.[742] In 2003, BP invested $6.75 billion in Russia's Tyumen Oil Company, which is involved with the massive Sakhalin offshore project.[743] The 200 fossil fuel companies with the largest reserves spent $674 billion in 2012 identifying and developing new fossil fuel reserves, as well as researching ways to extract fossil fuels from proven reserves.[744, 745]

Conventional fossil fuel sources are more than sufficiently abundant to allow humanity to far exceed the 2˚C 'safe limit' for climate change. The costly pursuit of exotic new reserves shows how fossil fuel companies have failed to internalize the reality of climate change and are continuing to implement investment plans that are sharply at odds with planetary safety. Also, based on various credible estimates of the social cost of carbon, the total damage being done to society by fossil fuel burning substantially exceeds the scale of the investments the industry is making in renewables.[746]

7.7 In what cases have courts found that fossil fuel companies caused injury?

So far, there are a limited number of legal precedents in which the seriousness of climate change and the injury being caused by fossil fuel companies are recognized. For instance, in 2008 jurors decided that damage caused to the Kingsnorth power station in Kent by protesting climate change activists was justifiable in light of the amount of environmental damage being done by the

[738] The Economist, *In the black stuff*.
[739] McCarthy, *Canada raises liability for offshore oil spills to $1-billion.*
[740] The Economist, *Supermajordammerung*, p. 20.
[741] Juhasz, *Big Oil's Big Lies About Alternative Energy.*
[742] The Wall Street Journal, *BP Plans $1 Billion in New Spending on Alaska.*
[743] The Economist, *Not beyond petroleum.*
[744] Carbon Tracker Initiative, *Unburnable Carbon: Are the world's financial markets carrying a carbon bubble?,* p. 4.
[745] See also: Steiner, *Decarbonising the economy: the pivotal role of the financial sector.*
[746] See: Pricing the social cost of carbon, p.27.

power plant.[747] In past instances, the University of Glasgow has accepted the appropriateness of divestment before a comprehensive legal justification has been in place. For more information, see: Why fossil fuels are like tobacco.

7.8 Isn't the energy sector, including oil and gas extraction, production and distribution, highly regulated by government at all levels?

When it comes to GHG pollution, the fossil fuel industry is essentially unregulated by the UK government. Firms are free to use the atmosphere as a dumping ground for CO_2 pollution.[748] [749] The harm the industry is causing is largely dispersed, which makes it hard to assign responsibility, but we know there are major damaging impacts in the aggregate. Furthermore, the UK government has adopted policies intended to accelerate the growth of the fossil fuel sector. The UK Chancellor, George Osbourne, has voiced his support of the fossil fuel industry's continued extraction of oil off the coast of Scotland, expressing his hopes that, "We'll still be recovering oil from the North Sea and West of Shetland in the 2050s."[750] He has also put in place a £3 billion allowance to support investment in and exploration of large and deep fields like those West of Shetland.[751] In addition, the UK government has set a "generous" new tax regime for shale gas and removed the bureaucratic obstacles to its use onshore and offshore.[752] The 2008 Climate Change Act established the world's first legally binding climate change target. The UK government has committed to reducing the UK's GHG emissions by at least 80 percent (from the 1990 baseline) by 2050.[753] These targets have, however, been criticized as being too weak to avoid dangerous climate change.[754] Furthermore, the UK government has not been meeting with its commitment to reduce national greenhouse gas emissions, and is on track to miss its targets from 2017 to 2027.[755] The regulation that exists in the United Kingdom is not putting the country on a pathway toward making a fair contribution in the global climate change mitigation effort. Additional regulation is required and — until it is in place — socially conscious organizations should take action themselves in response to the harm being caused by fossil fuels.

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[747] McCarthy, *Jury Decides That Threat of Global Warming Justifies Breaking The Law.*
[748] See: Paris, *Oil and gas industry emission rules still not ready from Ottawa.*
[749] See also: Stewart, *On Keystone XL, beware John Baird bearing gifts*.
[750] Government of the UK, *Speech by the Chancellor of the Exchequer, RT Hon George Osborne MP, Offshore Europe Conference.*
[751] Government of the UK, *Speech by the Chancellor of the Exchequer, RT Hon George Osborne MP, Offshore Europe Conference.*
[752] Ibid.
[753] Government of the UK, *Reducing the UK's greenhouse gas emissions by 80% by 2050.*
[754] Gray, *UK climate targets not 'tough enough'.*
[755] Harvey, *UK 'could miss carbon emissions targets in 2020'*.

7.9 Can humanity manage without fossil fuels?

This question was extensively examined by Cambridge physicist David MacKay, resulting in his 2009 book *Sustainable Energy – without the hot air*, which is available for free online.[756] In his detailed analysis, MacKay considers both the scope for reducing energy demand through energy efficiency and the opportunities for producing energy from low and zero-carbon sources like renewables and nuclear power. In order to demonstrate the feasibility of providing everyone in the world with enough energy to sustain a high standard of living, MacKay calculates that "[t]o supply every person in the world with an average European's power consumption (125 kWh/d [kilowatt-hours per day]), the area required would be two 1000 km by 1000 km squares in the desert".[757] Although doing this with only giant solar facilities would be impractical and probably prohibitively expensive, the example nonetheless demonstrates that humanity can enjoy an improved standard of living without relying on fossil fuels at all. MacKay concludes that by combining wind, hydro, tidal, wave, geothermal, solar, and nuclear power it is possible for everyone in the world to consume 80 kWh per day — equivalent to the total per capita energy use in Hong Kong today.[758]

The opportunities associated with renewable energy deployment are already being realized, and major growth potential remains. The U.S. Department of Energy believes that by 2030, 20 percent of American electricity could come from wind, reducing annual electric sector CO_2 emissions by 825 million metric tons.[759] Iowa already generates 39 percent of its energy from this low-carbon source.[760] Concerns about the intermittency of wind energy have also proven exaggerated; by balancing production from wind facilities in different areas, consistent power output can be created.[761]

Huge opportunities exist to reduce energy use by improving efficiency, including in industry, transport, power generation, and buildings. According to the IEA, these possibilities have not yet been factored into government planning: "[t]wo-thirds of the economic potential to improve energy efficiency remains untapped in the period to 2035" and energy efficiency remains "a huge opportunity going unrealised".[762] The IEA explains that "[e]conomically viable efficiency measures can halve energy demand growth to 2035" and produce reductions in oil use equivalent to the production from Russia and Norway.[763] By 2035, the IEA predicts that improved energy efficiency

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[756] MacKay, *Sustainable Energy – without the hot air*.
[757] MacKay, *Sustainable Energy – without the hot air*, p. 178.
[758] Ibid., p. 106, 238.
[759] United States Department of Energy, *20% Wind Energy by 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply.*
[760] The Economist, *Blown away*.
[761] Ibid.
[762] International Energy Agency, *World Energy Outlook 2012: Presentation to the press*, p. 13.
[763] Ibid., p. 14

could cut energy expenditures by 20 percent, alongside "wider economic gains, particularly for India, China, the United States and Europe".[764]

The transition to renewable energy will bring jobs and other economic benefits. Analysis from the Union of Concerned Scientists found that a national standard of 25 percent renewable energy in the United States by 2025 would "create more 'green' jobs, lower consumer energy bills in every region of the country, and reduce carbon dioxide (CO_2) and other harmful emissions from power plants—the biggest source of global warming pollution in the United States".[765] The report finds that this policy would create three times as many jobs as producing the same amount of energy from fossil fuels.[766] A zero-carbon energy system would also reduce volatility in energy prices, since the inputs are free once the infrastructure is built, and would eliminate the security and economic risks experienced by states dependent on fossil fuel imports.

On a business-as-usual pathway in which humanity burns most or all of the planet's remaining fossil fuels, the planet can be expected to experience catastrophic changes that will wreak considerable economic damage. As such, the choice we are facing is not between perpetuating the *status quo* indefinitely or committing to decarbonization. Rather, our choice is between decarbonization and catastrophic climate change. The World Bank has argued that "[t]he current level of action puts us on a pathway towards a 3.5–4°C warmer world by the end of this century" and that "[s]uch a scenario would have a devastating impact on the climate and would threaten our current economic model with unprecedented and unpredictable impacts on human life and ecosystems in the long term".[767] [768] As the Australian government's Climate Commission explains: "Burning all fossil fuel reserves would lead to unprecedented changes in climate so severe that they will challenge the existence of our society as we know it today."[769] Whether we like it or not, humanity must learn how to manage without fossil fuels.

7.10 Won't divestment hurt the endowment, including University of Glasgow's ability to provide scholarships?

As discussed at greater length in 5.2 *There is no evidence of a divestment penalty for investors*, there is evidence that portfolios that exclude companies that cause social injury do not suffer a financial penalty for doing so. Deutsche Bank and Mercer have conducted major meta-studies on portfolios that consider environmental, social and governance (ESG) factors and found that there is either a neutral or positive relationships between financial performance and the

[764] Ibid., p. 15
[765] Union of Concerned Scientists, *Clean Energy, Green Jobs*.
[766] See also: Union of Concerned Scientists, *Benefits of Renewable Energy Use*.
[767] The World Bank, *Mapping carbon pricing initiatives: developments and prospects*, p. 13.
[768] See also: Schuetze, *Environmental Woes Could Reverse Global Development*.
[769] Government of Australia Climate Commission, *The Critical Decade 2013*, p. 5.

incorporation of ESG factors into portfolio management.[770] [771] Hedge fund billionaire Tom Steyer explains in a letter to the Corporation of Brown University:

> The available research, looking backward, shows that the return penalty would be tiny—but in any event good investors rarely look backward. Looking to the future, the data on climate change makes it clear that something has changed, and as the rest of the world realizes this, coal stocks will come under increasing pressure. At the moment, other investors have not fully realized the risk that carbon reserves will become a stranded asset; if you acknowledge what your own science departments are telling you this gives you an edge relative to those investors. I can tell you that in my own investments, I have directed my financial team to divest my holdings of coal investments so that I will have a coal free portfolio myself – in part because I am convinced it will outperform the market.[772] [773]

Unlike fossil fuel divestment, failing to deal with the 'carbon bubble' could harm the university's financial standing in the long term. Universities are entities that expect to exist forever and which therefore have very long time horizons for their investment decisions. In the long term, the university's ability to fund research and provide scholarships depends on general financial health, which would be improved by divestment.

7.11 Won't fossil fuel companies stop making donations to University of Glasgow?

We did not find evidence of any public donations made by fossil fuel companies to the University of Glasgow. Nevertheless, we expect they exist since it is common practice of fossil fuel companies to give donations and sponsorships to universities. These donations do not offset the financial risks associated with heavy investment in fossil fuels, nor do they compensate for the ways in which fossil fuel investments are contrary to the university's values and policies. Two major motivations for corporate donations to universities are advertising and positive publicity. Neither of these objectives would be undermined by divestment, so it is plausible that corporate donations from fossil fuel companies would continue in spite of divestment.

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[770] Deutsche Bank Group, *Sustainable Investing: Establishing Long-term Value and Performance*.
[771] Mercer, *Shedding Light on Responsible Investment: Approaches, Returns and Impacts*.
[772] Steyer, *Letter from Tom Steyer to the Brown Corporation*.
[773] See also: *Steyer, To the Middlebury College Board of Trustees*.

7.12 Shouldn't the University of Glasgow fight climate change through research and education?

The University of Glasgow is active in climate change research and teaching, and this will continue.[774] This research has helped to establish what a serious and pressing problem climate change is for people in the United Kingdom and around the world. Although this work is very welcome, it is not a substitute for divestment. The very existence of the university's Socially Responsible Investment policy shows that the university has accepted the basic argument that some investments are incompatible with the values of the university.

7.13 Won't divestment hurt jobs and the economy in the UK?

This question gets the argument backwards: not dealing with climate change could cause enormous harm to the prosperity of the UK. At the same time, there are major risks associated with continuing to invest hugely in fossil fuel infrastructure, at a time when the policy-makers of the world are starting to get serious about controlling climate change. As detailed extensively in section 3 *The activities of fossil fuel companies are socially injurious, and this social injury cannot be reasonably remedied through shareholder voice*, climate change poses a serious risk to UK prosperity. Furthermore, as detailed in section 4 *Divestment is compatible with the university's fiduciary duties*, there are major risks associated with continuing to invest in fossil fuel projects.

In the beginning of March this year, a report by a committee of influential UK MPs issued a warning concerning the threat that the carbon bubble poses to UK economy.[775] A report by Oxford Economics states: "High and volatile energy prices have a negative effect on the economy of a fossil-fuel importing country such as the UK. They dampen economic activity and they lead to an increase in the price level and potentially an increase in the inflation rate. Since fossil fuels are an input into many goods, both consumers and producers bear losses."[776] The report suggests reducing dependency on fossil fuels to reduce the UK's exposure to developments in the energy market.

As Christiana Figueres, the executive secretary of the UN Framework Convention on Climate Change (UNFCCC), explains, "[w]e will move to a low-carbon world because nature will force us, or because policy will guide us. If we wait until nature forces us, the cost will be astronomical." Given that the future will be carbon constrained, it is urgent that we start reducing our dependence. Divestment by the University of Glasgow would send an important signal to help initiate this necessary transition. As highlighted in the Stern Review: "The benefits of strong, early

[774] See: *The University of Glasgow is already taking action on climate change*, p. 17.
[775] Harvey: *'Carbon bubble' poses serious threat to UK economy, MPs warn.*
[776] Oxford Economics, *A report for the Department of Energy and Climate Change*, p.8.

action on climate change outweigh the costs".[777] Early divestment could also help reduce the risk of large amounts of investment being tied up in fossil fuel projects that will need to be shut down before the end of their economic lives as global and UK restrictions on GHG pollution are tightened. Furthermore, as the world gets serious about decarbonization, many economic opportunities will arise in this sector. The Stern Review concluded that the net benefits of strong climate change mitigation policies would be of the order of $2.5 trillion.[778] These will include the retrofitting of buildings to improve efficiency, the construction of renewable energy infrastructure, and research and development to support and enhance the transition. As a key research institution, the University of Glasgow can participate directly in that part of the world's economic realignment.

7.14 Can't we just adapt to climate change?

As described at considerable length in section 3 *The activities of fossil fuel companies are socially injurious, and this social injury cannot be reasonably remedied through shareholder voice*, the impacts of even 2˚C of climate change would be severe, and a business-as-usual pathway in which we continue to use fossil fuels the way we do now would likely see temperatures up more than 5˚C by 2100.[779]

There is no adapting to climate change that melts the Greenland and West Antarctic ice sheets, flooding huge populated areas. Similarly, climate change on such a scale would be accompanied by an acute risk of abrupt and irreversible effects. In order to have a reasonable chance of adaption that leads to a world with comparable human prosperity to what we enjoy now, climate change must be kept under 2˚C. That means most of the world's fossil fuels cannot be burned, leading to the various implications described in this brief.

7.15 Won't carbon capture and storage (CCS) save us?

Carbon capture and storage (also called carbon capture and sequestration) is a technology that promises to separate CO_2 from the emissions of facilities like power plants and bury it in underground formations such as saline aquifers.[780] The technology has already been deployed in certain applications, such as the re-injection of unwanted CO_2 in the Sleipner gasfield in Norway. CCS cannot solve our climate change problem for two major reasons: scale and economics. Humanity is now emitting roughly 30 billion tonnes of CO_2 into the atmosphere annually.[781] As an article in the *MIT Technology Review* explains: "[I]f we were to bury just one-fifth of the global

[777] Stern, *The Economics of Climate Change: The Stern Review*, p. i.
[778] Ibid., p. xvii.
[779] See also: Act!ionAid, CARE, Germanwatch, and the WWF*, Into Unknown Territory: The Limits to Adaptation and Reality of Loss and Damage from Climate Impacts*.
[780] See also: Carbon capture and storage cannot make fossil fuel extraction compatible with climate stability, p.84.
[781] International Energy Agency, *Redrawing the Energy-Climate Map*.

carbon dioxide emissions, we would need to build an industry capable of handling twice the volume of stuff as the entire oil industry, an industry that took 100 years to develop, driven by a large and mostly expanding market".[782] Rather than being a genuine means for dealing with climate change, CCS has more often been a way for the fossil fuel industry to delay serious government action by claiming that a wonderful technological solution will soon exist. This claim is at odds with the difficulties encountered by test projects like FutureGen — a supposedly 'clean' coal-fired power plant announced by President George W. Bush in 2003, but which was subsequently scrapped because of intolerably high costs. As *The Economist* explains: "there is not a single big power plant using CCS anywhere in the world".[783] On the economics of CCS, *The Economist* explains:

> The problem with CCS is the cost. The chemical steps in the capture consume energy, as do the compression and transport of the carbon dioxide. That will use up a quarter or more of the output of a power station fitted with CCS, according to most estimates. So plants with CCS will need to be at least a third bigger than normal ones to generate the same net amount of power, and will also consume at least a third more fuel. In addition, there is the extra expense of building the capture plant and the injection pipelines. If the storage site is far from the power plant, yet more energy will be needed to move the carbon dioxide.[784]

Despite considerable government subsidies, including $3.4 billion in an American stimulus bill, CCS remains unattractive to energy utilities largely because of cost.[785] In a discussion paper published by the Belfer Center for Science and International Affairs at Harvard, it was estimated that sequestering one tonne of CO_2 would cost approximately $150 — far more than the cost of avoiding the emissions in the first place by implementing lower-cost measures.[786]

Other considerations include the stability of formations into which CO_2 is injected and the seismic consequences of doing so.[787][788] Carbon dioxide is heavier than air, so leaks from CCS facilities could smother people and animals nearby.[789] Water saturated with CO_2 also becomes acidic, which could undermine the integrity of equipment and underground formations intended to contain it. CCS is also useless for mobile sources of emissions like automobiles and aircraft where CO_2 cannot plausibly be separated from waste gases and stored. Given that 85 percent of the total

[782] Bullis, *What Carbon Capture Can't Do*.
[783] The Economist, *Trouble in store*.
[784] The Economist, *Trouble in store*.
[785] The Economist, *The illusion of clean coal*.
[786] Al-Juaied and Whitmore, *Realistic Costs of Carbon Capture*.
[787] Zoback and Gorelick, "Earthquake triggering and large-scale geologic storage of carbon dioxide".
[788] See also: Sheridan, *'Carbon capture' too risky, earthquake prone: US study*.
[789] The Economist, *Trouble in store*.

emissions associated with fuels from the oil sands occur when the fuels are burned in vehicles, this means the scope for decreasing the climate impact of the oil sands with CCS is especially limited.[790] [791]

7.16 Won't geoengineering save us?

Geoengineering is the deliberate modification of the climate system, intended to counteract the effect of anthropogenic climate change. Several different mechanisms for achieving this have been proposed, but all are deeply problematic for a variety of reasons. Geoengineering mechanisms can be broadly broken down into those that would seek to reduce global temperatures without lowering atmospheric CO_2 concentrations and those that would actually seek to draw CO_2 from the atmosphere.

The latter sort — which could theoretically reduce the atmospheric concentration of GHGs — suffers from the same problems of scale and economics experienced by CCS, exacerbated by the additional cost of separating CO_2 from air (where it is relatively low in concentration) rather than directly from the waste stream of power plants and other facilities where it is relatively concentrated.

The former sort, which could be achieved through means like injecting large volumes of sulfate aerosols into the upper atmosphere, suffers from even more significant problems. For one thing, it would do nothing to stop the acidification of the world's oceans: a trend that threatens to destroy the ability of marine organisms to form shells and skeletons from calcium, along with other unknown global effects on marine food webs. For another, geoengineering of this type would be likely to further alter global precipitation patterns, in addition to the changes climate change would create. This sort of intervention would also need to be undertaken constantly and forever; if it were to be discontinued, global temperatures would spike.

In short, geoengineering adds new risks on top of those from climate change, there is no guarantee it would be effective in reducing global temperatures and addressing the other consequences of climate change, and it would be likely to bring significant side-effects. Choosing to geoengineer would mean choosing to impose even more risk and damage upon future generations than we already are.[792]

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[790] Canadian Broadcasting Corporation, *Secret advice to politicians: oilsands emissions hard to scrub*.
[791] McCarthy, *Carbon capture no 'silver bullet'*.
[792] See: Gardiner, "Is 'Arming the Future' with Geoengineering Really the Lesser Evil? Some Doubts about the Ethics of Intentionally Manipulating the Climate System". ". In: Climate Ethics: Essential Readings. Ed. by Stephen M. Gardiner et al. Oxford: Oxford University Press, 2010.

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- *Our Values.* url: http://www.gla.ac.uk/about/values/
- *Policy on Socially Responsible Investment*. URL: http://www.gla.ac.uk/services/finance/staffsections/financialaccounting/financialreporting/endowmentsinvestmentsimportsandvat/sociallyresponsibleinvestmentpolicy/
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9 | APPENDIX I: Issues with respect to university investment

9.1 Policy on Socially Responsible Investment

The University Court is committed to socially responsible investment and will via its Investment Advisory Committee and Pension Scheme Trustees actively encourage its fund managers:

(i) to continue to commit to SRI within their investment policies; and

(ii) to continue to use the Ethical Investment Research Service (EIRIS) (or a similar service) to monitor the behaviour of companies in SRI

When a fund manager does not follow this line, the University should consider whether or not to change the manager at an appropriate and cost-effective point in time.

The one business activity in which the University should continue to instruct its fund managers not to invest is the tobacco industry as such an investment runs entirely counter to the University's direct interests in research.

Fund managers should be asked to supply copies of their voting records in relation to companies where concerns may have been expressed about lack of attention to social, ethical or environmental matters.

Groups from within the University may make representations in respect of an investment or investments held by the University, where those groups have concerns**.** Representations should be made in writing to the Secretary of Court. Such representations will be considered on the following basis:

1. The key criterion against which specific cases would be considered would be whether the activity complained of and substantiated by the concerned group, was wholly contrary to the University's value systems either as reflected in the Mission Statement or the Strategic Plan or in regard to wider issues of social, environmental and humanitarian concern.

2. Expressions of concern should be related to specific companies whose activities or values appear, on the basis of clear evidence, to be so far removed from the University's core values as to give grounds for serious concern. Cases would only be considered if brought forward by the SRC as the recognised student body, or a recognised trade union, or via the University's committee structure.

3. Cases would be considered by a Court group in the first instance. The group will comprise 2 lay members of Court, a Senate Assessor, an SRC representative from Court and the Secretary of Court. The group would be expected to take into account the current extent of the fund managers' engagement with the company with respect to the concerns raised. It would be for the group to decide whether there were sufficiently strong grounds to warrant engagement with the company through the mechanisms established by the fund managers where this was not already in hand, or to request strengthening of that engagement if already active. The group would ask the Investment

Advisory Committee or the Pension Scheme Trustees to communicate with the fund managers about these issues.

4. If a situation arose in which such engagement did not assuage serious concerns raised about a particular company, it might be concluded by the Court on the recommendation of the Court group that it should disinvest in the company. The Investment Advisory Committee or Pension Scheme Trustees would be requested to make the financial consequences of such a decision clear to the group during the course of its deliberations.

The University will publish annually on its website a list of companies and other funds in which investments are held.

An annual report will be made to Court via the Finance Committee in respect of the investment funds.

October 2009

10 | Appendix II: The 200 companies with the largest fossil fuel reserves

The SRC and the Glasgow University Climate Action Society are asking the University of Glasgow to divest from direct stock holdings in the following 200 companies, as listed in the Carbon Tracker Initiative's 2012 report, *Unburnable Carbon*.[793] These are the top 200 listed companies ranked by estimated carbon reserves. In addition, we are asking the university to divest from companies which are not listed here, such as Centrica and Scottish and Southern Energy, but whose primary business is in fossil fuels.

• African Rainbow Minerals Ltd.
• AGL Energy
• Alcoa Inc.
• Allete Inc.
• Alliance Resource Partners L.P.
• Alpha Natural Resources Inc.
• Anadarko Petroleum Corp.
• Anglo American PLC
• Apache Corp.
• Aquila Resources Ltd.
• Arc Resources Ltd.
• ArcelorMittal
• Arch Coal Inc.
• Aston Resources Pty Ltd.
• ATP Oil & Gas Corp.
• Bandanna Energy Ltd.
• Bankers Petroleum Ltd.
• Banpu PCL
• Bashneft
• Baytex Energy Corp.
• Berry Petroleum Co. (Cl A)
• BG Group PLC
• BHP Billiton

[793] Carbon Tracker Initiative, *Unburnable Carbon: Are the world's financial markets carrying a carbon bubble?*

- Black Hills Corp.
- Bonavista Energy Corp
- BP PLC
- Bumi Resources
- Cairn Energy PLC
- Canadian Natural Resources Ltd.
- Canadian Oil Sands Ltd.
- Capital Power Corp.
- Cenovus Energy Inc.
- Chesapeake Energy Corp.
- Chevron Corp.
- China Shenhua Energy Co. Ltd.
- Churchill Mining PLC
- Cimarex Energy Co.
- Cliffs Natural Resources Inc.
- Cloud Peak Energy Inc.
- CLP Holdings Ltd.
- CNOOC Ltd.
- Coal India Ltd.
- Coal of Africa Ltd.
- Compania Espanola de Petroleos S.A.
- Concho Resources Inc.
- ConocoPhillips
- Consol Energy Inc.
- Continental Resources Inc. Oklahoma
- Crescent Point Energy Corp.
- Datang International Power Generation Co. Ltd.
- Datong Coal Industry Co. Ltd.
- Denbury Resources Inc.
- Devon Energy Corp.
- Ecopetrol S.A.
- El Paso Corp.
- EnCana Corp.
- Energen Corp.
- Enerplus Corp.

- ENI S.p.A.
- EOG Resources Inc.
- EQT Corp.
- Eurasian Natural Resources Corp. PLC
- Evraz Group S.A.
- Exxaro Resources Ltd.
- Exxon Mobil Corp.
- FirstEnergy Corp.
- Forest Oil Corp.
- Fortune Minerals Ltd.
- Fushan International Energy Group Ltd.
- Gansu Jingyuan Coal Industry & Electricity Power
- Gazprom OAO
- GDF Suez S.A.
- Global Energy Development PLC
- Grupo Mexico S.A.B. de C.V.
- Gujarat NRE Coke Ltd.
- Gujarat NRE Coking Coal Ltd.
- Hess Corp.
- Homeland Energy Group Ltd.
- Huolinhe Opencut Coal Industry Corp. Ltd.
- Husky Energy Inc.
- Idemitsu Kosan Co. Ltd.
- Imperial Oil Ltd.
- INA-Industrija Nafte
- Inner Mongolia Yitai Coal Co. Ltd.
- Inpex Corp.
- International Coal Group Inc.
- Irkutskenergo
- Itochu Corp.
- James River Coal Co.
- Jindal Steel & Power Ltd.
- Jizhong Energy Resources Co. Ltd.
- Kazakhmys PLC
- Kuzbassenergo

- Linn Energy LLC
- Lukoil Holdings
- Lundin Petroleum AB
- Macarthur Coal Pty Ltd.
- Magnitogorsk Iron & Steel Works
- Marathon Oil Corp.
- Mariner Energy
- Massey Energy Co.
- Mechel OAO
- Mitsubishi Corp.
- Mitsui & Co. Ltd.
- Mitsui Matsushima Co. Ltd.
- MOL Hungarian Oil and Gas Plc
- Mongolian Mining Corp.
- Murphy Oil Corp.
- NACCO Industries Inc. (Cl A)
- New Hope Corp. Ltd.
- New World Resources N.V.
- Newfield Exploration Co.
- Nexen Inc.
- Neyveli Lignite Corp. Ltd.
- Noble Energy Inc.
- Noble Group Ltd
- Northern Energy Corp. Ltd.
- Novatek
- Novolipetsk Steel OJSC
- NTPC Ltd
- Occidental Petroleum Corp.
- Oil & Natural Gas Corp. Ltd.
- Oil India Ltd.
- Oil Search Ltd.
- OMV AG
- Optimum Coal Holdings Ltd.
- PA Resources AB
- Pacific Rubiales Energy Corp.

• Patriot Coal Corp.
• Peabody Energy Corp.
• Pengrowth Energy Corp.
• Penn West Petroleum Ltd.
• PetroBakken Energy Ltd.
• Petrobank Energy & Resources Ltd.
• Petrobras
• Petroleum Development Corp.
• Pingdingshan Tianan Coal Mining Co. Ltd.
• Pioneer Natural Resources Co.
• Plains Exploration & Production Co.
• Polo Resources Ltd.
• Polyus Gold OAO
• Premier Oil PLC
• Prophecy Resource Corp.
• PT Adaro Energy
• PT Bayan Resources
• PTT PCL
• Public Power Corp. S.A.
• Questar Corp.
• Quicksilver Resources Inc.
• Range Resources Corp.
• Raspadskaya OJSC
• Repsol YPF S.A.
• Resolute Energy Corp.
• Rio Tinto
• Rosneft
• Royal Dutch Shell PLC
• RWE AG
• SandRidge Energy Inc.
• Santos Ltd.
• Sasol Ltd.
• Severstal JSC
• Shanxi Coking Co. Ltd.
• Sherritt International Corp.

- SINOPEC Shandong Taishan Petroleum Co. Ltd.
- SK Holdings Co. Ltd.
- SM Energy Co.
- Soco International PLC
- Southwestern Energy Co.
- Statoil ASA
- Straits Asia Resources Ltd.
- Suncor Energy Inc.
- Swift Energy Co.
- Talisman Energy Inc.
- Tata Power Co. Ltd.
- Tata Steel Ltd.
- Teck Resources Ltd.
- Tokyo Electric Power Co. Inc.
- Total S.A.
- TransAlta Corp.
- Tullow Oil PLC
- Ultra Petroleum Corp.
- United Co. Rusal PLC
- United Industrial Corp. Ltd.
- Vale SA
- Venoco Inc.
- Walter Energy, Inc.
- Wescoal Holdings Ltd.
- Wesfarmers Ltd.
- Western Coal Corp.
- Westmoreland Coal Co.
- Whitehaven Coal Ltd.
- Whiting Petroleum Corp.
- Williams Cos.
- Woodside Petroleum Ltd.
- Xstrata PLC
- Yanzhou Coal Mining Co. Ltd.
- YPF S.A.
- Zhaikmunai L.P.

• Zhengzhou Coal Industry & Electric Power Co. Ltd.

University of Glasgow

Court - Wednesday 25 June 2014

Report from the Secretary of Court

SECTION A - ITEMS FOR DISCUSSION / DECISION

A.1 *Socially Responsible Investment Policy – Fossil Fuel investment*

At the February meeting, Court approved the setting up of a group to consider representations submitted from the University Climate Action Society (via the SRC) for the University to divest from fossil fuel industry companies in accordance with the University's Policy on Socially Responsible Investment.

The working group involved two lay members of Court (Graeme Bissett and Murdoch MacLennan), one Senate assessor (Marie Freel), one SRC representative on Court (Donald Mackay) and the Secretary of Court.

The group met on 16 May to consider the document provided by the Climate Action Society and to hear representations from four of its members. Since then, the group has contacted the Investment Advisory Committee for its views on potential disinvestment in fossil fuel extractors (oil/gas/coal extraction), which is the area which the CAS members who attended the meeting clarified was the focus of the campaign.

Annex 1 contains the report of the group's meeting on 16 May, which Court is asked to note. The group will receive the views of the Investment Advisory Committee before Court meets, and I will update Court on what the group would like to recommend in the light of that advice.

Court group convened under Socially Responsible Investment Policy
16 May 2014 2pm in the Principal's Meeting Room

Present: Graeme Bissett, Marie Freel, Donald Mackay, Murdoch MacLennan, David Newall, Deborah Maddern

A request had been made via a petition co-ordinated by the GU Climate Action Society, for the University to cease investing in fossil fuel companies.

The group heard that the University's endowment funds were managed by 2 brokers. Funds were invested to provide a return for staff and student activities.

The group met with 4 representatives of the Climate Action Society (CAS). The representatives explained that they understood the University's financial responsibilities to the institution, but considered that a moral responsibility was not being upheld. In response to a suggestion from the Court group that the University also had a moral responsibility to provide scholarships and other support from the endowment funds, the CAS replied that investment in fossil fuels was not risk free and was not an essential long-term investment: no losses had been reported in studies of funds where such investment was not made - the funds did just as well over a 2 year period. It was also pointed out that Glasgow alumni might be keener to donate to the University if it disinvested in fossil fuels.

The CAS was asked where the line would be drawn, for example would 'downstream' organisations such a chemical companies also be targeted for disinvestment. The CAS confirmed it was looking at oil and gas only. The Court group commented that the list if organisations that had been supplied as part of the petition also included distributors. The CAS confirmed that only extractors would be the priority.

The Court group commented that lobbying the government was an option, with the aim of financial regimes inducing a change of direction by oil and gas companies, although it noted that this was a balancing act given that costs might be passed on to consumers. The CAS considered that a number of costs associated with health problems and pollution were not picked up by the companies presently. The CAS was also asking for a social movement in favour of disinvestment, which was why the University was being approached.

The CAS was asked about the potential impact on developing countries, who might suffer if there was pressure to reduce use of fossil fuels. The CAS responded that such countries were being adversely affected by climate change caused by overuse of fossil fuels by developed countries, for example by hurricanes. These countries were also interested in greener technologies; some had asked for assistance in developing these. They were open to these renewable technologies, which might be on a smaller scale, that would suit them.

The CAS reiterated statistics in the paper that had been circulated, referring to a 2 degree target and the fact that current usage (burning of fossil fuels) would not achieve this. CAS considered that the science was widely agreed worldwide, but the world was not acting. Carbon capture, a possible remedial action, had not started early enough.

It was noted that the NUS had endorsed the campaign in the current week. Other universities were also looking into the matter. A US university had pledged to disinvest.

With regard to the 5 year timescale proposed to the University of Glasgow to disinvest, the CAS explained that this was being proposed as a reasonable timescale. The CAS was not being prescriptive about what the University might invest in instead of fossil fuels: the CAS want the best return for the University and does not want it to suffer financial hardship. In response to a suggestion about a possible longer timescale, perhaps 15 years to align with the emergence of green technologies, and to acknowledge that medical and scientific developments need the input of the fossil fuel industry, the CAS view was that the world was running out of time and could not keep pushing back timescales. The CAS mentioned that Norway was stepping back from the fossil fuel industry in some measure.

The CAS explained that the list of companies had been provided by the parent organization, and contained distributors as well as extractors of fuels. The CAS would revert to DN on this matter.

The CAS explained that, in summary, the University owed it to current and future students and staff to disinvest in fossil fuel companies.

The CAS was thanked for presenting its case and for the quality of the content.

Points and actions agreed by Court group:

- Agreed that the case had been excellently presented by the CAS, which was to be commended.
- Agreed that the Investment Advisory Committee would be consulted for its views on divestment and the effect that this might have on the health of the funds. This view to include any comments about possible timescales.
- Agreed that University services dealing with funding (grant/donations) would be contacted to establish current levels of funding from the fossil fuel industry. Noted that disinvestment might be of benefit in terms of income and marketing.
- Agreed on the basis of general but not expert knowledge of the subject-matter, that the balance of evidence supports the concerns expressed by CAS about climate change and the linkage to fossil fuels.
- Recognised that the scale of the University's investment in the major Oil & Gas companies, although significant to our portfolio, meant that any divestment would exert very limited financial pressure on the investee companies, so that action of that type would be symbolic.
- Agreed that such action could nonetheless have important symbolic impact in the general debate.
- Agreed that subject to understanding the wider implications of the further information being sought, that progressive divestment over a relatively long period could demonstrate a long-term intent in tune with wider efforts to displace fossil fuel based energy sources with greener alternatives.
- Agree that fund managers could as part of this strategy be encouraged to identify green energy investments which would continue to fulfil the University's fiduciary obligations.

To Members of Court

Socially Responsible Investment

Item A.1 of the Secretary's Report to Court, together with Annex 1, discusses the views of the group Court asked to consider a representation made by the Glasgow University Climate Action Society in terms of the University's Socially Responsible Investment Policy.

Since the group last met, it has received comments from members of the Investment Advisory Committee on the impact that disinvestment in Fossil Fuel extraction might have on the health of the University's investments. It has also checked the extent to which the University benefits from financial support from the Fossil Fuel extraction industry.

Members of the Investment Advisory Committee have expressed a range of views. If there is a consensus, it is that disinvestment should be over a lengthy period, and that the University might expect there to be a small reduction in portfolio returns. The working group also considered that disinvestment should be over a lengthy period and that a modest risk to financial returns existed. However, the group heard other evidence that was more encouraging, and it noted that one of the University's two brokers currently places less than 5% of its investment portfolio with the Fossil Fuel industry. Turning to the level of investment by the Fossil Fuel industry in the University, our research funding from the industry is small, being less than 0.2% of the University's research holdings.

The conclusion of the Working Group is that it supports the ethical case for disinvesting from the Fossil Fuel industry, that it recognises this would involve a modest risk to the financial return on the University's investments, and that it believes this risk can be effectively managed by disinvesting over a substantial period of time.

The working group therefore recommends that Court ask the Investment Advisory Committee:

1 **to cap the University's investment in the Fossil Fuel industry such that it will not rise above the current level of 10% of funds invested;**

2. **to reduce this level of investment to 5% by June 2019, and to zero by 2024.**

3. **to require the University's fund managers to identify strategies to mitigate the financial risk associated with this instruction;**

4. **to require the fund managers also to consider investment in green energy, where this is consistent with achieving the financial targets set by the University; and**

5. **to monitor the managers' response to these requirements and to report to Court in 2 years' time.**

DN, 23.6.14

University of Glasgow

Court

Minute of Meeting held on Wednesday 25 June 2014 in the Senate Room

Extract

CRT/2013/52. Report from the Secretary of Court

CRT/2013/52.1 Socially Responsible Investment Policy – Fossil Fuel

At the February meeting, Court had approved the setting up of a working group to consider representations submitted by the Glasgow University Climate Action Society (GUCAS), via the SRC, for the University to divest from fossil fuel industry companies in accordance with the University's Policy on Socially Responsible Investment (SRIP). The working group had involved two lay members of Court (Graeme Bissett and Murdoch MacLennan), one Senate Assessor (Marie Freel), one SRC representative on Court (Donald Mackay) and the Secretary of Court.

The group had met on 16 May to consider the document provided by GUCAS and to hear representations from four of its members. Since then, the group had contacted the Investment Advisory Committee IAC for its views on potential disinvestment in fossil fuel extractors (oil/gas/coal extraction), which was the area which the GUCAS members who attended the meeting had clarified was the focus of the campaign. Court heard that IAC members had expressed a range of views; if there was a consensus, it was that disinvestment should be over a lengthy period, and that the University might expect there to be a small reduction in portfolio returns.

The working group had itself also considered that disinvestment should be over a lengthy period; and that a modest risk to financial returns existed. The group had however noted that one of the University's two brokers currently placed less than 5% of its investment portfolio with the fossil fuel industry. The level of investment by the fossil fuel industry in the University in terms of research funding and donations from the industry was small. The conclusion of the Working Group had been that it supported the ethical case for disinvesting from the fossil fuel extraction industry, that it recognised this would involve a modest risk to the financial return on the University's investments, and that it believed that this risk could be effectively managed by disinvesting over a substantial period of time. It had made recommendations to Court accordingly.

At the meeting, Court noted from the working group's members that the case for climate change being a fact had been taken as made, that the group had been strongly persuaded by the quality of the arguments presented by the GUCAS, and that for the University to take a lead in the area of disinvestment from the fossil fuel extraction industry would be a positive symbolic step. It would also see the University taking a lead as an early supporter of the proposal, which it was understood was being considered by a number of institutions worldwide. While it had not received formal representations from bodies that were opposed to what GUCAS was suggesting, the group had considered potential downsides, in particular the potential loss of income both from investments and funding, but had concluded that on balance it would

recommend progressive disinvestment and that instructions should be given to fund managers to this effect.

In discussion, mixed views were expressed by Court members. Concerns were raised as to whether alternative arguments had been examined as part of the process; Court heard in response to this point that details of University funding from the fossil fuel extraction industry had been sought and the IAC had been consulted for its views. Reference was made to the terms of the SRIP, namely that *"the key criterion against which specific cases would be considered would be whether the activity complained of and substantiated by the concerned group, was wholly contrary to the University's value systems either as reflected in the Mission Statement or the Strategic Plan or in regard to wider issues of social, environmental and humanitarian concern";* it was questioned whether this criterion could be said to be the case here, for example in the context of the University recently having recently approved a gas-powered Combined Heat & Power system. Against this, reference was made to the University's commitment to carbon reduction via its Carbon Management Plan. It was also confirmed that the terms of the SRIP had indeed been considered by group, and reflected in its recommendation that a phased disinvestment take place, the decision having been taken that the GUCAS proposal did not fit neatly on one side or the other of the criterion, but that environmental damage was nevertheless a key challenge for the current times: it was argued that the idea of not reducing the impact of fossil fuel extraction in this wider global context could indeed be considered as 'wholly contrary' to the University's value systems.

Court heard views that ensuring the maximum returns from investments was vital for funding scholarships. The University's portfolio could be negatively affected by the proposed disinvestment, since few companies had such good yields as the fossil fuel companies in question, and were also riskier investments. It might also be difficult properly to clarify which companies could be classified as extractors. Such companies might also in time take the lead in developing alternatives to fossil fuels. Concerns were also expressed about the effect on University funding, although it was noted that the present level of both philanthropic donations and direct research funding from the industry was small. It was commented that the reverse might in fact apply, that other companies might be positively encouraged to support the University if it disinvested in the fossil fuel industry, since the move could add value to the University's attractiveness to funders.

It was agreed that more information was needed to inform a decision, and that as such the matter should be reviewed further by the working group over the summer, with specific proposals to be presented and discussed further at the October 2014 meeting of Court. In particular, information would be provided to link the GUCAS concerns about investments in the fossil fuel industry to the SRIP criterion of this being 'wholly contrary' to the University's value system. Greater clarity would also be provided on the potential risks and impact on University income, which needed to be quantified as best as possible, and should include consideration of the potential difficulty in accepting funding from fossil fuel extraction companies in the future. Individual Court members were invited to submit details of any other points for consideration by the group.

It was noted that the basic case about climate change being a fact would not be re-considered by the group and would be taken as given.

University of Glasgow

Court - Wednesday 8 October 2014

Report from the Secretary of Court

A.3 *Socially Responsible Investment Policy – Fossil Fuels*

Following discussion at the June meeting, the working group was asked to present more fully the case for disinvestment from the Fossil Fuel industry, and to address concerns voiced by Court members.

There was an opportunity for discussion of this matter at the Court Strategy Day on 30 September. **Annex 4** contains the working group's second report (including recommendations) and previous papers on the matter by way of background, for further discussion at the Court meeting.

Annex 4

Socially Responsible Investment Policy – Fossil Fuel Extraction Industry

Second Report from the Court Working Group

(Graeme Bissett, Marie Freel, Donald Mackay, Murdoch MacLennan, David Newall)

1 Summary and Recommendation

In June, Court discussed a paper from our working group, which was formed to consider the case for disinvestment from the fossil fuel extraction industry. A range of views was expressed, and the working group was asked to consider the matter further and report back.

The working group has reflected on the discussion at Court and has produced this current paper as a contribution to the follow-up discussion anticipated to take place at the October Court meeting. The paper reiterates the case for disinvestment and puts this in the wider context of the University's response to climate change and commitment to reduce carbon consumption. The paper also discusses various reservations that have been expressed by Court members. This is a difficult issue. We recognize the sense behind the concerns expressed at the June meeting and acknowledge that unanimity of view at Court is unlikely. However, as the group tasked to consider this matter on Court's behalf, our recommendation is that the University should indeed gradually reduce its investment in the fossil fuel extraction industry. We have reformulated our recommendation, which was felt by some members to be too prescriptive, and now RECOMMEND:

.1 that the University's direct investment in the fossil fuel extraction industry should be managed in a controlled manner such that the value of such investments does not exceed the current level of 10% of the endowment portfolio for any appreciable time period; and

.2 that the current level of investment should be reduced to zero over the next 10 years, subject to Recommendation 3 and bi-annual re-evaluation of the financial and other impacts of the divestment policy on the University along with the scope for increased investment in renewable energy sources.

.3 that prior to executing Recommendation 2, a further examination of the financial impact of that Recommendation be conducted through dialogue with the Glasgow University Climate Action Society (GUCAS) and the University's Investment Committee to provide assurance to Court as to the limited scale of the prospective financial impact.

The companies from which we are recommending disinvestment are those whose primary activity is fossil fuel extraction. The University's current investment in these companies is valued at approximately £18M.

2 Why the working group recommends disinvestment

The working group was asked by Court to consider the case for disinvestment as submitted by the Glasgow University Climate Action Society (GUCAS). The GUCAS submission has been circulated separately for reference. Having reviewed it and discussed it with members of GUCAS, the working group decided, unanimously, to recommend to Court that the University should, over a period of time, disinvest from the fossil fuel extraction industry. The case put forward by GUCAS included a number of important arguments in support of disinvestment, which the working group found persuasive in arriving at their recommendation. Those arguments included the following :

.1 *Continued consumption of fossil fuel at current rates will do serious damage to the planet*

The Copenhagen Accord (2009) saw the world's governments commit to take action to cap the rise in global temperatures at a figure 2% above the pre-industrial level. That 2% target was chosen on scientific advice as a dangerous threshold beyond which serious damage would be done to food and water supplies, to the sustainability of human environments, and to the ecosystem. The actions taken by governments to date are not addressing that target. The consumption of carbon based fuels continues to rise and, on current estimates, we will have reached a point in 15 years where it will no longer be possible to restrict the temperature rise to 2%.

.2 *The fossil fuel industry is not meeting the environmental and social costs which will arise from its activity*

Fossil fuel extraction companies are addressing the important task of generating supply to meet global demand. In doing so, they are operating profitably, and they therefore represent an attractive investment for the University's funds. But the demand they are meeting cannot continue without doing serious damage to the environment. As a result, the industry is overvalued, with its profitability based on a false assumption that it is possible for the world to continue to burn carbon at current rates.

.3 *Others will pay a heavy price for our consumption of carbon*

Those of us who live in the developed world ought to be mindful of the dramatic impact that climate change may have on future generations and on poorer and more vulnerable communities throughout the world. Our descendants, and in particular those who live in poorer countries, may pay a heavy price for the benefits we currently enjoy through

consuming carbon at the current unsustainable level. There is a powerful ethical argument for the University to take action.

.4 *Social pressure is required to persuade governments to do more*

Governments of course have a crucial role to play in addressing climate change. But government action to date has been inadequate. There is a need for greater social awareness and popular pressure if political parties and governments are to give this issue the priority it merits. In the United States, several cities and universities have made commitments to disinvest from fossil fuels. In the UK, the British Medical Association resolved in June 2014 to transfer their investments from fossil fuels to renewables. Several UK universities are considering similar action, but at this point none has made a commitment. As a respected institution, the University can play an important role in influencing popular opinion and government action.

3 Consistency with the University's values and commitments

In 2009, the University signed the Universities & Colleges Climate Commitment for Scotland. This recognized the deep impact climate change could have on the world's economy, society and environment, and supported the Scottish Government's stated intention to reduce carbon emissions by 80% by the Year 2050. Consistent with that commitment, the University's Carbon Management Plan aims to achieve a 20% reduction in the University's energy consumption by 2015/16, a target that is being addressed through improved energy efficiency and a campaign to reduce consumption. The University has joined other public sector organizations in Scotland to procure 100% renewable electricity supplies for a substantial part of its estate. Its capital building programme is driving improvements through investment in energy efficiency and the achievement of BREEAM excellent standards for new build. It is implementing sustainable travel initiatives in the areas of cycling, public transport and electric vehicles. And it is promoting awareness of sustainability among staff (through green champions) and students (through GUEST, the Glasgow University Environmental Sustainability Team). It would be entirely consistent with this ethos if the University were to supplement its existing range of sustainability initiatives with a commitment steadily to disinvest from the fossil fuel industry.

4 Reservations raised about a policy of disinvestment

Some members of Court have expressed concerns regarding the recommended policy of disinvestment, either at the June meeting or in subsequent email correspondence. The following paragraphs identify and comment on the main points that have been raised.

.1 *The action proposed is not consistent with Court's socially responsible investment policy*

Court approved a Socially Responsible Investment Policy in 2009. Referring to it, several members of Court have asked whether investment in fossil fuels can really be considered to be *'wholly contrary to the University's value systems, either as reflected in the Mission Statement or the Strategic Plan or in regard to wider issues of social, environmental and humanitarian concern.'* In addition, it has been pointed out that the socially responsible investment policy states that, before deciding to disinvest from a company on ethical grounds, the Court working group should seek to initiate dialogue with the relevant company/ies via the fund managers.

There is an obvious truth that consuming carbon remains essential to normal life and that a connection can readily be made from that reality to investment in fossil fuel extraction. Stated that way, such investment could not easily be regarded as wholly contrary to the University's value systems as they sit today. But, having identified the threat to the environment both today and in the future, action is being taken by the University to reduce its carbon consumption. The ethos underpinning such action represents an important part of the University's value systems. Action which did not reflect or ran counter to this important aspect of the University's value systems could reasonably be argued to be wholly contrary to those value systems. We are not proposing a sudden disinvestment from fossil fuel companies, but instead disinvestment over an extended period, which would be consistent with the University's existing commitment steadily to reduce its carbon consumption. The question of whether a matter is "contrary" or "wholly contrary" could be debated at length. We respect the need to pass the test in the Policy statement and that the words were crafted in that form for a purpose. We would counsel however that we do not allow a judgment on semantics to obscure the more fundamental reality. The term "wholly contrary" is an absolute and in this context is being applied to subjective matters in which very little is of an absolute nature. Accordingly, our view is that it would be contrary, and can reasonably be argued to be wholly contrary, to the University's value systems to take no action on fossil fuel investment.

The second point raised above is that the socially responsible investment policy states that there should be engagement with the companies involved before any decision by Court to disinvest. While this could be a useful course of action in certain cases, it is not a practical way forward in relation to fossil fuel extraction (or indeed to tobacco manufacture), where it is the primary purpose of the company that is the concern.

.2 *Disinvestment will reduce the return on the University's investments and will therefore harm future students*

In making a case for disinvestment, the working group considered that, by reducing the options available to the university's funds managers, its proposal might have a small negative effect on the University's rate of return. That view seems, generally, to be held by members of the University's Investment Advisory Committee. However, we would make four points.

- The scale of the loss would be manageable based on the advice we have received from the members of the Committee. If, for example, we were to assume a 0.25% deterioration in return on the £18M currently invested in fossil fuel extraction, then the annual loss to the University's endowment income would be £45,000.
- It is arguable whether there would be any loss. There are examples of socially responsible investment funds - such as Portfolio 21 and NEI Ethical Canadian Dividend Fund - that have outperformed benchmarks after making the decision to disinvest from the fossil fuel industry.
- The fossil fuel industry may well be seriously overvalued at present, as it is not covering the social and environmental costs of its activities. Rates of return may therefore decline substantially in the years ahead so that any deterioration in return may be limited in timescale.
- Finally, we would argue that, if Court accepts the argument for disinvestment based on the University's values, then it should agree to disinvest, even although this may involve reduced income in the short term.

.3 *Disinvestment could impact on funding opportunities with the fossil fuel industry*

In reporting to Court in June, the working group investigated the extent to which the University currently benefits from funding from the fossil fuel industry. Current research funding is £350,000, which is 0.2% of the Research portfolio. Funding in support of the University's development campaign is nil. Now, it is possible that future opportunities for financial support from the fossil fuel industry might be lost should Court agree to disinvest. Set against that, the University may find that some other funding opportunities are enhanced should it take a stance on fossil fuel industry disinvestment. As with the concern regarding a possible reduction in income from investments, the working group considers that the over-riding concern should be whether Court is convinced of the case for disinvestment based on the University's values. If so, then it ought to disinvest.

.4 *This would be a symbolic gesture only, with no practical impact*

Reservations have been expressed about the University becoming involved in gesture politics, which may have no practical impact. We recognise this concern, and are aware that the University's decision could be presented in a cynical light. However, we would argue that symbolism is important, particularly on the part of a respected institution like the University which has the ability to influence the thinking of its students, government and of the wider public.

.5 *This action would be inconsistent and inappropriate in view of the benefit the University derives from the fossil fuel industry*

Several members of Court consider that a decision to disinvest would not be responsible at a time when the University will continue to enjoy the benefits of fossil fuels. Indeed, it could be argued that it would be hypocritical for the University to disinvest from an industry on which it relies. Two, related, points have been made in this regard:

- that the University will continue to burn fossil fuels for many years to come, and indeed that it has just recently committed to a major investment in a gas-fired combined heat and power facility; and
- that the University benefits from the contribution the fossil fuel industry makes to the national economy, including to the tax revenues that help fund higher education.

These are undoubtedly important concerns. On the other hand, we have already committed in the Carbon Management Plan to reduce the University's reliance on fossil fuels. In doing this, we have recognized that this will not happen overnight and that the University will continue to consume fossil fuels for years to come. A decision to disinvest steadily over a period of several years is consistent with the University's commitment to reduce its carbon footprint over a period of several years. The University will be dependent on fossil fuels for many years to come, but it would be irresponsible not to take action over time to reduce our dependence.

.6 *If the University decides to disinvest from fossil fuels then it will open the door to lobbying on a range of other issues*

If Court agrees to disinvest from fossil fuels, will Court then be subject to lobbying in relation to other investments? Possibly, yes. But, in approving the socially responsible investment policy in 2009, Court provided a mechanism for considering submissions of this sort, and each submission should be considered on its merits. In the view of the working group, the case for disinvestment from the fossil fuel industry is a powerful one that merits support.

.7 *How effective can such a policy be, given practical realities?*

Finally, the working group's recommendation to Court is that disinvestment should be made from those direct investments in companies whose primary activity is fossil fuel extraction. It has a specific list of the investments involved, which have a total value of approximately £18M. It has been asked whether this approach would really be effective in addressing its intended objectives, given that: a) funds invested in vehicles that encompass a mixed portfolio of shares may ultimately find their way into the same fossil fuel extraction companies; b) the companies identified are not necessarily engaged exclusively in the activity of fossil fuel extraction; and c) there are other companies, not on the list, which work with fossil fuels, albeit not primarily as extractors.

No proposal on disinvestment, however carefully framed, will be perfect, and similar reservations could also be expressed in relation to the Tobacco industry, in which the University has, as a matter of policy, not made direct investment for many years. The working group's recommended policy on fossil fuels is similar in this respect to that already in operation for Tobacco; that the University should reduce its direct investment in companies whose primary activity is fossil fuel extraction. We think that is a practical definition that provides clarity for our investment managers.

DN, GB, 19.8.14

Background to second SRIP group report: Previous papers on SRIP (Fossil Fuels)

Secretary's report to Court 12 February 2014:

A.3 *Socially Responsible Investment Policy*

Court may remember that the above policy was approved in 2009 and contains a provision whereby groups from within the University may make representations in respect of an investment or investments held by the University, where those groups have concerns.

Following the last meeting of SRC Council, a request has been made that the University of Glasgow divest from fossil fuel industry companies in accordance with the University's Policy on Socially Responsible Investment.

A summary of the motion passed at the SRC Council meeting is:-

"The SRC notes that the University of Glasgow has signed up to the Environmental Association of Universities and Colleges initiative entitled 'Universities and Colleges Climate Change Commitment for Scotland' which is a public declaration of the University's intent to address climate change, and that the University intends to reduce its carbon emissions by 80% by the year 2050.

The SRC believe that these commitments are undermined by the fact that the University has investments in fossil fuel companies including Shell, BP, Chevron, Billiton and Centrica currently totalling nearly £19million. The fossil fuel industry, by extracting, processing, promoting and facilitating the use of, selling and profiting from fossil fuels, is complicit in causing climate change and its catastrophic impacts. Our University should be a role model in society and take the lead amongst UK universities by acting responsibly and helping to create a safer and cleaner future.

Therefore the SRC urge that the University extend its commitment to tackling climate change to its investment portfolio and divest from the fossil fuel companies named above within a reasonable time frame to be agreed between SRC and the University".

In accordance with the Socially Responsible Investment Policy [annexed] a working group will be established to consider this representation and advise Court. The working group will comprise: two lay members of Court, one Senate assessor, one SRC representative on Court and the Secretary of Court.

A.1 *Socially Responsible Investment Policy – Fossil Fuel investment*

At the February meeting, Court approved the setting up of a group to consider representations submitted from the University Climate Action Society (via the SRC) for the University to divest from fossil fuel industry companies in accordance with the University's Policy on Socially Responsible Investment.

The working group involved two lay members of Court (Graeme Bissett and Murdoch MacLennan), one Senate assessor (Marie Freel), one SRC representative on Court (Donald Mackay) and the Secretary of Court.

The group met on 16 May to consider the document provided by the Climate Action Society and to hear representations from four of its members. Since then, the group has contacted the Investment Advisory Committee for its views on potential disinvestment in fossil fuel extractors (oil/gas/coal extraction), which is the area which the CAS members who attended the meeting clarified was the focus of the campaign.

[**Annex]** contains the report of the group's meeting on 16 May, which Court is asked to note. The group will receive the views of the Investment Advisory Committee before Court meets, and I will update Court on what the group would like to recommend in the light of that advice.

[Annex]

Court group convened under Socially Responsible Investment Policy

16 May 2014 2pm in the Principal's Meeting Room

Present: Graeme Bissett, Marie Freel, Donald Mackay, Murdoch MacLennan,

David Newall, Deborah Maddern

A request had been made via a petition co-ordinated by the GU Climate Action Society, for the University to cease investing in fossil fuel companies.

The group heard that the University's endowment funds were managed by 2 brokers. Funds were invested to provide a return for staff and student activities.

The group met with 4 representatives of the Climate Action Society (CAS). The representatives explained that they understood the University's financial responsibilities to the institution, but considered that a moral responsibility was not being upheld. In response to a suggestion from the Court group that the University also had a moral responsibility to provide scholarships and other support from the endowment funds, the CAS replied that investment in fossil fuels was not risk free and was not an essential long-term investment: no losses had been reported in studies of funds where such investment was not made - the funds did just as well over a 2 year period. It was also pointed out that Glasgow alumni might be keener to donate to the University if it disinvested in fossil fuels.

The CAS was asked where the line would be drawn, for example would 'downstream' organisations such a chemical companies also be targeted for disinvestment. The CAS

confirmed it was looking at oil and gas only. The Court group commented that the list if organisations that had been supplied as part of the petition also included distributors. The CAS confirmed that only extractors would be the priority.

The Court group commented that lobbying the government was an option, with the aim of financial regimes inducing a change of direction by oil and gas companies, although it noted that this was a balancing act given that costs might be passed on to consumers. The CAS considered that a number of costs associated with health problems and pollution were not picked up by the companies presently. The CAS was also asking for a social movement in favour of disinvestment, which was why the University was being approached.

The CAS was asked about the potential impact on developing countries, who might suffer if there was pressure to reduce use of fossil fuels. The CAS responded that such countries were being adversely affected by climate change caused by overuse of fossil fuels by developed countries, for example by hurricanes. These countries were also interested in greener technologies; some had asked for assistance in developing these. They were open to these renewable technologies, which might be on a smaller scale, that would suit them.

The CAS reiterated statistics in the paper that had been circulated, referring to a 2 degree target and the fact that current usage (burning of fossil fuels) would not achieve this. CAS considered that the science was widely agreed worldwide, but the world was not acting. Carbon capture, a possible remedial action, had not started early enough.

It was noted that the NUS had endorsed the campaign in the current week. Other universities were also looking into the matter. A US university had pledged to disinvest.

With regard to the 5 year timescale proposed to the University of Glasgow to disinvest, the CAS explained that this was being proposed as a reasonable timescale. The CAS was not being prescriptive about what the University might invest in instead of fossil fuels: the CAS want the best return for the University and does not want it to suffer financial hardship. In response to a suggestion about a possible longer timescale, perhaps 15 years to align with the emergence of green technologies, and to acknowledge that medical and scientific developments need the input of the fossil fuel industry, the CAS view was that the world was running out of time and could not keep pushing back timescales. The CAS mentioned that Norway was stepping back from the fossil fuel industry in some measure.

The CAS explained that the list of companies had been provided by the parent organization, and contained distributors as well as extractors of fuels. The CAS would revert to DN on this matter.

The CAS explained that, in summary, the University owed it to current and future students and staff to disinvest in fossil fuel companies.

The CAS was thanked for presenting its case and for the quality of the content.

Points and actions agreed by Court group:

- Agreed that the case had been excellently presented by the CAS, which was to be commended.
- Agreed that the Investment Advisory Committee would be consulted for its views on divestment and the effect that this might have on the health of the funds. This view

to include any comments about possible timescales.

- Agreed that University services dealing with funding (grant/donations) would be contacted to establish current levels of funding from the fossil fuel industry. Noted that disinvestment might be of benefit in terms of income and marketing.
- Agreed on the basis of general but not expert knowledge of the subject-matter, that the balance of evidence supports the concerns expressed by CAS about climate change and the linkage to fossil fuels.
- Recognised that the scale of the University's investment in the major Oil & Gas companies, although significant to our portfolio, meant that any divestment would exert very limited financial pressure on the investee companies, so that action of that type would be symbolic.
- Agreed that such action could nonetheless have important symbolic impact in the general debate.
- Agreed that subject to understanding the wider implications of the further information being sought, that progressive divestment over a relatively long period could demonstrate a long-term intent in tune with wider efforts to displace fossil fuel based energy sources with greener alternatives.
- Agree that fund managers could as part of this strategy be encouraged to identify green energy investments which would continue to fulfil the University's fiduciary obligations.

Additional paper for 25 June 2014 Court meeting:

To Members of Court

Socially Responsible Investment

Item A.1 of the Secretary's Report to Court, together with Annex 1, discusses the views of the group Court asked to consider a representation made by the Glasgow University Climate Action Society in terms of the University's Socially Responsible Investment Policy.

Since the group last met, it has received comments from members of the Investment Advisory Committee on the impact that disinvestment in Fossil Fuel extraction might have on the health of the University's investments. It has also checked the extent to which the University benefits from financial support from the Fossil Fuel extraction industry.

Members of the Investment Advisory Committee have expressed a range of views. If there is a consensus, it is that disinvestment should be over a lengthy period, and that the University might expect there to be a small reduction in portfolio returns. The working group also considered that disinvestment should be over a lengthy period and that a modest risk to financial returns existed. However, the group heard other evidence that was more encouraging, and it noted that one of the University's two brokers currently places less than 5% of its investment portfolio with the Fossil Fuel industry. Turning to the level of investment by the Fossil Fuel industry in the University, our research funding from the industry is small, being less than 0.2% of the University's research holdings.

The conclusion of the Working Group is that it supports the ethical case for disinvesting from the Fossil Fuel industry, that it recognises this would involve a modest risk to the financial return on the University's investments, and that it believes this risk can be effectively managed by disinvesting over a substantial period of time.

The working group therefore recommends that Court ask the Investment Advisory Committee:

1. **to cap the University's investment in the Fossil Fuel industry such that it will not rise above the current level of 10% of funds invested;**
2. **to reduce this level of investment to 5% by June 2019, and to zero by 2024.**
3. **to require the University's fund managers to identify strategies to mitigate the financial risk associated with this instruction;**
4. **to require the fund managers also to consider investment in green energy, where this is consistent with achieving the financial targets set by the University; and**
5. **to monitor the managers' response to these requirements and to report to Court in 2 years' time.**

DN, 23.6.14

June 2014 minute of Court meeting

CRT/2013/52. Report from the Secretary of Court

CRT/2013/52.1 Socially Responsible Investment Policy – Fossil Fuel

At the February meeting, Court had approved the setting up of a working group to consider representations submitted by the Glasgow University Climate Action Society (GUCAS), via the SRC, for the University to divest from fossil fuel industry companies in accordance with the University's Policy on Socially Responsible Investment (SRIP). The working group had involved two lay members of Court (Graeme Bissett and Murdoch MacLennan), one Senate Assessor (Marie Freel), one SRC representative on Court (Donald Mackay) and the Secretary of Court.

The group had met on 16 May to consider the document provided by GUCAS and to hear representations from four of its members. Since then, the group had contacted the Investment Advisory Committee IAC for its views on potential disinvestment in fossil fuel extractors (oil/gas/coal extraction), which was the area which the GUCAS members who attended the meeting had clarified was the focus of the campaign. Court heard that IAC members had expressed a range of views; if there was a consensus, it was that disinvestment should be over a lengthy period, and that the University might expect there to be a small reduction in portfolio returns.

The working group had itself also considered that disinvestment should be over a lengthy period; and that a modest risk to financial returns existed. The group had however noted that one of the University's two brokers currently placed less than 5% of its investment portfolio with the fossil fuel industry. The level of investment by the fossil fuel industry in the University in terms of research funding and donations from the industry was small. The conclusion of the Working Group had been that it supported the ethical case for disinvesting from the fossil fuel extraction industry, that it recognised this would involve a modest risk to the financial return on the University's investments, and that it believed that this risk could be effectively managed by disinvesting over a substantial period of time. It had made recommendations to Court accordingly.

At the meeting, Court noted from the working group's members that the case for climate change being a fact had been taken as made, that the group had been strongly persuaded by the quality of the arguments presented by the GUCAS, and that for the University to take a lead in the area of disinvestment from the fossil fuel extraction industry would be a positive symbolic step. It would also see the University taking a lead as an early supporter of the proposal, which it was understood was being considered by a number of institutions worldwide. While it had not received formal representations from bodies that were opposed to what GUCAS was suggesting, the group had considered potential downsides, in particular the potential loss of income both from investments and funding, but had concluded that on balance it would recommend progressive disinvestment and that instructions should be given to fund managers to this effect.

In discussion, mixed views were expressed by Court members. Concerns were raised as to whether alternative arguments had been examined as part of the process; Court heard in response to this point that details of University funding from the fossil fuel extraction industry

had been sought and the IAC had been consulted for its views. Reference was made to the terms of the SRIP, namely that *"the key criterion against which specific cases would be considered would be whether the activity complained of and substantiated by the concerned group, was wholly contrary to the University's value systems either as reflected in the Mission Statement or the Strategic Plan or in regard to wider issues of social, environmental and humanitarian concern";* it was questioned whether this criterion could be said to be the case here, for example in the context of the University recently having recently approved a gas-powered Combined Heat & Power system. Against this, reference was made to the University's commitment to carbon reduction via its Carbon Management Plan. It was also confirmed that the terms of the SRIP had indeed been considered by group, and reflected in its recommendation that a phased disinvestment take place, the decision having been taken that the GUCAS proposal did not fit neatly on one side or the other of the criterion, but that environmental damage was nevertheless a key challenge for the current times: it was argued that the idea of not reducing the impact of fossil fuel extraction in this wider global context could indeed be considered as 'wholly contrary' to the University's value systems.

Court heard views that ensuring the maximum returns from investments was vital for funding scholarships. The University's portfolio could be negatively affected by the proposed disinvestment, since few companies had such good yields as the fossil fuel companies in question, and were also riskier investments. It might also be difficult properly to clarify which companies could be classified as extractors. Such companies might also in time take the lead in developing alternatives to fossil fuels. Concerns were also expressed about the effect on University funding, although it was noted that the present level of both philanthropic donations and direct research funding from the industry was small. It was commented that the reverse might in fact apply, that other companies might be positively encouraged to support the University if it disinvested in the fossil fuel industry, since the move could add value to the University's attractiveness to funders.

It was agreed that more information was needed to inform a decision, and that as such the matter should be reviewed further by the working group over the summer, with specific proposals to be presented and discussed further at the October 2014 meeting of Court. In particular, information would be provided to link the GUCAS concerns about investments in the fossil fuel industry to the SRIP criterion of this being 'wholly contrary' to the University's value system. Greater clarity would also be provided on the potential risks and impact on University income, which needed to be quantified as best as possible, and should include consideration of the potential difficulty in accepting funding from fossil fuel extraction companies in the future. Individual Court members were invited to submit details of any other points for consideration by the group.

It was noted that the basic case about climate change being a fact would not be re-considered by the group and would be taken as given.

Policy on Socially Responsible Investment (October 2009)

The University Court is committed to socially responsible investment and will via its Investment Advisory Committee and Pension Scheme Trustees actively encourage its fund managers:

(i) to continue to commit to SRI within their investment policies; and

(ii) to continue to use the Ethical Investment Research Service (EIRIS) (or a similar service) to monitor the behaviour of companies in SRI

When a fund manager does not follow this line, the University should consider whether or not to change the manager at an appropriate and cost-effective point in time.

The one business activity in which the University should continue to instruct its fund managers not to invest is the tobacco industry as such an investment runs entirely counter to the University's direct interests in research.

Fund managers should be asked to supply copies of their voting records in relation to companies where concerns may have been expressed about lack of attention to social, ethical or environmental matters.

Groups from within the University may make representations in respect of an investment or investments held by the University, where those groups have concerns. Representations should be made in writing to the Secretary of Court. Such representations will be considered on the following basis:

1. The key criterion against which specific cases would be considered would be whether the activity complained of and substantiated by the concerned group, was wholly contrary to the University's value systems either as reflected in the Mission Statement or the Strategic Plan or in regard to wider issues of social, environmental and humanitarian concern.

2. Expressions of concern should be related to specific companies whose activities or values appear, on the basis of clear evidence, to be so far removed from the University's core values as to give grounds for serious concern. Cases would only be considered if brought forward by the SRC as the recognised student body, or a recognised trade union, or via the University's committee structure.

3. Cases would be considered by a Court group in the first instance. The group will comprise 2 lay members of Court, a Senate Assessor, an SRC representative from Court and the Secretary of Court. The group would be expected to take into account the current extent of the fund managers' engagement with the company with respect to the concerns raised. It would be for the group to decide whether there were sufficiently strong grounds to warrant engagement with the company through the mechanisms established by the fund managers where this was not already in hand, or to request strengthening of that engagement if already active. The group would ask the Investment Advisory Committee or the Pension Scheme Trustees to communicate with the fund managers about these issues.

4. If a situation arose in which such engagement did not assuage serious concerns raised about a particular company, it might be concluded by the Court on the recommendation of the Court group that it should disinvest in the company. The Investment Advisory Committee or Pension Scheme Trustees would be requested to make the financial consequences of such a decision clear to the group during the course of its deliberations.

The University will publish annually on its website a list of companies and other funds in which investments are held.

An annual report will be made to Court via the Finance Committee in respect of the investment funds.

University of Glasgow

Review of Policy on Socially Responsible Investment

Report of Review Group

Background and Remit

A Court group was established by the Secretary of Court in March 2009, comprising Robin Easton (chair), Susan Ashworth, Susan Dunsmore, Eleanor Gordon and Gavin Lee.

The group's remit was to review the University's current Socially Responsible Investment policy, approved by Court in 2000, and compare it with some of the policies developed in more recent years by other bodies.

The underlying issue to the review was that, other than proscribing investment in tobacco, the University had not been prescriptive and had left decisions on Socially Responsible Investment to its various investment managers. The group was asked to consider whether that approach should continue, or whether the University should be more direct in identifying types of investment which it did not support.

Working Method

The group looked at Ethical policies, Ethical Investment policies or Socially Responsible Investment policies of several Universities, the Co-operative Bank, the Church of England and the Church of Scotland. These provided a cross-section of types of policies, varying in their approach from very detailed and prescriptive to more general. The group was mindful that the businesses of the organisations in question would have different objectives and that the level of invested funds involved varied enormously, from £tens of millions through to £6.5 billion, both of which factors may have affected the content of the policies.

The group also reviewed the Socially Responsible Investment statements of the investment managers appointed by the University for its endowments and by the University of Glasgow Pension Scheme trustees.

The group met with David Ross, lay member of Court and chair of the Investment Advisory Committee which oversees the investment of the University's endowments, and with the University's Director of Finance, Robert Fraser, who is a University of Glasgow Pension Scheme trustee and chair of the Pension Investment Committee.

Findings

Invested Funds

The University has two main funds which hold investments in equities, including shares in companies listed in stock exchanges around the world, and unit trusts, the latter being in

increasing use. The two funds are the University's endowments, where the interests of the University are managed by the Investment Advisory Committee and the University of Glasgow Pension Scheme where the interests of pensioners are looked after by appointed trustees. At April 2009 the funds were valued at £96M and £144M respectively. They are managed by professional fund managers, each fund being split between two different fund managers.

The group noted that there was a difference in the nature of the two funds. While the endowments belong to the University, for the benefit of people and activities 'in-house', the pension fund is held separately from the University, is managed by a group of independent trustees, mainly externally appointed, and is for the benefit of retired staff who have paid into the scheme, or for their dependents. The duties of the Pension Scheme trustees are formal duties relating to a trust fund outwith the University, whereas member of the Investment Advisory Committee would not have the same trustee status. As such, the group's understanding was that a University Socially Responsible Investment policy could not be imposed on the Pension Scheme trustees, but could be recommended. This is relevant in the context of any potential restrictions being agreed in respect of investments.

The group was mindful of the findings of the previous review undertaken in 2000 in respect of trustees' duties. The report from that time referred to the investment policy of the Universities Superannuation Scheme as being an example of the duty of care on the part of trustees to ensure that funds in their care are invested and managed to produce the best possible performance:

(a) Trustees are free to adopt a policy of ethical investment, provided that they treat the financial interests of all classes of scheme members as paramount and their investment polices are consistent with the standards of care and prudence required by law.
(b) Trustees are free to avoid certain kinds of prudent investment which they consider scheme members would regard as objectionable so long as they make equally financially advantageous and prudent investments elsewhere. They may also make 'ethical' investments provided these are otherwise justifiable on investment grounds.
(c) Trustees are not entitled to subordinate the interests of members to ethical or social demands. The financial performance of the fund, consistent with proper diversification and prudence, is paramount.

The duty of care does not allow for personal prejudice or bias to be used in making investment decisions: the group agreed with this as a general principle applying to both funds, but was also of the view that if the activities of an organisation in which investment was proposed were wholly contrary to the aims of the University, then this could be a consideration and reflected in any revised University policy. Nevertheless, the group agreed that the interests of those benefiting from the investments of both funds were vital and that it was very important to recognise the need correctly to balance the benefits to the relevant individuals and institution against any restrictions placed on investments which could lead to poorer financial performance.

Fund managers' policies

With respect to the Socially Responsible Investment statements of the fund managers, the group established that reliance is placed by the Investment Advisory Committee and the Pension Scheme trustees on these statements being adhered to by the managers. Socially Responsible Investment statements generally indicate that fund managers will seek to understand the social, environmental and ethical policies of the companies in which they invest. When evaluating companies for investment, they will consider their social and other policies alongside other factors which they believe will affect the

companies' long-term prospects. They encourage the companies to adopt and pursue socially responsible business practices. Emphasis is placed on good corporate governance. Fund managers are also supplied with client-specific policies.

The group understood that, since 2000, no direct investments had been withdrawn under the fund managers' Socially Responsible Investment statements nor any concerns about companies' practice been drawn to the attention of the Investment Advisory Committee or Pension Scheme trustees.

The group considered that it was reasonable to rely on the fund managers to adhere to the Socially Responsible Investment Statements; a monitoring system would not be practicably possible to implement. In addition, the group noted that regular reports were made to both the Investment Advisory Committee and Pension Scheme trustees in respect of the health of the funds and in respect of governance matters of the companies; therefore below the surface of the Socially Responsible Investment Statements it was the case that fund managers met companies and monitored standards of company governance.

Information on Investments

The group noted that information about the investments made by the fund managers did not appear on the University's website, although details were available if requested.

The group also noted that Court did not currently receive reports on the investment funds in any detail.

Restrictions on investments

At the time of the review in 2000, it had been agreed by Court that tobacco companies were a case where the University would not wish investments to be made: it was known that cigarette smoking was a major cause of cancers, the University was a leading centre in the UK for research against cancers and there was therefore a clear case for the University declining to invest directly in tobacco companies. The group established that Court's wish with regard to this had been followed since 2000 by the fund managers for both funds. The group agreed that this should continue, given the clear conflict between the University's activities and the consumption of tobacco. The group noted that it was possible that as part of pooled funds/unit trusts, which were increasingly used as investment vehicles, there might on occasions be some link to tobacco companies where the details would not be evident to the fund managers, but that this would not involve direct investment in the industry.

The group considered whether the restriction on tobacco industry investment should be widened to include other areas. In this respect, the policies of other organisations referred to above were examined. The group noted that the Co-op Bank's ethical policy related to its lending rather than to investments. Nevertheless, the policy provided useful points for consideration: it would decline to lend to organisations involved in certain activities, e.g. those which departed from the principles of the Universal Declaration on Human Rights; organisations which did not abide by standards for international development (e.g. failed to implement basic labour rights); and businesses whose activities had adverse ecological impacts.

Some policies set upper limits on the level of involvement of companies in certain activities, proscribing 'substantial' involvement in e.g. gambling, alcohol, tobacco, the defence industry, where 'substantially' was defined as a percentage of total company turnover being derived from these sectors. One Church had detailed rules with respect to

the defence industry, with different levels of exclusion applying, with (broadly) a distinction being made between 'non-offensive' or peacekeeping equipment and 'offensive' equipment suppliers.

One University, which permitted representations to be made by groups from within the University about areas of investment they objected to, stated that the key criterion against which specific cases would be considered would be whether the activity was "wholly contrary to the University's values either as reflected in the Mission Statement, the Goals and the Corporate Plan or in regard to wider issues of social, environmental and humanitarian concerns; this could include human rights abuse, discrimination on grounds of race, gender or disability and serious and persistent environmental damage".

The group did not favour a list of proscribed areas, nor options involving percentages. It had concerns about the practicalities of these, particularly with respect to tracking the content of pooled funds/unit trusts, which were increasingly purchased by the managers of both funds. The group agreed that a policy allowing the possibility of excluding areas which were wholly contrary to the aims of the University, using a mechanism permitting representations on specific grounds, could work at a practical level. The needs of funds' beneficiaries would still however have to be considered.

Representations about Investments

The group considered whether interested groups should, formally, be able to make representations to the University regarding its investments. Such representations are provided for in several of the other organisations' policies examined. The group agreed that this should be permitted, but that a clear framework was needed. For example, representations might only be permitted if they related to named companies whose activities were clearly demonstrated to be in serious conflict with the University's core values. Cases might only be considered if made by recognised local trade unions, the recognised student representative body or through a University committee, and a body would need to be identified to consider the cases. Court would need to agree on the appropriate body to receive representations.

Conclusions and Recommendations

The group concludes that the policy agreed in 2000 has been followed but that some expansion of it is needed to reflect the points made above in the Findings section.

The group concludes that restriction on investment in tobacco companies should continue. The University should not at this stage identify further types of investment which it will not support. However, the group also concludes that there should be a mechanism for representations to be made by University of Glasgow-based groups.

The group also considers that more information should be available to the Court and to the wider community about the investments.

The recommendations below should be notified to the Investment Advisory Committee as a requirement and to the Pension Scheme trustees as a recommendation, to be transmitted in both cases to the respective fund managers.

The group's recommendations are:-

1. There is a need for the existing University policy to be augmented; a draft revised statement is attached for consideration;
2. The existing restriction on direct investment in tobacco companies should continue;
3. Decisions on Socially Responsible Investment should continue to be the responsibility of the fund managers, who should be provided with the revised policy;
4. There should exist a right for interested groups to raise concerns, as reflected in the revised policy, within a prescribed framework, if an activity invested in is demonstrably wholly contrary to the value system of the University;
5. As a matter of good practice and openness, and in order to allow for interested groups to raise concerns in line with recommendation 4., details of investments should be published annually on the University's website;
6. There should be regular reports to Court on the investments, via the Finance Committee report, which should include specific reference to the socially responsible investment policy.

Current agreed position

The [2000] Working Group considers that the Court should commit itself formally to "socially responsible investment" and that it should actively encourage its fund managers:

(i) to include a commitment to SRI within their investment policies; and
(ii) to use EIRIS (or a similar service) to monitor the behaviour of companies in SRI

When a fund manager does not follow this line, the University should consider whether or not to change the manager at an appropriate and cost-effective point in time.

More narrowly, the one business activity in which the University should continue to instruct its fund managers not to invest is the tobacco industry as such an investment runs entirely counter to the University's direct interests in research.

Other activities on which concern has been expressed such as aerospace and defence should be dealt with via the SRI polices of the fund managers used by the University.

Fund managers should be asked to supply copies of their voting records in relation to companies where concerns may have been expressed about lack of attention to social, ethical or environmental matters.

Suggested future policy

The Court is committed to "socially responsible investment" and will via its Investment Advisory Committee and Pension Scheme Trustees actively encourage its fund managers:

(i) to continue to commit to SRI within their investment policies; and
(ii) to continue to use the Ethical Investment Research Service (EIRIS) (or a similar service) to monitor the behaviour of companies in SRI

When a fund manager does not follow this line, the University should consider whether or not to change the manager at an appropriate and cost-effective point in time.

The one business activity in which the University should continue to instruct its fund managers not to invest is the tobacco industry as such an investment runs entirely counter to the University's direct interests in research.

Fund managers should be asked to supply copies of their voting records in relation to companies where concerns may have been expressed about lack of attention to social, ethical or environmental matters.

Groups from within the University may make representations in respect of an investment or investments held by the University, where those groups have concerns. Such representations will be considered on the following basis:

1. The key criterion against which specific cases would be considered would be whether the activity complained of and substantiated by the concerned group, was wholly contrary to the University's value systems either as reflected in the Mission Statement or the Strategic Plan or in regard to wider issues of social, environmental and humanitarian concern.

2. Expressions of concern should be related to specific companies whose activities or values appear, on the basis of clear evidence, to be so far removed from the University's core values as to give grounds for serious concern. Cases would only be considered if brought forward by the SRC as the recognised student body, or a recognised trade union, or via the University's committee structure.

3. Cases would be considered by a Court group in the first instance. The group will comprise 2 lay members of Court, a Senate Assessor, an SRC representative from Court and the Secretary of Court. The group would be expected to take into account the current extent of the fund managers' engagement with the company with respect to the concerns raised. It would be for the group to decide whether there were sufficiently strong grounds to warrant engagement with the company through the mechanisms established by the fund managers where this was not already in hand, or to request strengthening of that engagement if already active. The group would ask the Investment Advisory Committee or the Pension Scheme Trustees to communicate with the fund managers about these issues.

4. If a situation arose in which such engagement did not assuage serious concerns raised about a particular company, it might be concluded by the Court on the recommendation of the Court group that it should disinvest in the company. The Investment Advisory Committee or Pension Scheme Trustees would be requested to make the financial consequences of such a decision clear to the group during the course of its deliberations.

The University will publish annually on its website a list of companies and other funds in which investments are held.

An annual report will be made to Court via the Finance Committee in respect of the investment funds.

University of Glasgow

Court

[Draft] Minute of Meeting held on Wednesday 8 October 2014 in the Senate Room

Extract

CRT/2014/5.3 Socially Responsible Investment Policy – Fossil Fuels

In June, Court had discussed a paper from the working group, which had been formed to consider the case for disinvestment from the fossil fuel extraction industry. A range of views had been expressed, and the working group had been asked to consider the matter further and report back, presenting more fully the case for disinvestment, and addressing concerns raised by Court members. A paper had been provided for Court's consideration.

Graeme Bissett explained that the paper reiterated the case for disinvestment in the wider context of the University's taking a responsible approach to climate change and making a commitment to reduce carbon consumption. The recommendation from the group was the University should gradually reduce its investment in the fossil fuel extraction industry; a short period was not considered realistic given that fossil fuels would be a reality for many years. It was also recognised that the position should not be a fixed one and that it should reviewed from time to time, suggested as every 2 years. The group had also been mindful of Court's need to manage the institution's resources prudently and therefore for the need to look in more detail at the financial impact on the University; this included research and philanthropic funding. At the core of the considerations had been the question of whether the terms of the policy had been met, in particular whether the criterion of such investments being 'wholly contrary to the University's value systems either as reflected in the Mission Statement or the Strategic Plan or in regard to wider issues of social, environmental and humanitarian concern'. The group had concluded that if investments continued in fossil fuels, this was not aligned to the University's policy of reducing reliance on fossil fuels: it would be contrary to the University's value systems to take no action on fossil fuel investment.

Accordingly, these various matter having been considered, the revised recommendations to Court, from the group, were:

.1 that the University's direct investment in the fossil fuel extraction industry should be managed in a controlled manner such that the value of such investments does not exceed the current level of 10% of the endowment portfolio for any appreciable time period; and

.2 that the current level of investment should be reduced to zero over the next 10 years, subject to Recommendation 3 and biennial re-evaluation of the financial and other impacts of the divestment policy on the University along with the scope for increased investment in renewable energy sources.

.3 that prior to executing Recommendation 2, a further examination of the financial impact of that Recommendation be conducted through dialogue with the Glasgow University Climate Action Society (GUCAS) and the University's Investment Committee [IAC] to provide assurance to Court as to the limited scale of the prospective financial impact.

In discussion, views were expressed by some members of Court that the approach being recommended was too blunt; that the group had not taken a balanced approach, by only allowing the Climate Action Society to put forward a case; that the Scottish economy and many jobs were underpinned by the industry, from which economy the University benefitted in terms of government HE funding; that steps were already being taken by the University to reduce its carbon emissions; that fundraising might suffer, including in the context of the re-development of the campus; that more detail on which companies would be involved was needed, since many were multi-disciplinary; that the 'wholly contrary' test was not met; and that there might be wider implications in terms of the University's other activities being open to question. A question was raised about whether Court members, as trustees associated with the relevant funds, were legally permitted to take a decision to disinvest as was being proposed, given the duties to beneficiaries. A further comment was made about insufficient financial information having been made available.

It was clarified that the group's focus was on companies whose primary activity was fossil fuel extraction. The University's current investment in these companies was valued at approximately £18M. A comment was noted to the effect that a staged approach was being recommended, and that there were various steps, including consideration by various University committees, where the issue might be revisited if circumstances changed, therefore the approach was a measured one.

Others agreed with the recommendations, including the relatively long-term approach being put forward and the mindfulness towards the planet's future that was being shown. The lead that would be shown if the recommendations were agreed would be a positive step and could benefit the University's reputation, rather than disadvantage the institution. An ethical or principled decision of this nature should not be predicated upon financial considerations. There was not an inconsistency of approach, since the University was taking steps to reduce its carbon emissions, and disinvestment would be wholly in line with diversification away from reliance on fossil fuels.

Following the discussion, the working group's recommendations were approved by a majority of those present and entitled to vote, subject to the condition contained in them with regard to assurances about the financial impact for the University being met, and subject also to advice being sought on whether the decision to disinvest could be made without breaching trustees' fiduciary duties. It was noted that the investment managers would be aware of the activities of companies in the portfolio and would be able to advise on which were primarily engaged in fossil fuel extraction. Liaison by the group with that committee and the GUCAG would be taken forward by the Secretary of Court.

David Anderson, General Council Assessor, recorded a concern that from a governance perspective it was not satisfactory that Court had been asked to consider recommendations in the absence of detail about the full financial impact of disinvestment.

Court would be updated at its next meeting.