Carbon at All Costs

The Fossil Fuel Industry and the Case for Divestment

A submission to Principal Fortier and the McGill Board of Governors' Committee to Advise on Matters of Social Responsibility.

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Acknowledgements

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How to read this document

This brief explains why divestment from the top 200 fossil fuel companies is not only morally necessary, but also feasible and financially prudent. It details why a decision to divest from the 200 fossil fuel companies with the largest carbon reserves would uphold the values of the university, secure its finances, and permit the school to take a leadership role in a necessary global transition away from carbon-intensive energy.

This document aims to:

- Respond directly to the Terms of Reference for McGill's Committee to Advise on Matters of Social Responsibility (CAMSR);
- Provide a comprehensive and well-documented case supporting each major argument for divestment; and
- Allow readers the opportunity to explore the main elements of the argument, through a choice of reading an overview or a more in-depth explanation.

Those seeking a relatively quick overview should examine the Executive Summary (located in a separate document), the Table of Contents, and the Short Answers to Common Questions. Those seeking more detailed information should read the entirety of the relevant section .

Readers are encouraged to prepare themselves psychologically for potentially difficult subject matter, as well as feelings of guilt, anger, and powerlessness. The reader should be aware of natural reactions to difficult material such as avoidance, denial, and dissociation (psychological distance).

Introduction

Context of our resubmission

2014 was the hottest year ever recorded, and as global greenhouse gas (GHG) emissions continue to rise, the impacts of climate change are already harming communities across the world. Meanwhile, the top 200 fossil fuel companies spent over $100 million to prevent action on climate change, and another $674 billion to continue exploring for carbon that humanity cannot afford to extract.[1][2] While the movement to respond to the serious threat of climate change has had considerable growth and many defining moments over the course of this year, opposition to necessary climate action still exists, largely by the same small group of powerful entities which stand to gain short-term financial benefit from continued dependence on fossil fuels.

The overwhelming scientific evidence of climate change has given the fossil fuel industry a choice. Either this industry respect the science at a loss of trillions of dollars, or fight tooth and nail against political, scientific, and popular awareness and action on climate change. Despite the enormous risk and costs already imposed on millions of people, the fossil fuel industry continues to choose the latter option by flooding our political systems with cash, funding questionable science, employing deceptive public relations tactics, and, most importantly, exploring for more fossil fuel reserves while 180+ world governments say we need to keep 80% of current reserves underground. In this context, McGill's leadership is even more imperative and urgent than it was when the community originally called for fossil fuel divestment two years ago .

Divestment campaigns have begun in over 700 institutions worldwide and many of McGill University's peer schools are considering fossil fuel divestment[3] . In fact, over 25 universities and colleges have already committed to partial or full divestment, including Stanford University and Concordia University. Additionally, many cities, counties, religious institutions, foundations, and other groups have divested or committed to divestment, among them the Rockefeller Brothers Fund, heir to the Standard Oil fortune.[4] By leading the way and becoming the first major university in Canada to fully divest from fossil fuels, McGill University can distinguish itself as being a leader on what is arguably the defining issue of the 21st century.

[1] Carbon Tracker Initiative [28]

[2] Center for Responsive Politics, "Industry: Oil & Gas", Open Secrets. https://www.opensecrets.org/lobby/indusclient.php?id=E01&year=2014)

[3] Fossil Free. http://campaigns.gofossilfree.org

[4] Fossil Free, "Divestment Commitments" http://gofossilfree.org/commitments/.

M cGill University's Vision 2020 statement articulates a future where "both people and the planet can flourish." If future generations are to enjoy the same opportunities that current generations possess, they cannot inherit a planet that has been impoverished by runaway 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 both today and in the future. Canada has historically benefitted from the use of fossil fuels, 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.

Specific Calls for Action

As an initial step towards the goal of complete divestment from the 200 worst offenders in the fossil fuel industry, this submission calls for immediate divestment from Royal Dutch Shell and Enbridge. In-depth evidence of specific instances of social injury is provided for these companies. Notably, these corporations should be seen as illustrative of the fossil fuel industry as a whole. A key factor in our selection of these examples is their involvement in the Canadian tar sands, which recent studies find is essentially unburnable in any scenario where international climate goals could be realistically met.

Beyond these two companies, in concert with over 700 other divestment campaigns all over the globe, this brief call s for McGill to divest from any of the top 200 fossil fuel companies which fail to meet the following precise and measurable criteria:

- End exploration for fossil fuels in accordance with the internationally recognized 2 $^\circ$C warming limit;
- Cease attempts to prevent action on climate change through all direct and indirect lobbying and campaign contributions to that effect, and by ending any funding of biased climate change studies;
- Pledge to keep the unburnable portion of their fossil fuel reserves underground; and
- Meet national and international standards for obtaining free prior and informed consent from Indigenous communities on whose land they operate.

Any company who fails to meet any of these four criteria would be committing social injury. By investing in companies that are not only profiting from grave environmental degradation and aggravation of climate change, but also actively working to prevent needed political action, McGill is blatantly contradicting its own values of sustainability.

Understanding these Criteria

The criteria outlined above are consistent with the standards used by governments of the world — including Canada, the United States, the United Kingdom, China, India, Brazil, and the 27 European Union members

— who have agreed that we must avoid raising global temperatures by more than 2 ° C above pre-industrial levels. The activities of all these fossil fuel companies are socially injurious in many ways, but adding insult to injury are their clear efforts to frustrate and undermine the policies and emissions levels necessary to limit global warming to 2 ° C. Although new models suggest even this limit may be too conservative, and should perhaps be lowered ,[5] two degrees celsius is the threshold beyond which the IPCC and numerous governments have agreed that the probability of severe and irreversible climate change becomes "unacceptable."

Based on hundreds of thousands of years of evidence on how the climate responds to greenhouse gases (GHG), scientists can calculate the estimated quantity of fossil fuels humanity can burn while remaining within the accepted 2 ° C increase. To do so we must keep future GHG pollution to no more than 565 billion tonnes (gigatonnes) of carbon dioxide[6] . A t the same time, we know that burning just the world's proven reserves of coal, oil, and natural gas would produce 2,795 gigatonnes of carbon dioxide—nearly five times as much as the acceptable carbon budget[7][8] .

The business plans of fossil fuel companies do not take this reality into account. Instead, they have a clear intention to do everything possible to prevent a new international agreement on climate mitigation and adaptation efforts. 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. Right now, we are adding over 35 gigatonnes of carbon dioxide to the atmosphere each year, and the global quantity of that pollution is rising by 3 percent per year.[9] That means that we are on track to exceed the 565 gigatonne limit within 15 year s.

Regardless of the extent of climate change, it is an important driver of social harm and environmental degradation. Even below the 2 ° C limit, climate change will cause (and is already causing) disastrous impacts in some parts of the world. Corporations that produce fossil fuels bear minimal economic consequences for the emissions that they are responsible for, despite the certainty of climate change and the many forms of harm it will cause. The negative impacts of climate change include agricultural impacts, sea level rise, damage to human health, and more severe extreme weather events, among many others.

Due to the dire impacts of climate change, a transition away from fossil fuels is necessary. A lthough this transition will be lengthy and complex, our world needs the fossil fuel companies to cease their political interference with an already delicate and often painful democratic process. If the meddling of these companies is allowed to continue, the impacts of climate change will be much worse, causing even greater social injury than will be sustained if decisive, immediate and ambitious climate action is taken.

Furthermore, both here in Canada and around the world, many of the communities most heavily impacted by the activity of the fossil fuel industry are frontline Indigenous communities. Extraction projects held on

[5] Hansen, Kharecha, and Sato [95]

[6] For a more detailed explanation that is accessible to non-experts see: McKibben [140]

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

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

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

Indigenous lands not only have damaging impacts on these communities' health and environment, but are also in clear violation of the Indigenous peoples' right to free, prior, and informed consent, as outlined in the UN Declaration on the Rights of Indigenous peoples .[10] The repeated and systematic violation of these rights are an affront on the livelihood and traditional ways of life of Canada's Indigenous peoples.[11]

How divestment by McGill University can make a differenc e

The International Energy Agency expects $37 trillion to be spent on energy supply infrastructure between 2012 and 2035.[12] We must decide whether to spend this money digging ourselves deeper into a pit of fossil fuel dependence, or to direct it toward moving beyond fossil fuels. McGill University can help lead the necessary redirection of investment that will allow humanity to prevent climatic catastrophe, while building a safe and efficient global energy system. 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 continue their damaging operations. This license is increasingly undeserved, as fossil fuel companies drive the world toward dangerous climate change and impose harm on people and ecosystems around the world. The impacts these companies have is not only felt by those they harm today, but will also be felt by future generations who will have to cope with the consequences of climate change.

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 the top 200 fossil fuel companies to keep 80% of their reserves underground (with an estimated loss of $1.8 to 2.7 trillion CAD). Shareholder activism is not a credible strategy for influencing companies worth $4.4 trillion to agree to renounce 40-60% of their value by keeping their reserves underground .[13] Yet government regulation would lead to massive losses for these companies and their shareholders.

Establishment economists such as the Bank of England governor Mark Carney and Canadian economist Jeff Rubin have already warned of the tremendous risk of investing in these companies.[14] In addition to the moral implications favouring divestment, the university can protect itself from the risk that fossil fuel stock values will fall substantially when the "carbon bubble" bursts, by accepting that most remaining fossil fuel reserves are unburnable and beginning to sell its holdings now.

[10] "The United Nations Declaration on the Rights of Indigenous Peoples." United Nations. March 1, 2008.

[11] Anaya, James. "The Situation of Indigenous Peoples in Canada." United Nations Special Rapporteur. July 4, 2014. Accessed February 2, 2015. http://unsr.jamesanaya.org/docs/countries/2014-report-canada-a-hrc-27-52-add-2-en.pdf.

[12] International Energy Agency [116]

[13] The market capitalization of $4.4 trillion CAD comes from this Carbon Tracker report: http://www.carbontracker.org/report/wasted-capital-and-stranded-assets/

[14] Shankleman, Jessica. "Mark Carney: Most Fossil Fuel Reserves Can't Be Burned." The Guardian , October 10, 2014. Accessed February 1, 2015. http://www.theguardian.com/environment/2014/oct/13/mark-carney-fossil-fuel-reserves-burned-carbon-bubble .

HOW DIVESTMENT BY MCGILL UNIVERSITY CAN MAKE A DIFFERENC E

Universities, which collectively have endowments and pension funds worth hundreds of billions of dollars, can play an important role in driving a shift toward cost-effective approaches to reducing greenhouse gas emissions, including energy conservation and renewable energy deployment.[15] The energy sources of the future need to be compatible with a stable climate, a fact that the investment community has not yet widely accepted, but which it will be confronted with increasingly as the severity of climate change becomes more obvious. The economic valuation of fossil fuel companies is based on the outdated assumption that fossil fuel extraction and use can continue without limit. If this is permitted, the global effects will be catastrophic.

By accepting that most remaining fossil fuel reserves are unburnable and selling its holdings before the majority of investors, the university can protect itself from climate change and from the risk that fossil fuel stock values will fall substantially when the "carbon bubble" bursts. University divestment of fossil fuel company shares would demonstrate that forward-thinking investors are sufficiently concerned about climate change to take action, and could prompt other investors to reconsider their own portfolio decisions. These objectives can be achieved while improving the financial health of the university and and while upholding its values.

McGill University can divest all holdings of fossil fuel companies while still maintaining a secure portfolio providing attractive returns. The Board has the opportunity to make the legacy of McGill University's investments be the development and deployment of energy options that are compatible with enduring prosperity for the university and humanity as a whole.

[15]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 (McKinsey & Company [142], 8).

Overview of our Argument

Fossil fuel company actions and the CAMSR Terms of Reference

The Committee to Advise on Matters of Social Responsib i lity (CAMSR) at McGill has a mandate to advise the Board of Governors regarding matters concerning the social responsibility of the University relating to investments. These Terms of Reference allow CAMSR to review investments where "social injury" is alleged to have occurred and then recommend actions. Social injury is defined in these Terms of Reference as

"the grave injurious impact which the activities of a company is found to have on consumers, employees, or other persons, or on the natural environment. Such activities include those which violate, or frustrate the enforcement of rules of domestic or international law intended to protect individuals against deprivation of health, safety, or basic freedoms, or to protect the natural environment."

The activities of the fossil fuel industry meets the definition of social injury in the following two ways:

1. Environmental harm : Activities of these corporations have caused, and continue to cause, grave injurious impact upon the natural environment, including harm to the local environment (such as from extraction sites) and harm through their contribution to anthropogenic climate change and its consequences. This, in turn, contributes to grave impacts upon human populations.

2. Direct harm to individuals and populations: The actions of these companies cause, "grave injurious impact" upon "other persons", both:

3. as a result of human rights abuses

4. as a direct consequence of the environmental harm

We present evidence of such harm including data from scientific studies and reports, consensus expert opinion and Canadian and international legal decisions.

In light of this harm, the authors and supporters of this brief call upon CAMSR to recommend the following actions in response to this harm:

1. Immediately suspend new investments in all fossil fuel companies
2. Divest the holdings in Enbridge, Inc. and Royal Dutch Shell and their subsidiaries within 1 year
3. Set up a Working Group to determine the most appropriate process for divestment of the remaining top 200 fossil fuel companies by fossil fuel reserves in the McGill portfolio, in consultation with the Investment Committee and financial advisor

Point 1: Anthropogenic climate change is settled science

Climate change: a brief summary

The last 10,000 years of human civilization have taken place during a span of relative climatic stability.[1][2]

- Burning coal, oil, and gas produces known quantities of carbon dioxide.[3]
- Before the industrial revolution, the concentration of in the atmosphere was approximately 280 parts per million (ppm).[4][5]
- It has now risen to over 400 ppm, largely because of the burning of fossil fuels .[6][7]
- Humanity is now adding 31.6 billion tonnes of CO 2 to the atmosphere annually, causing the atmospheric concentration to rise at a rate of approximately 2.0 ppm per year.[8][9][10]
- If humanity continues to burn fossil fuels at the present rate, the concentration of in the atmosphere will rise to well over 550 ppm by 2100.[11]
- Adding carbon dioxide to the atmosphere reduces the amount of energy the Earth radiates into space. This causes the planet to warm.[12]
- The International Panel on Climate Change (IPCC) 5th Assessment Report has concluded that "It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century."

[1] 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.

[2] Alley [5] , 4 .

[3] United States Environmental Protection Agency [247] For example, the U.S. Environmental Protection Agency (EPA) lists quantities of produced by burning a barrel of oil, metric tonne of coal, or therm (100,000 British thermal units) of natural gas).

[4] 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.

[5] 5

[6] Scripps Institution of Oceanography [192]

[7] The World Bank [226] .

[8] International Energy Agency [115]

[9] National Oceanic and Atmospheric Administration [151]

[10] Hansen, Kharecha, and Sato [95]

[11] Intergovernmental Panel on Climate Change [108]

[12] 5

- Based on evidence from ice cores, we know that doubling the amount o f CO 2 in the atmosphere causes global temperatures to rise by about 3 ° C.[13]
- Governments around the world, including the government of Canada, have adopted 2 ° C as the threshold beyond which climate change should be considered 'dangerous'.[14][15][16][17][18][19]
- If the world is to avoid crossing the 2 ° C limit, most of the world's remaining fossil fuels must be kept in the ground.[20][21][22][23][24][25]

As depicted in figure5.1 , human activity — especially fossil fuel burning — has already pushed the level of in the atmosphere far outside the range that has existed for hundreds of thousands of years.[26] Burning the world's remaining fossil fuels would put us even further outside the climatic conditions experienced 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, with the recent IPCC 5th Assessment Report con cluding that "It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century."[27] . Figure5.2 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.[28]

Comprehensive and authoritative scientific statements on the key elements of climate change date back to the 1979 U.S. National Academy of Sciences report (the Charney report).[29] 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 Programme to be the leading international body on the scientific, technical,

[13] Rockstrom et al. [184], 473.

[14] The Heads of State, Heads of Government, Ministers, and other heads of delegation present at the United Nations Climate Change Conference 2009 in Copenhagen [222]

[15] Government of Australia Climate Commission [78], 5.

[16] Rockstrom et al. [184], 473.

[17] United Nations Environment Programme [240]

[18] Clarke et al. [35], 151.

[19] Anderson and Bows [8]

[20] International Energy Agency [116]

[21] The Economist [221]

[22] McKibben [140]

[23] 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 [78], 5).

[24] Peters et al. [173]

[25] For a detailed rebuttal of the argument that carbon capture and storage eliminates this necessity, see: .

[26] Changes in the isotopic ratio of atmospheric carbon also allow us to identify the fraction of atmospheric resulting from fossil fuel burning.

[27] Intergovernmental Panel on Climate Change [108]

[28] 5

[29] United States National Academy of Sciences [249]

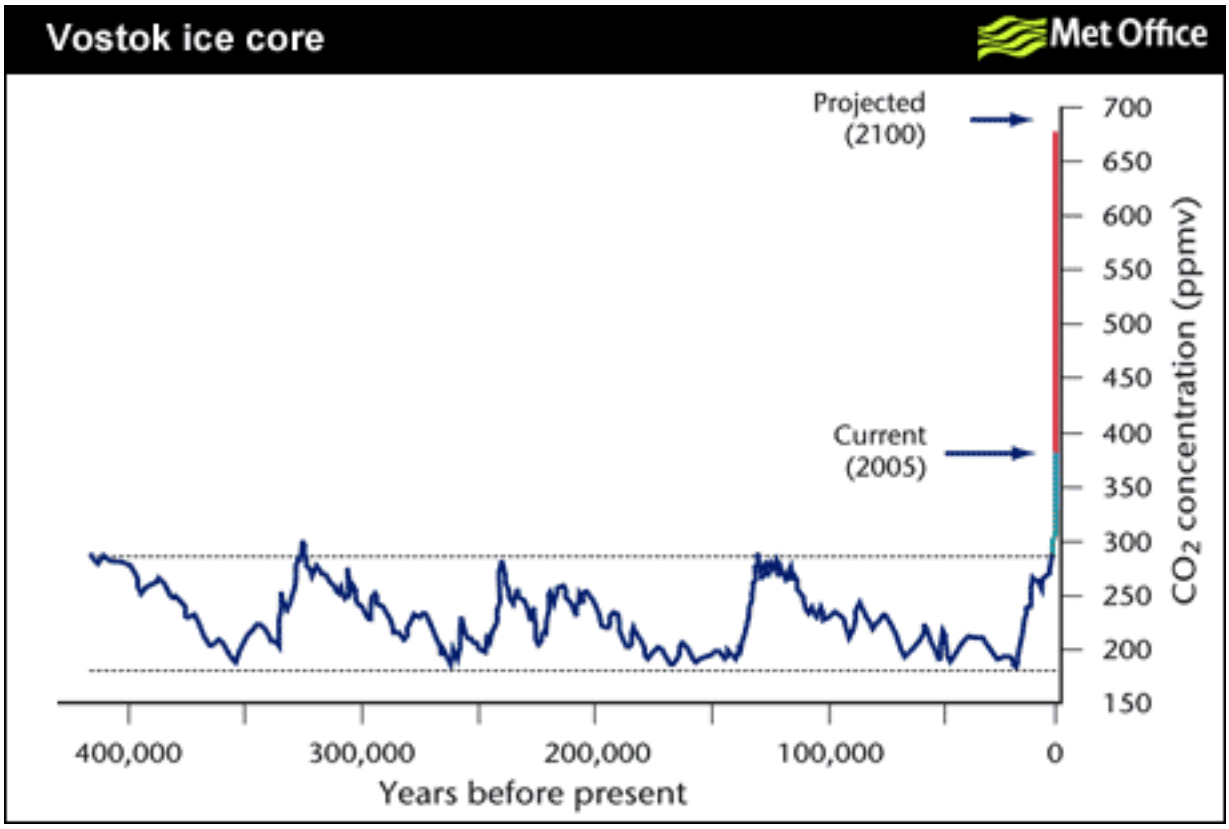

Vostok ice core
Met Office
Projected
(2100)
Current
(2005)
700
650
600
550
500
450
400
350
300
250
200
150
CO_2 concentration (ppmv)
400,000
300,000
200,000
100,000
0
Years before present

Figure 5.1:

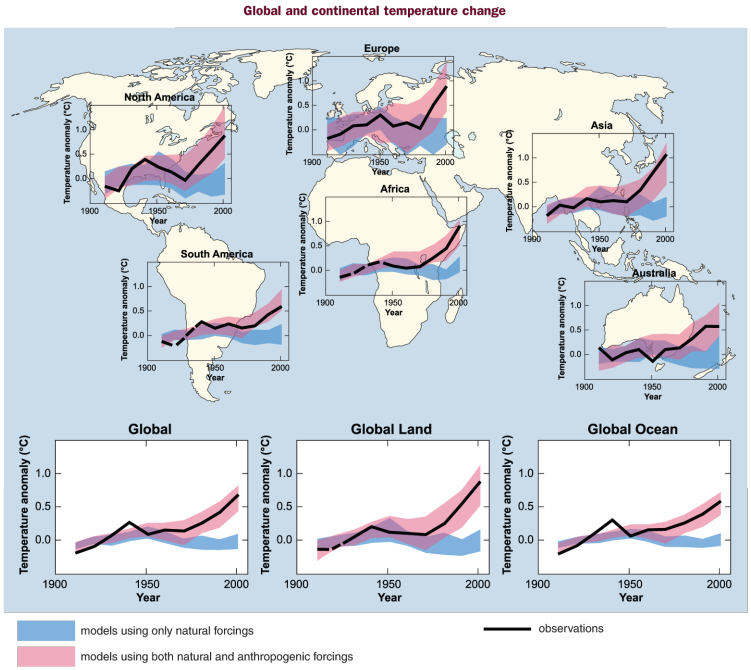


Figure 2.5. *Comparison of observed continental- and global-scale changes in surface temperature with results simulated by climate models using either natural or both natural and anthropogenic forcings. Decadal averages of observations are shown for the period 1906-2005 (black line) plotted against the centre of the decade and relative to the corresponding average for the 1901-1950. Lines are dashed where spatial coverage is less than 50%. Blue shaded bands show the 5 to 95% range for 19 simulations from five climate models using only the natural forcings due to solar activity and volcanoes. Red shaded bands show the 5 to 95% range for 58 simulations from 14 climate models using both natural and anthropogenic forcings. {WGI Figure SPM.4}*

Figure 5.2:

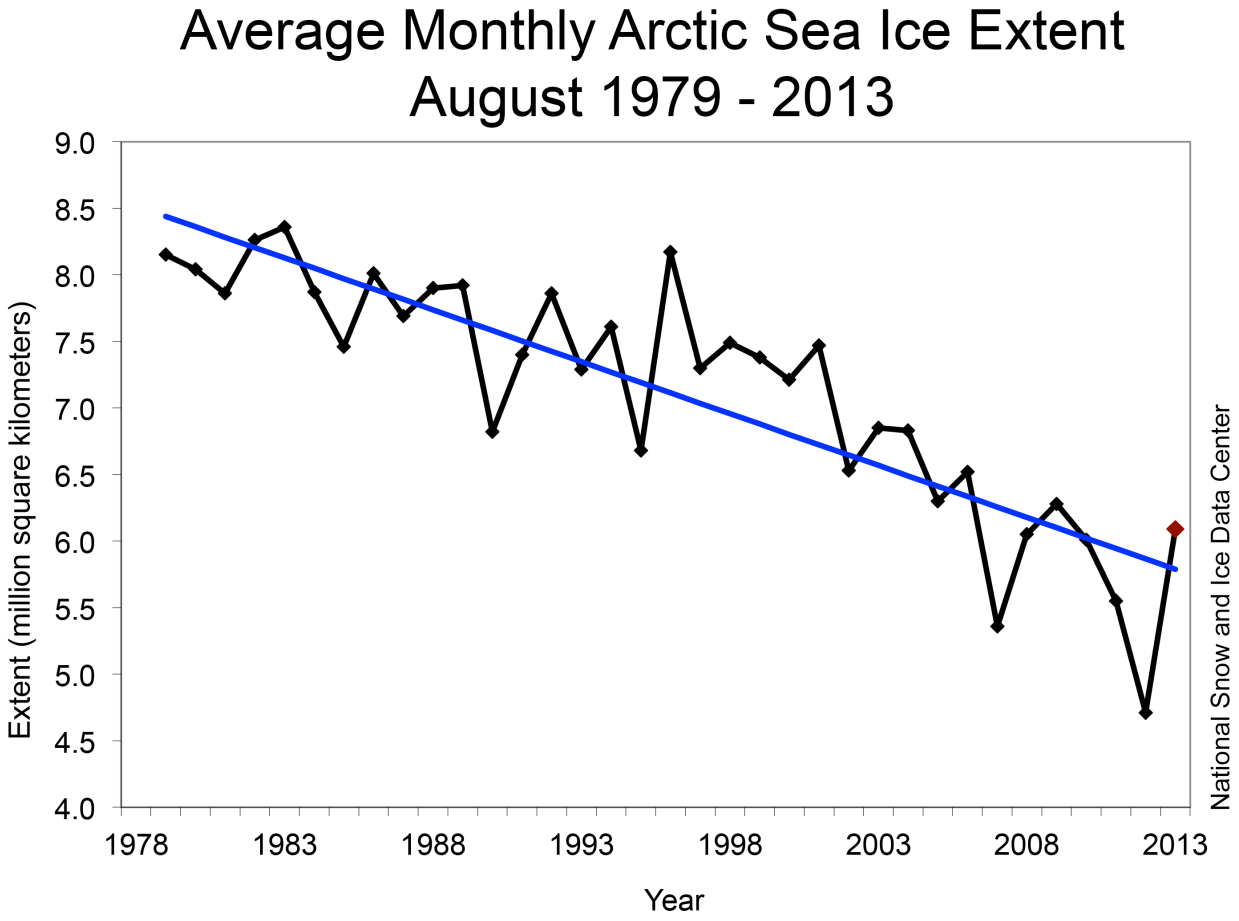

Average Monthly Arctic Sea Ice Extent
August 1979 - 2013
Extent (million square kilometers)
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
1978
1983
1988
1993
1998
2003
2008
2013
Year
National Snow and Ice Data Center

Figure 5.3:

and socioeconomic assessment of climate change. The five major reports of the IPCC in 1990, 1995, 2001, 2007 and 2014 have confirmed the basic conclusions of the Charney report, and elaborated considerably upon the causes and consequences of climate change..[30][31][32][33] In May 2009, the national science academies of the G8 countries plus Brazil, China, South Africa, and India released a remarkable joint statement.[34] The statement explains that: "The need for urgent action to address climate change is now indisputable. For example, limiting global warming to 2°C 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 echoed in recent research, including a 2013 article in Nature Climate Change that emphasized how:"[a] shift to a 2°C pathway requires immediate significant and sustained global mitigation".[35][36]

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 them either take no position on climate change or endorse the consensus position.[37] She concludes:

This analysis shows that scientists 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 discord among climate scientists, but that impression is incorrect.[38]

Oreskes' 2010 book Merchants of Doubt elaborates 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.[39][40] 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

[30] Intergovernmental Panel on Climate Change [109]
[31] Intergovernmental Panel on Climate Change [111]
[32] Intergovernmental Panel on Climate Change [112]
[33] 5
[34] Academia 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 [1]
[35] Peters et al. [173], 1.
[36] Meinshausen et al. [143]
[37] Oreskes [166], 1686.
[38] Oreskes [166], 1686.
[39] Oreskes and Conway [167]
[40] Hoggan and Littlemore [103]

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".[41] More recently, a study examined 11,944 climate-related abstracts from 1991 to 2011 and concluded that: "[a]mong abstracts expressing a position on AGW, 97.1 percent endorsed the consensus position that humans are causing global warming".[42]

Mitigating climate change is necessary in 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 ° C of climate change, substantial damage is expected to be imposed on the global economy. The 2006 Stern Review on the economics of climate change concluded that under a business-as-usual scenario, there is "at least a 50 percent risk of exceeding 5°C global average temperature change" and that "[s]uch 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".[43] Such an outcome threatens the growth prospects of the endowment and pension funds of McGill University. 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 university trustees have 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 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.[44]

The emergence of a strong academic consensus about the key features 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 the university decided to divest from South Africa, it determined that a convincing body of evidence supporting that choice had 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 Canada and McGill University.

[41] Anderegg et al. [7], 1.

[42] Cook et al. [38]

[43] Stern [206] See long executive summary at: [http://www.hm-treasury.gov.uk/d/Executive_Summary.pdf](http://www.google.com/url?q=http%3A
treasury.gov.uk%2Fd%2FExecutive_Summary.pdf&sa=D&sntz=1&usg=AFQjCNEBLaqPguw2jnChzk-5i3wWv-VjdQ

[44] McKibben [141]

Point 2: Climate change is a "grave injurious impact"

Social injuries caused by climate change

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 further social injury through:

1. Impacts on agriculture
2. Decreased food insecurity
3. The inundation of coastal areas
4. Storms, droughts, and other extreme weather
5. Wildfires
6. Increased risks to human health
7. Ecosystem collapse
8. Threats to First Nations groups and indigenous cultures
9. Threats to the infrastructure of cities, including M ontreal
10. The threat of abrupt and non-linear adverse climate impacts, arising from positive feedback effects and important thresholds in the climate system
11. Security implications

In their 2007 report, the IPCC included a table (shown in figure**??**) that summarized how various forms of injury associated with climate change can be expected to worsen as the amount of warming increases.

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".[1][2] 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

[1] United Nations Development Programme [238], 34.
[2] The World Bank [227]

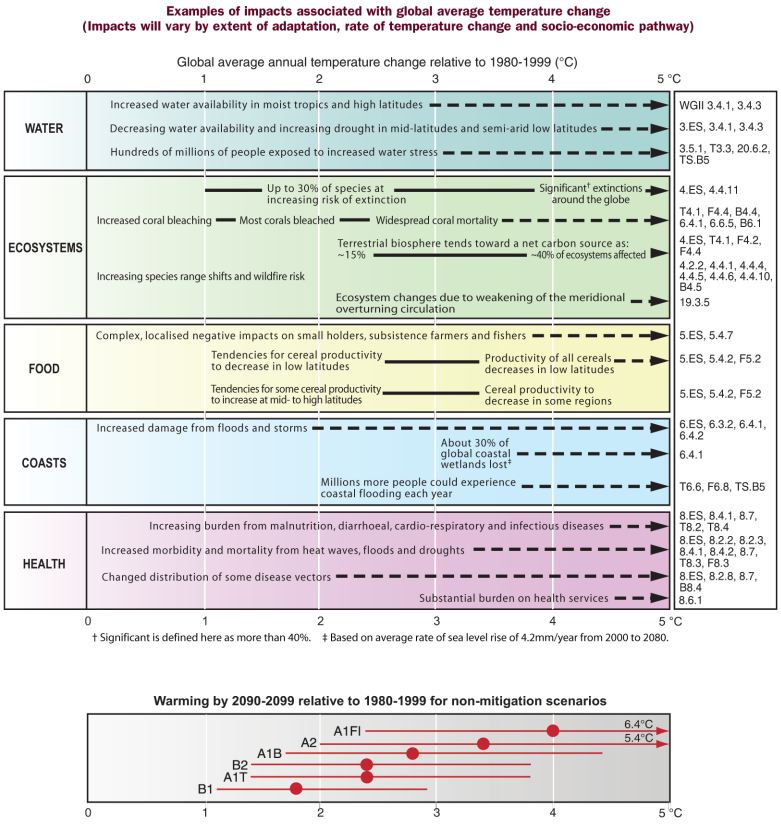


Figure 3.6. *Examples of impacts associated with global average temperature change.* ***Upper panel:*** *Illustrative examples of global impacts projected for climate changes (and sea level and atmospheric CO_2 where relevant) associated with different amounts of increase in global average surface temperature in the 21st century. The black lines link impacts; broken-line arrows indicate impacts continuing with increasing temperature. Entries are placed so that the left-hand side of text indicates the approximate level of warming that is associated with the onset of a given impact. Quantitative entries for water scarcity and flooding represent the additional impacts of climate change relative to the conditions projected across the range of SRES scenarios A1FI, A2, B1 and B2. Adaptation to climate change is not included in these estimations. Confidence levels for all statements are* high. *The upper right panel gives the WG II references for the statements made in the upper left panel.* **Lower panel:** Dots and bars indicate the best estimate and* likely *ranges of warming assessed for the six SRES marker scenarios for 2090-2099 relative to 1980-1999. {WGI Figure SPM.5, 10.7; WGII Figure SPM.2; WGIII Table TS.2, Table 3.10}*

*Where ES = Executive Summary, T = Table, B = Box and F = Figure. Thus B4.5 indicates Box 4.5 in Chapter 4 and 3.5.1 indicates Section 3.5.1 in Chapter 3.

Figure 6.1:

and ecosystems are increasing 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".[3] 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".[4]

According to the Quebec government's 2012 Climate Change Action Plan document, "Global warming is also already a reality in Québec. Average annual temperatures in southern Québec increased by 0.3°C to 1.5°C between 1960 and 2008. Snow showers increased in northern Québec but decreased in the south (MDDEP, 2012). In the longer term, Québec's climate is expected to grow warmer throughout its territory, especially during the winter. Accordingly, by 2050, winter temperatures could rise by 3.8°C in southern Québec and 6.5°C in the north (Ouranos, 2010)... . Some anticipated impacts on Québec in the coming decades with high human, ecological and economic costs:

- the increased frequency and intensity of extreme weather events in the south (flooding, heavy rain, drought), which will compromise public safety, the security of infrastructure and endanger crops;
- the gradual disappearance of annual sea ice in the Arctic, which will affect the ways of life of the Aboriginal peoples and ecosystems;
- accelerated melting of permafrost in the Arctic, which will lead to the instability of buildings and infrastructure such as roads and runways;
- epidemics of pests and forest fires, which will threaten public safety and cause losses for the logging industry;
- extreme low water levels in the St. Lawrence Seaway, which will hamper navigation and put at risk the availability of drinking water and water quality;
- a shorter snow season, which will curtail the activities of the Québec winter sports industry;
- an increase in the distribution range of human disease vectors e.g. Lyme disease."[5]

In 2011, the National Roundtable on the Environment and the Economy (NRTEE) concluded that: "[c]limate change will be expensive for Canada and Canadians. Increasing greenhouse gas emissions worldwide will exert a growing economic impact on our own country, exacting a rising price from Canadians as climate change impacts occur here at home".[6] They also concluded that: "Global mitigation leading to a low climate change future reduces costs to Canada in the long term."[7] The NRTEE highlighted how Canada and the

[3]United Nations Development Programme [238], 87.

[4]Global Humanitarian Forum [73], 1.

[5]http://www.mddelcc.gouv.qc.ca/changements/plan_action/pacc2020-en.pdf The report then named a few benefits that pale in comparison to the projected risks, e.g. increased tourism.

[6]National Round Table on the Environment and the Economy [155], 15.

[7]National Round Table on the Environment and the Economy [155] , 16.

rest of the world must choose between two futures: one in which action is taken (necessarily diminishing the profits and stockmarket value of fossil fuel companies) and another in which the world suffers the unmitigated consequences of climate change:

Examining long-term economic costs of climate change to Canada raises the spectre of two futures: one where the world acts — and keeps global warming to 2°C by 2050 as world leaders have pledged — and one where it doesn't and climate change impacts grow and accelerate beyond targets. At slightly under 2°C of global warming, the economic costs of climate change to Canada in 2050 would be between $21 billion and $43 billion with no adaptive action taken; costs could be at the lower end of range if economic growth slowed as part of domestic mitigation or for other reasons. If the world acts to limit warming to 2°C, future costs could stabilize around this 2050 level since emissions growth would have been dampened and plateaued to reach this new global reality.[8]

A 2012 NRTEE report identifies ice, snow and sea; ecosystems; water resources; human health; communities and infrastructure; resource industries; service industries; and security and trade as categories in which climate change is expected to have adverse impacts in Canada.[9]

In a briefing note prepared for former Minister of the Environment Peter Kent and subsequently released through an access to information request, officials at Environment Canada argued that: "Climate change is the most serious environmental issue facing the world today and carries with it significant impacts on human health and safety, the economy, natural resources, and ecosystems in Canada and throughout the world".[10]

Canada is causing a disproportionate share of damage to the climate, both relative to its population and relative to its share of the global economy. Furthermore, because of the enormous quantity of carbon embedded in the oil sands, Canada has the potential to single-handedly cause substantial damage to the global climate.[11]

McGill University uses the Yale University concept of social injury when responding to any petition regarding divestment.[12] Specifically, the policy defines social injury as:

Social injury is the injurious impact which the activities of a company are found to have on consumers, employees, or other persons, particularly including activities which violate, or frustrate the enforcement of, rules of domestic or international law intended to protect individuals against deprivation or health, safety,

[8]National Round Table on the Environment and the Economy [155] , 18.
[9]National Round Table on the Environment and the Economy [153], 41.
[10]De Souza [45]
[11]

1. Also, see: Carrington, Damian. "Leave Fossil Fuels Buried to Prevent Climate Change, Study Urges." The Guardian January 7,

2015. http://www.theguardian.com/environment/2015/jan/07/much-worlds-fossil-fuel-reserve-must-stay-buried-prevent-climate-change-study-says

[12]Simon, Powers, and Gunnemann [199]

or basic freedoms; for purposes of this Policy, social injury shall not consist of doing business with other companies which are themselves engaged in socially injurious activities.

Climate change falls within this definition. The rest of this section lists many injurious impacts fossil fuel companies are having on consumers, employees, and other persons. It also describes ways in which the behaviour of these companies has frustrated domestic and international law and how the harm being caused is inherent to the primary business of fossil fuel companies. Each subsection elaborates on the forms of social injury associated with climate change and provides empirical evidence of the observed adverse impacts and predicted future risks from climate change.

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.[13] 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".[14] A 2013 study in Nature Climate Change determined that "food price spikes may increase in prevalence in future years".[15] ,[16][17] A report from the International Food Policy Research Institute (IFPRI) found that: "agriculture and human well-being will be negatively affected by climate change".[18] 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 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.[19][20]

Changes in clim ate that will affect Canadian agricultural production include events such as heat waves and droughts, infestation of pests, and severe storms. Climate change is also expected to do between $2 billion

[13] 5 Examples of some projected regional impacts. https://www.ipcc.ch/publications_and_data/ar4/syr/en/spms3.html.
[14] United Nations Development Programme [238], 6.
[15] Iizumi et al. [105], 1.
[16] Intergovernmental Panel on Climate Change [110]
[17] Funk and Brown [68], 271-289.
[18] Nelson et al. [159] , vii.
[19] Nelson et al. [159] , vii.
[20] Wheeler and Braun [265]

and $7 billion in damage to Canada's timber industry by 2050, "through changes in pests, fires, and forest growth".[21]

Studies exploring economic approaches to dealing with climate change show that adaptation can help alleviate risks to Canada's agricultural sector.[22] However, extreme weather events, which are predicted to occur with increasing frequency as global temperatures rise, are significant drivers of yield and impact changes and can therefore disrupt adaptation practices and threaten the health and prosperity of agricultural systems.[23] Extreme weather events may prove more severe than anticipated by adaptation strategies as implemented to date.[24]

The 2012-2014 drought in the United States provides a glimpse of what may become increasingly routine in a world altered by climate change. Beginning in the spring of 2012, the drought originally affected areas along the plains and western mid-west regions of the country. As the drought continued, the federal government declared most of the central and southern U.S. wheat belt a natural disaster area. By July, the drought had reached such extreme conditions that officials in north-central Oklahoma declared a state of emergency on account of record-low reservoir conditions. Furthermore, the U.S Department of Agriculture granted eligibility for low-interest emergency loans to wheat growers in four major wheat-growing states: Kansas, Colorado, Oklahoma, and Texas. In January 2015, experts from the National Oceanic and Atmospheric Administration's (NOAA) Climate Prediction Center observed that long-term drought has persisted in California, Nevada and most of the Great Basin and Southwest. Coverage of abnormal dryness has also increased in the state of Hawaii. It is predicted that drought will persist in the eastern Dakotas and expand to the Tennessee Valley.[25] Martin Hoerling, a research meteorologist at NOAA, explains that: "[c]limate change is likely prolonging the duration and severity of naturally occurring drought in the Southwest" and that both reduced rainfall and higher temperatures may contribute to future droughts.[26] Moreover, less-than-average snow accumulation in surrounding areas, including the central and southern Rockies, results in a decrease of water flowing from streams and rivers to reservoirs, which adds to concerns about the potential for the drought to increase in scope.

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 in the atmosphere.[27][28][29] 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".[30] Canada has experienced

[21] National Round Table on the Environment and the Economy [155] , 16.
[22] Amiraslany [6]
[23] Isik and Devadoss [119]
[24] See: Malcolm et al. [134].
[25] National Oceanic and Atmospheric Administration [151]
[26] Koch [125]
[27] Coumou and Robinson [40]
[28] ScienceDaily [191]
[29] Tollefson [231]
[30] 5 See: Synthesis report, Table SPM.2. Examples of some projected regional impacts. https://www.ipcc.ch/publications_and_

extreme heat and drought events in its recent history. For instance, six wide-ranging and severe droughts took place over southern Ontario between 1936 and 1998. Two droughts, one in 1988 and another in 1998, were both consistent with predictions in climate change scenarios for the Great Lakes region.[31] A n article entitled "Climate Change and Canada's Forests" by the Sustainable Forest Management Network of Canada has stated that "longer droughts and higher temperatures resulting from climate change may create a tipping point whereby fires become unmanageable in some years" (2009). In their latest assessment report, the IPCC concluded that "[c]limate change is expected to exacerbate current stresses on water resources from population growth and economic and land-use change, including urbanisation" and that areas "where more than one-sixth of the world population currently lives" are expected to experience "[r]educ[ed] water availability, hydropower potential, and changing seasonality of flows in regions supplied by meltwater from major mountain ranges".[32] They also concluded that: "[t]he negative impacts of climate change on freshwater systems outweigh its benefits (high confidence)".[33]

Climate change is likely to cause a larger fraction of winter precipitation in North America to fall as rain, rather than snow. This threatens hydroelectric power production, since reservoirs will be filled to capacity during winter but unable to rely upon melting snowpack to for replenishment during the summer months. A 2012 study published in Hydrology and Earth System Sciences projects that climate change will cut snow water storage in the Oregon watershed by 56 percent.[34][35] A study published in Water Resources Research identified a fifty percent chance that the Colorado River system will deplete all of its reservoir storage by 2050.[36][37] This river system powers dams with over 24,000 megawatts of electrical output.

In a report prepared for the U.S. Federal Emergency Management Agency, AECOM estimated that the portion of the U.S. at risk from flooding will increase by 45 percent by 2100, with 70 percent of that increase attributable to climate change.[38][39] As reported by the U.S. EPA: "[m]ore extreme temperature and precipitation can prevent crops from growing. Extreme events, especially floods and droughts, can harm crops and reduce yields".[40]

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.[41] 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-

data/ar4/syr/en/spms3.html) .

[31] Koshida et al. [127]

[32] 5, 49.

[33] 5, 49.

[34] Sproles et al. [203]

[35] ScienceDaily [191]

[36] ScienceDaily [189]

[37] The Economist [219]

[38] AECOM [3]

[39] Sheppard and West [196]

[40] United States Environmental Protection Agency [247]

[41] Nelson et al. [160], 85.

2050 future".[42] 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 through reducing GHG emissions is essential to the long-term health and prosperity of the agricultural sector in Canada.

Climate change worsens food insecurity

A large portion of humanity already lives "on the edge" in terms of access to food; the Food and Agriculture Organization of the United Nations estimates that about one-ninth of humanity goes to bed hungry every night.[43] Every day, it has been estimated that 10 000 humans in Africa alone "needlessly and tragically" die of preventable causes (to place this number in context, around 3 000 persons died in the September 2011 attacks).[44] These numbers, one must note, are for the most part pre-climate change figures.

Climate change will not only challenge humanity overall, but also affects parts of humanity before others. In particular, Africa, Mexico, and South Asia will be hardest-hit by increasing tropical storm and climatic extreme impacts on agricultural food production and human dwellings.[45] To knowingly take financial advantage from companies that are actively causing these tragedies is not in line with McGill's values.

Solely as an example, a recent drought in Guatemala (summer 2014) attributed to climate change caused a loss of 80% of the staple (maize) harvest for the year and left 500 000 children under 5 at risk of acute malnutrition.[46] In a country with a national chronic child malnutrition rate of 49.8%, the implications of increasing climate change for those already living in hunger will be devastating.[47]

The inundation of coastal areas

Across Canada, coastal communities, forests, agriculture, and fisheries are increasingly at risk from climate change. In the Natural Resources Canada report Climate Change Impacts and Adaptation: A Canadian Perspective "sea level rise, resulting from thermal expansion of ocean waters and increased melting of glaciers and ice caps" is identified as "the main issue for marine regions".[48] The report explains that: "[o]verall, more than 7000 kilometres of Canada's coastline are considered highly sensitive to future sea level rise" and that "climate change [is] expected to lead to a suite of biophysical and socio-economic impacts" including coastal inundation, increased coastal erosion, saltwater intrusion into freshwater aquifers, reduced sea-ice cover,

[42] Nelson et al. [160], xxi.

[43] The State of Food Insecurity in the World Food and Agriculture Organization of the United Nations 2014.

[44] Sachs, Jeffrey. The End of Poverty: Economic Possibilities for Our Time : Penguin, 2006.

[45] World Bank. 2012. Turn down the heat : why a 4°C warmer world must be avoided . Washington DC : World Bank. http://documents.worldbank.org/curated/en/2012/11/17097815/turn-down-heat-4%C2%B0c-warmer-world-must-avoided

[46] Andrea Orozco and Carlos Alvarez. "Peligran 500 Mil Niños Por Sequía Prolongada." Prensa Libre , August 26, 2014 http://www.prensalibre.com/noticias/comunitario/Guatemala-decreta-Estado_de_Calamidad-16-departamentos-sequia_0_1199880163.html

[47] "Guatemala - Overview", World Food Programme https://www.wfp.org/countries/guatemala/overview.)

[48] Lemmen and Warren [130], xvi.

higher storm-surge flooding, higher sea surface temperatures, loss of coastal habitat, damage to coastal infrastructure, increased property loss, increased risk of disease, increased flood risks and potential loss of life, and loss of cultural resources and values."[49] In 2011, the NRTEE projected that "[t]he costs of flooding from climate change could be between $1 billion and $8 billion per year by the 2050s".[50]

A closer look at the potential impacts of changing temperatures to the economic stability of Canada's Atlantic provinces illustrates some of these risks in more detail. The federal government report From Impacts to Adaptation: Canada in a Changing Climate 2007 provides a detailed analysis of both current and projected effects of climate change to different areas in Canada, including an extensive discussion on effects specific to the Maritimes region.[51] The study projects major climatic changes in the region: "By 2050, there would be a 2 to 4 °C increase in summer temperature... Future warming of 1.5 to 6 °C during winter can be anticipated".[52] The study also concludes that: "Rising sea level will result in flooding of higher, previously immune areas... and more frequent flooding of low-lying areas".

These effects interact to have major economic and environmental consequences for the Maritime provinces. There is general consensus amongst fisheries scientists that the changing climate is going to significantly impact the Canadian fishing industry. According to a report from Natural Resources Canada "[c]limate change is expected to have significant impacts on fish populations and sustainable harvests".[53] These changes include impacts on Pacific and Atlantic fisheries, along with changes in arctic marine ecosystems and in freshwater fisheries.

The harvesting of wild fish and shellfish, or the raising of these same species in anchored cages, is a major business in many Maritime coastal communities. However, warmer water temperatures could lead to the migration of various fish species to other areas. Similarly, increased land erosion causes greater amounts of sediment to fall into surrounding waters, which can disrupt the feeding and breeding patterns of many species of fish.

Many Maritime coastal communities such as those along the Bay of Fundy are also at risk owing to the melting ice sheets, glaciers, and ice caps that are causing the steady and continuous rising of sea levels across the globe.[54] Concurrent with rising sea levels, the land around the Bay of Fundy is subsiding by almost a foot every 100 years. Taken together, these two effects could result in the rise of sea level along the Fundy coast of almost two feet by the end of the century. This rise could have a devastating effect on many local coastal areas. The increase in coastal erosion caused by rising sea levels will affect sensitive regions along the bay, including vulnerable areas in the northern edges as well as the large low-lying sections of the coast that are already well below sea level and that accommodate roads, railways, businesses, and residential areas. Moreover, the threat of more frequent severe storms poses risks to lands and buildings guarded

[49] Lemmen and Warren [130], xvii.
[50] National Round Table on the Environment and the Economy [155], 16.
[51] Natural Resources Canada [157]
[52] Natural Resources Canada [157], 131.
[53] Natural Resources Canada [156], xv.
[54] Percy [172]

by the many dykes along the coast, since these structures could prolong flooding by preventing seawater drainage in the increasingly likely case of extreme weather or heavy rainfall events. Taken together, threats to natural resources, increased frequency of extreme weather events, the acceleration of coastal erosion, and the threats to safety and stability of infrastructure because of rising sea levels could have unprecedented adverse consequences for Maritime communities.

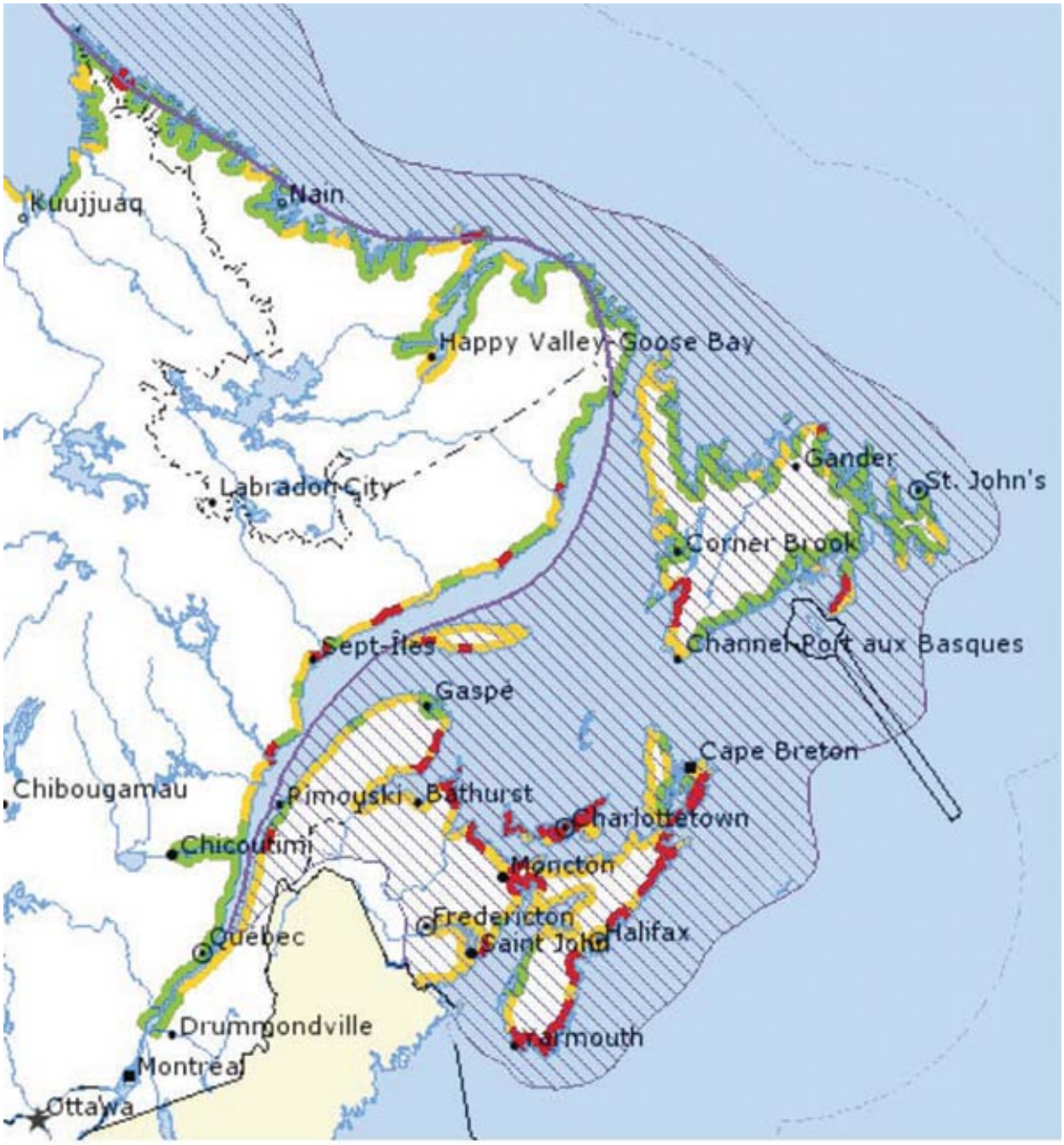
From Vancouver to Halifax, communities across Canada face significant risks from sea-level rise and accompanying impacts. A 2013 study published in Nature Climate Change projects that global flood losses will increase to over US$1 trillion in 2050, unless present levels of protection are upgraded.[55][56][57] The study found Vancouver to be the most vulnerable city in Canada, and the 11th most vulnerable worldwide, with an estimated 100 year exposure of over US$33 billion.[58] In North Vancouver, concern about sea level rise has prompted the city council to raise the minimum height above sea level for new construction from 4.5 to 5.2 metres. This change has added $5 million to the cost of a single new development — 800 new strata units being built along the waterfront.[59]

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.[60] Since 2009, the U.S. Army Corps of Engineers has been incorporating sea level rise into all civil-works programs.[61] 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".[62] In China, 80 million people live in low-lying areas and are vulnerable to climate change-driven increases in sea level and storm surge.[63]

In the long-term, unmitigated climate change risks are causing Greenland and the West Antarctic ice sheets (WAIS) to melt.[64][65][66] 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".[67] 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

[55] Hallegatte et al. [93]
[56] Moore [146]
[57] The Canadian Press [213]
[58] Hallegatte et al. [93], 2.
[59] Richter [183]
[60] The Economist [221]
[61] United States Army Corps of Engineers [244]
[62] Broward County, Miami-Dade County, Monroe County, and Palm Beach County [20]
[63] The Economist [221], 19.
[64] Goelzer et al. [74]
[65] ScienceDaily [191]
[66] Nghiem et al. [162]
[67]

2. See: "Deglaciation of West Antarctic and Greenland ice sheets" https://www.ipcc.ch/publications_and_data/ar4/wg2/en/ch19s19-3-5-2.html


Kuujjuaq
Nain
Happy Valley-Goose Bay
Labrador City
Gander
St. John's
Corner Brook
Channel-Port aux Basques
Sept-Îles
Gaspé
Cape Breton
Chibougamau
Rimouski
Bathurst
Charlottetown
Chicoutimi
Moncton
Fredericton
Saint John
Halifax
Québec
Drummondville
Yarmouth
Montréal
Ottawa
Delineation Between Submerging of Coasts
Line delineating present-day submergence from emergence
Present-day Submerging of Coasts
Present day submerging areas
Coastal Sensitivity to Sea-level Rise
Low (0-4.9)
Moderate (5.0 - 14.9)
High (15 and up)
Capitals (Canada)
National
Provincial and Territorial
Populated Places
1 - 4999
5 000 - 49 999
50 000 - 99 999
100 000 and greater
Regions outside Canada
International Boundaries
EEZ (200 mile)
Canada / Kalaallit Nunaat dividing line
International
Provincial and Territorial Boundaries
Provincial / Territorial
Drainage
Coastline / River / Lake shoreline
Water areas

the Proceedings of the National Academy of Sciences , concluded that for each 1 ° C of temperature increase globally, sea levels may rise by 2.3 metres.[68][69] 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.[70]

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".[71] As with many other climate impacts, the faster sea level rise happens the more costly and disruptive it will be.

Storms, droughts, and other extreme weather

The Earth's changing climate has led to a n o table rise in the number of great natural catastrophes that are driven by climate-related events over the past 25 years.[72] Over the past 10 years, the world ha s experienced approximately 785 natural catastrophes per year .[73] During 2010 alone, a total of 950 natural catastrophes took place, nine-tenths of which were weather-related events such floods, hurricanes and storms.[74] Climate change is likely responsible, at least in part, for the rising frequency and severity of extreme weather events, since warmer temperatures tend to produce more violent weather patterns.[75][76] 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".[77]

The Fourth Assessment Report of the IPCC (2007) asserts that changes in the frequency and intensity

[68] Levermann et al. [132]
[69] Reuters [182]
[70]

3. See: "Projected climate change and its impacts" https://www.ipcc.ch/publications_and_data/ar4/syr/en/spms3.html

[71] O'Leary et al. [164], 1.
[72] 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.
[73] Munich RE. Overall picture of natural catastrophes in 2010 - Very severe earthquakes and many severe weather events. 2011. http://www.munichre.com/en/media-relations/publications/press-releases/2011/2011-01-03-press-release/index.html
[74] Munich RE [149]
[75]

4. This information is not discussed in the IPCC 201 4 report.

[76] Peterson et al. [174]
[77] Environment Canada [54]

of extreme climate events will occur in the future and are very likely to challenge human and natural systems to a much greater extent than natural changes in weather conditions . They predict an increase in hurricanes[78][79][80] and other extreme events including droughts, heat waves, and floods.[81][82] The IPCC describes risks of extreme weather events as one of five special 'reasons for concern' about climate change.[83] On hurricanes, the IPCC explains: "Globally, estimates of the potential destructiveness of hurricanes show a substantial upward trend since the mid-1970s, with a trend towards longer storm duration and greater storm intensity, and the activity is strongly correlated with tropical sea surface temperature".[84] This accords with the basic science of hurricanes, which are driven by the latent heat in water vapour and gain strength from travelling over warmer water.

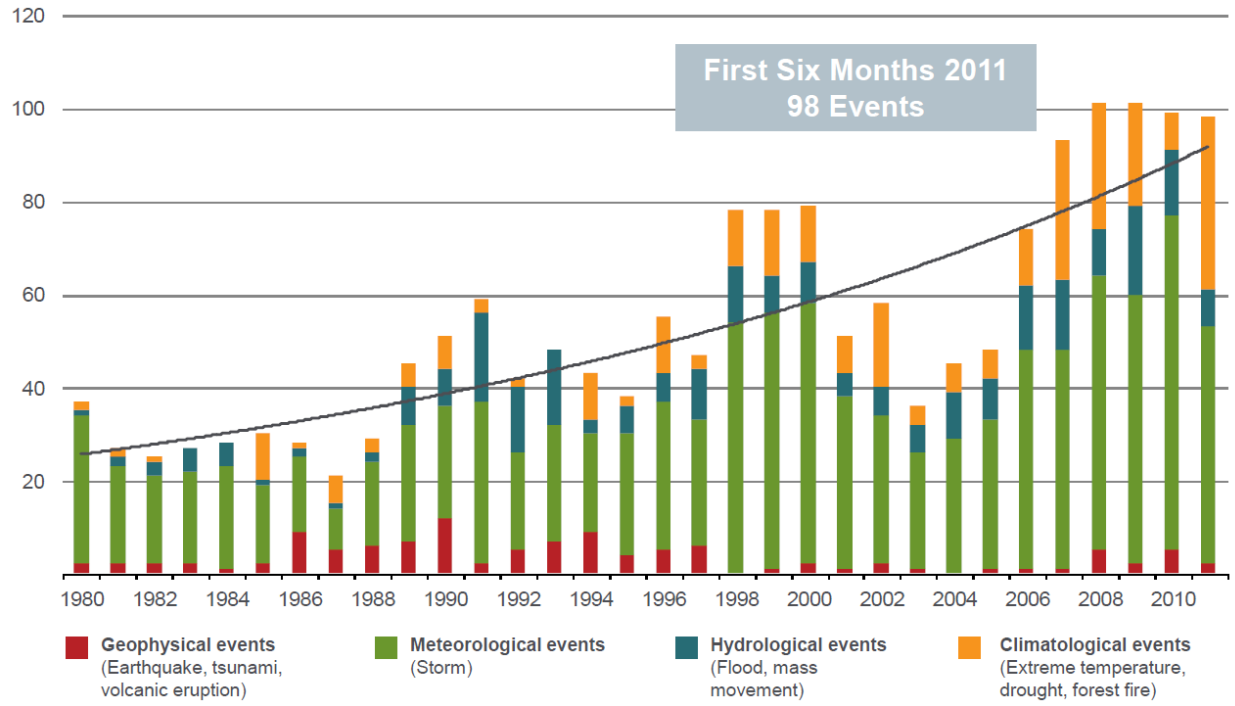


Figure 6.3:

In Canada, temperatures have warmed by an average of 0.24°C per decade, as indicated by data dating from the first official records of temperature conditions in 1948 through to 2010.[85] This figure represents twice

[78] Knutson and Tuleya [124]
[79] Villarini and Vecchi [258]
[80] ScienceDaily [190]
[81] Regarding heat waves, see: Bumbaco, Dello, and Bond [23].
[82] ScienceDaily [191]
[83]

5. See: "The long-term perspective" https://www.ipcc.ch/publications_and_data/ar4/syr/en/spms5.html

[84] 5
[85] The Institute for Catastrophic Loss Reduction [223], 13.

the global average, with temperature rises in the far north occurring at rates three times faster. The average national temperature in 2010 reached 3.0°C above normal, making it the hottest year on national records.[86] In addition, separate analyses conducted by NASA and NOAA both found that 2014 was the hottest year in modern record.[87]

According to the IPCC, it is "virtually certain" that "fewer cold days and nights" are taking place .[88] This is significant, for example, in western Canada, where cold winter nights help to control mountain pine beetle (Dendroctonus ponderosae) epidemics. In a future with fewer cold winters, mountain pine beetles will cause greater damage to the western Canadian forest industry. As of 2012, an ongoing mountain pine beetle epidemic had impacted approximately 750,000 hectares of forest, at a los s of billions of dollars to British Columbia, and has cost governments over a billion in research .[89][90]

Precipitation levels in Canada have risen during the past half-century, with mean national levels increasing by about 12 percent. This averages to about 20 more days of rain nationwide compared with the 1950s. As climate change accelerates, and the rate of warming increases, the conditions for more volatile weather patterns become more common .[91][92] Trends consistent with projections of climate models show increasing occurrence of extreme weather in Canada that can be traced back into the early 20th century. For instance, Figure 6.4 shows the increase in weather-related disasters in Canada over 100 years. By contrast, the number of geophysical disasters (earthquakes and landslides) that took place over the same time period has remained fairly consistent.[93]

As the e xtreme weather events become more frequent and longer in duration, the cost of dealing with such events also increases. In the United States, private insurers determined that 2012 was the most expensive year ever for disasters linked to climate change, with a total cost of $139 billion.[94] In Canada, the NRTEE projected that total costs associated with climate change could reach between $21 billion and $43 billion a year by the 2050s.[95] The range of estimates reflects uncertainty about the extent of action taken to reduce GHG emissions as well as other economic and population growth factors. Similarly, a report by the Institute for Catastrophic Loss Reduction (ICLR) for the Insurance Bureau of Canada (IBC) outlines trends of insured losses from severe weather and natural catastrophes both internationally and within Canada. The report reveals that financial impacts have ranged from between $10 and $50 billion dollars a year internationally since 2002, with levels exceeding $100 billion in 2011.[96] Within Canada, property insurance claims resulting

[86] The Institute for Catastrophic Loss Reduction [223], 13.

[87] NASA. "Nasa, Noaa Find 2014 Warmest Year in Modern Record." Janurary 16, 2015. http://www.nasa.gov/press/2015/january/nasa-determines-2014-warmest-year-in-modern-record/#.VMkZrmT-7xh

[88] 5, 53.

[89] Chapman, Veblen, and Schoennagel [32]

[90] ScienceDaily [190]

[91] (Research published in Nature Geoscience notes: "Precipitation extremes increase in intensity over many regions of the globe in simulations of a warming climate" O'Gorman [163].

[92] ScienceDaily [190]

[93] The Clean Air Partnership [216], 8.

[94] The Economist [221]

[95] National Round Table on the Environment and the Economy [155] , 15.

[96] The Institute for Catastrophic Loss Reduction [223], 5.

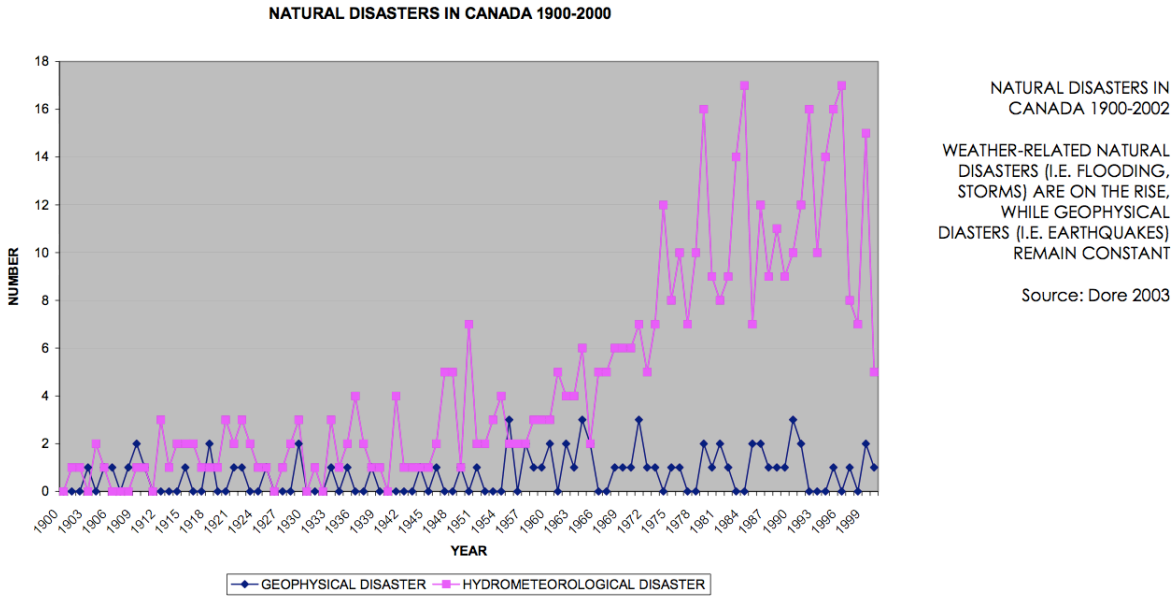


Figure 6.4:

from severe weather-related events from 2010-2012 have cost roughly $1 billion a year. The report outlines a number of specific examples of such claims, including:

- Hurricane Irene and the pursuing floods and windstorms between August 28 and 30, 2011 resulted in insured losses of $130M in New Brunswick, Ontario and Quebec.
- A severe wind and thunderstorm that took place on in June of 2010 in and around Leamington in Southern Ontario caused approximately $120 million worth of insured losses to both business and residential properties.
- Areas in Southern Alberta experienced a similar storm that resulted in excessive damage to private and commercial properties as well as automobiles that totalled over $500 million in losses.

As the report details, claims resulting from both severe and smaller-impact weather events represent significant property damage for consumers, with losses driven in large part from aging sewage and water infrastructure that cannot handle the new higher precipitation levels from climate change. Water-related insurance claims have "surpass[ed] fire as the number one cause of home insurance losses in many parts of the country".[97] The report also details projections of climate impacts on extreme weather events in Canada running through the 2050s, including hot days per year, wildfires, hail and ice storms, tornadoes, and heavy

[97] The Institute for Catastrophic Loss Reduction [223], 7.

rainfall events, and includes recommendations for dealing with the expansion of insurance-related losses nationwid e.

A July 2013 study prepared by the U.S. Department of Energy examined the risks posed by climate change and extreme weather to America's energy infrastructure. The report identifies impacts that are already being experienced, including fuel barges being impeded by low water levels in major waterways, floods and storms interfering with ports, and damage to transmission lines from storms.[98] Not all extreme weather events are consequences of climate change, but climate change has caused the number of extreme events to dramatically increase over the past three decades, resulting in skyrocketing costs for governments. In the 1980s, there was an average of 2 billion-dollar weather/climate disasters a year.[99] This figure reached 5.25 over the last twelve years. Also, the US Department of Energy's report suggests that climate change poses immense risks for energy production, in particular to thermoelectric power generation facilities, coastal energy infrastructure, oil and gas production, renewable energy (especially hydroelectric power), electricity transmission, fuel transport, and arctic oil and gas exploitation.[100] It also concludes that: "[i]ncreasing temperatures will likely increase electricity demand for cooling".[101][102]

In a report for Ceres — a network of investors, companies, and public interest groups seeking to accelerate and expand the adoption of sustainable business practices — Sharlene Leurig evaluated the threat of climate change to insurers. She concluded that: "This changing climate will profoundly alter insurers' business landscape, affecting the industry's ability to price physical perils, creating potentially vast new liabilities and threatening the performance of insurers' vast investment portfolios".[103] A climate that is changing increasingly rapidly is associated with severe weather, damage to infrastructure, and soaring costs. This corresponds with the finding of the NRTEE that "[g]lobal mitigation leading to a low climate change future reduces costs to Canada in the long term".[104]

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".[105][106][107] 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. Rising concentrations of heat-trapping greenhouse gases are changing our climate, with far reaching implications for our environment and our

[98] Broder [19]
[99] Smith, Katz, U.S. Billion-dollar Weather and Climate Disasters: Data Sources, Trends, Accuracy and Biases 2013.
[100] United States Department of Energy [246], I.
[101] United States Department of Energy [246], I.
[102] United States Department of Energy [246]
[103] Leurig [131], 9.
[104] National Round Table on the Environment and the Economy [155], 16.
[105] World Meteorological Organization [272], 15.
[106] Harrabin [98]
[107] Doyle [50]

oceans, which are absorbing both carbon dioxide and heat.[108]

The report notes a "very large increase (more than 2000 per cent) in the loss of life from heatwaves", as well as describing how "Central Canada experienced its warmest and most humid summer on record in 2005. 2010 was the warmest year on record for the nation as a whole since records began in 1948".[109]

As the damage from climate change mounts, the ability of individuals and firms to mitigate the risk through insurance may diminish. For instance, Blair Feltmate of the Climate Change Adaptation Project at the University of Waterloo projects that extreme weather arising from climate change will lead to "an uninsurable housing market in Canada in many, many regions".[110] Large-scale disasters are a particular threat to smaller insurers, given the danger that a large proportion of their policyholders may be impacted by a single extreme event.

Wildfires

Increased temperatures contribute to the frequency and severity of wildfires.[111][112] The fifth assessment report of the International Panel on Climate Change (2013) has found that wildfire frequency will increase with a warming climate, contributing to organic aerosol emissions. A 1991 study published in the Canadian Journal of Forest Research —still the most recent study— estimated more specifically that a doubling of atmospheric greenhouse gases would cause a 46 percent increase in seasonal severity rating, with a similar increase in area burned. Additionally, with this change in the composition of the Earth's atmosphere a 2004 study estimated that at least twice as many fires in California would "escape" and "exceed initial containment limits"; that twice as large an area would be burned; and that there would be "widespread impacts on vegetation distribution, forest condition, and carbon storage, and greatly increase the risk to property, natural resources and human life".[113][114] A 2006 study of wildfire activity in the western United States found that: "wildfire activity increased suddenly and markedly in the mid-1980s, with higher large-wildfire frequency, longer wildfire durations, and longer wildfire seasons" and that this is "strongly associated with increased spring and summer temperatures and an earlier spring snowmelt".[115] In the United States, the area burned annually by wildfires has grown to seven million acres, twice what it was during the 1990s.[116] According to the Australian government's Climate Commission: "Climate change has already increased the risk of extreme fire weather in some parts of Australia, especially the populous southeast".[117]

[108] World Meteorological Organization [272]
[109] World Meteorological Organization [272], 6 - 8.
[110] Bryden [21]
[111] 5, 33, 48, 50, 51, 53, 65
[112] Union of Concerned Scientists [237]
[113] Fried, Torn, and Mills [67], 169.
[114] Westerling and Bryant [263]
[115] Westerling et al. [264], 940-943.
[116] Barringer and Chang [10]
[117] Government of Australia Climate Commission [78], 4.

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.[118][119][120]

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 contributed to diarrhoea, flood injury, malaria, undernutrition, and related disease outcomes.[121] 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.[122]

The WHO also claims that global warming has been causing 140,000 deaths per year since 2004.[123] 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".[124] 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 climate-carbon crisis is estimated to claim 100 million lives between now and the end of the next decade".[125] 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

[118] World Health Organization [268]
[119] See also: McMicheal, Woodruff, and Hales.
[120] Jesdale, Morello-Frosch, and Cushing [120], 811-7.
[121] World Health Organization [271], 44.
[122] World Health Organization [271], 24.
[123] World Health Organization [269]
[124] DARA International [43], 16.
[125] DARA International [43], 17.

water-borne diseases, ultraviolet radiation, and air pollution.[126][127] 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 risks to the health and well-being of Canadians and their communities".[128]

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.[129][130] 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".[131] Also, a growing body of literature is drawing attention to the incommensurate impacts of climate change on vulnerable and marginalized populations.[132][133]

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)".[134] 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".[135]

[126] Health Canada [99]

[127] 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.

[128] Health Canada [99], 432.

[129] Fang et al. [59]

[130] ScienceDaily [191]

[131] World Health Organization [269]

[132] Costello et al. [39], 1693-1733.

[133] World Health Organization [270]

[134] The City of New York [215], 31.

[135] Government of Australia Climate Commission [78], 4.

In Canada, the relationship of health disparities to climate change impacts and adaptation is a newly emerging area of study. Recent reports predict that hotter city temperatures will lead to between five and ten additional deaths per 100,000 people per year by 2050 as well as contribute to increasing pressure on hospitals through sickness and other heat-related conditions that could swell associated costs to between $3 million to $8 million annually by the 2050s.[136] The NRTEE concluded that climate change "will lead to warmer summers and poorer air quality, resulting in increased deaths and illnesses in the four cities studied — Montréal, Toronto , Calgary, and Vancouver" and that this will impose costs on the health care system of between $3 million and $11 million per year by the 2050s.[137]

Ecosystem collapse

Climate change is expected to have a substantial effect on ecosystems and biodiversity around the world.[138] 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".[139] 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".[140]

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: these fish add to the discussion of threats to Canadian coastal environments described above; 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 $2 billion to economies in Russia, Japan, the U.S., and Canada and directly employed more than 35,000 people.[141] 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.[142] The report includes a detailed discussion of the problems that increas-

[136] National Round Table on the Environment and the Economy [155], 87.
[137] National Round Table on the Environment and the Economy [155], 16.
[138] Foden et al. [62], 1.
[139] Warren et al. [261], 1.
[140] United Nations Development Programme [238], 95.
[141] International Union for Conservation of Nature [118], 2.
[142] International Union for Conservation of Nature [118]

ing 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.

Warmer ocean temperatures have also been shown to reduce the abundance of other smaller fish in areas experiencing an influx of new warmer waters. 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 to salmon, as well as for the 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 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".[143] 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".[144] 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".[145][146] The report suggests that: "[t]he obvious solution to the potential threats posed by ocean acidification is to make rapid and substantial cuts to anthropogenic emissions to the atmosphere".[147] Canada's Department of

[143] 5, 52.
[144] 5, 48.
[145] United Nations Environment Programme [240], 8.
[146] Morello [147]
[147] United Nations Environment Programme [240], 8.

Fisheries and Oceans has also highlighted the danger of ocean acidification. In a 2013 report, they attribute the pheno m e n on's "unprecedented rate of occurrence" to "the significant amount of carbon dioxide that has been added to the atmosphere over the past 250 years".[148] 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.[149]

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.[150]

Because of both warming and the acidification of the world's oceans in response to rising concentrations, coral reefs are especially vulnerable to climate change.[151] In their Fourth Assessment Report, the IPCC concluded that increased coral bleaching would accompany warming of 1 $^\circ$C, most corals will be bleached above 1 $^\circ$C, and "widespread coral mortality" is expected above 2.5 $^\circ$C.[152] 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.[153] Caribbean corals are also experiencing record thermal stress, bleaching, and mortality.[154] 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".[155] It concludes that: "[t]he result will be less diverse reef communities and carbonate reef structures that fail to be maintained".[156] 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 billion per year.[157]

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".[158][159][160] One 2013 study found that "608-851 bird (6-9 percent), 670-933 amphibian (11-15

[148] Fisheries and Oceans Canada [61], 4.
[149] Fisheries and Oceans Canada [61], 6.
[150] Fisheries and Oceans Canada [61], 13.
[151] ScienceDaily [191]
[152] 5, 51.
[153] De'ath et al. [47]
[154] Eakin et al. [52]
[155] Hoegh-Guldberg et al. [102], 1737-1742.
[156] Hoegh-Guldberg et al. [102], 1737-1742.
[157] National Oceanic and Atmospheric Administration [150]
[158] International Arctic Science Committee [113] , 10.
[159] Post et al. [177]
[160] Weber [262]

percent), and 47-73 coral species (6-9 percent)" are "highly climate change vulnerable".[161] 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.[162][163] 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".[164]

Divest McGill certainly believes this counts as grave environmental damage.

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" and states that more than 13 percent of Canada's gross domestic product depends on healthy ecosystems.[165] 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, percent of plants and percent of animals are likely to lose 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".[166]

Threats to First Nations groups and Indigenous cultures

Climate change threats to northern Canada, as well as the Aboriginal communities that live there, are becoming increasingly recognized. For example, Natural Resources Canada's national assessment "From Impacts to Adaptation: Canada in a Changing Climate 2007" states that "resource-dependent and Aboriginal communities are particularly vulnerable to climate changes", and emphasizes that "vulnerability" to climate change risk is "magnified in the Arctic".[167] In 2004, the Arctic Council and the International Arctic Science Committee (IASC) issued a report entitled the "Arctic Climate Impact Assessment" that aimed to synthesize knowledge on climate variability and to assess and predict the impact of climate change on arctic regions and communities going into the future.[168] The report contains contributions from over 300 scientists, professionals, and Aboriginal community leaders and reveals that future climate change could be devastating for numerous Inuit communities. These findings are supported by a more recent study conducted by researchers from McGill University that focused on two separate Inuit communities.[169] The study identifies that "climatic conditions which currently pose risks are expected to be negatively affected by future climate

[161] Foden et al. [62], 1.
[162] BirdLife International [14], 15.
[163] Paris [168]
[164] BirdLife International [14]
[165] De Souza [46]
[166] Warren et al. [261]
[167] Natural Resources Canada [157], 3 - 14.
[168] International Arctic Science Committee [113]
[169] Ford et al. [64]

change" and explains that "young Inuit and those without access to economic resources, in particular, are vulnerable".[170]

According to a 2009 article in Global Environmental Change , "health inequality [in relation to climate change] is particularly pronounced among Aboriginal Canadians".[171] Climate change in general "has been identified as potentially the biggest health threat of the 21st century", and the article goes on to explain that "[t]he existing burden of ill-health increases the sensitivity of Indigenous peoples to the adverse impacts of climate change, which combined with a proportionally higher dependence of many Indigenous livelihoods on the environment, spiritual and cultural ties to the land, demographic trends, and experience of marginalization, makes Indigenous peoples particularly vulnerable".[172]

Threats to the infrastructure of cities

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 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".[173] In Canada, over 200 municipalitie s (including Montreal and 24 other Quebec municipalities) are taking part in the Partners for Clim ate Protection program, which is the Canadian component of the Cities for Climate Protection Network (a project of the International Council for Local Environmental Initiative).[174]

High density cities such as Montreal 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. The January 1998 ice storm of Montreal and surrounding areas were the most costly of extreme climate events in Canada's history at the time. The insured losses were over $1.6B, and the total economic costs were estimated in the $5B to $7B range.[175] 15 years later, in 2013, Canada experiences a new record high in insured losses due to extreme climate events: the December 2013 ice storm, affecting central and eastern Canada as well as northeastern United States with estimated losses (within Canada) of up to $3B.[176]

More frequent storms and severe weather will likely continue to cause damage to city infrastructure and put strain on city resources. The floods, storms, droughts and other weather-related phenomena that already occur annually in Canada can cost hundreds of millions of dollars.[177] Furthermore, recent events such as

[170] Ford et al. [64], 45 - 54.
[171] Ford et al. [63], 1.
[172] Ford et al. [63], 1.
[173] The City of New York [215] , 2.
[174] ICLEI Local Governments for Sustainability, "Partners for Climate Protection" http://www.icleicanada.org/programs/mitigation/pcp.
[175] The Institute for Catastrophic Loss Reduction (ICLR). Telling the Weather Story 2012.
[176] McGillivray, Glenn. "Icy Finish." Canadian Underwriter , January 1, 2014.
[177] Health Canada [99], 11.

Hurricane Sandy 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 .

Abrupt and non-linear adverse climate impacts

The Earth's climate system includes some powerful positive feedback mechanisms capable of multiplying the climate-altering effect of GHGs. For instance, tropical ecosystems can generate significant quantities of CO 2 when temperatures rise.[178][179] 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.[180][181][182] 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.[183] 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.[184]

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."[185][186][187][188]

Several potentially dangerous 'tipping points' have been identified by scientists, including the danger that the thermohaline 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.[189] Writing in Nature in 2009, Johan Rockstrom et al. explain that:

[178] Wangsness [260]
[179] ScienceDaily [191]
[180] Whiteman, Hope, and Wadhams [266]
[181] See also: Levy et al..
[182] Vidal [257]
[183] Hansen [94]
[184] United States National Aeronautics and Space Administration [250]
[185] United States National Aeronautics and Space Administration [250]
[186] Vaks et al. [255], 183-6.
[187] @15permafrost
[188] Bakewell [9]
[189] 5

We propose that human changes to atmospheric concentrations should not exceed 350 parts per million by volume, and that radiative forcing should not exceed 1 watt per square metre above pre-industrial levels. Transgressing these boundaries will increase the risk 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 concentration stands at 387 p.p.m.v. and the change in radiative forcing is 1.5 W .[190]

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 uptake [that] may feed back on the climate system".[191]

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.[192] 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' ".[193] 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 in its atmosphere.[194] 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.[195] Research published in Nature Geoscience in July 2013 concluded that the threshold for such runaway warming may be lower than previously estimated.[196]

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 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.[197] A 2003

[190] Rockstrom et al. [184]
[191] 5, 53.
[192] Sahney and Benton [185], 759-765.
[193] Benton and Twitchett [12], 358.
[194] Rasool and De Bergh [179]
[195] Hansen et al. [96], 22-23.
[196] Goldblatt et al. [75]
[197] Craven [41]

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.[198]

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".[199] A report prepared for the Center 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".[200] A joint report from the Center for Strategic and International Studies and the Center 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".[201] 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".[202]

In 2012, the U.S. National Academy of Sciences published a report on: "Climate and Social Stress: Implications for Security Analysis".[203] 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 stress communities, societies, governments, and the globally integrated systems that support human well-being.[204]

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.[205]

[198] Schwartz and Randall [188], 22.
[199] Schwartz and Randall [188], 1.
[200] Center for Naval Analyses [30], 3.
[201] Center for Strategic and International Studies and the Center for a New American Security [31], 78.
[202] Center for Strategic and International Studies and the Center for a New American Security [31], 78.
[203] 6
[204]

6. See: S-2.

[205] 6 . See: S-4.

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".[206]

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.[207]

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".[208] In 2012, officials from the Canadian Security and Intelligence Service and DND attended a briefing on the security risks posed by climate change.[209] The presentation — which has been declassified for release through access to information legislation — described climate change impacts including extreme weather events, impacts on coastal cities, damage to food security, and loss of biodiversity.

The role of McGill University regarding climate change action

Meaningful action on climate change is central to the sustainability agenda of the University's, which is "fundamental to McGill's mission and value in society" (Vision 2020 Strategy, McGill University, 2014).

Climate change action is central to McGill University's sustainability agenda

McGill University's Sustainability Policy (2010) stated that University's mission "will be attained responsibly by carrying out its activities in a manner that achieves a balance between the social, economic and environmental dimensions of sustainability." (McGill University Sustainability Policy, 2010). In light of the clear and demonstrable social, economic and environmental harms attributable to continuing fossil fuel use, it is clear that the shift away from fossil fuels must be central to this sustainability agenda. While local campus-based initiatives described in the Vision 2020 Strategy can play a role in achieving this mission, the University's sustainability agenda will only be credible if it is applied consistently - that it "walks the talk" (Vision 2020 Strategy, McGill University 2014). This must apply to the values expressed through financial decisions, including the University endowment.

[206] Bender [11]
[207] Dalby [42]
[208] Byers and Webb [24], 25.
[209] De Souza [46]

Specifically, the Vision 2020 statement advocates that "McGill's financial portfolio is managed according to principles of sustainability (social, economic and environmental)." (Vision 2020 Strategy, McGill University, 2014). The successful inclusion of environmental sustainability in the CAMSR terms of reference were one immediate "priority actions" which has now been achieved. The way in which CAMSR applies these new terms of reference will be a critical test of the seriousness with which the University takes its stated environmental sustainability agenda.

Divestment is consistent with McGill's ambition for leadership in sustainability

McGill's ambitious Sustainability Policy aspires to "achieve the highest possible standards of sustainability" and "become an institutional model of sustainability for society" (McGill University Sustainability Policy, 2010). In order to realise this ambition, McGill will need to lead by example - to place itself at the forefront of sustainable institutions. Divestment will send a clear message that the University takes its leadership role seriously. McGill should be at the forefront of the divestment movement, joining the ranks of a number of leading academic institutions which have begun, or intend to begin, fossil fuel divestment of their endowments. In the lead up to the important 2015 Paris Climate Summit, the reputations of institutions such as McGill will be considerably enhanced if they are seen to be at the forefront of this inevitable shift towards a fossil-fuel free business model. Conversely, if McGill decides to wait until after all of its peer institutions have divested, the University could hardly be described as an "institutional model of sustainability".

McGill's international reputation is linked to implementing sustainability

The McGill "Policy Action Briefs", envisage CAMSR undertaking a review into the "best practices in the field of socially responsible investment". It explicitly anticipates pursuing accreditation and rating using the best-practice Sustainability Tracking, Assessment and Rating System (STARS) self-reporting framework. Under this program, credits are awarded to Universities with endowments of $1 million or larger whose investments funds are consistent with sustainable investment. Credits are earned if University endowment policies "Investor Engagement" option, which is consistent with approach taken in McGill's Sustainability policy, includes the following:

"Has a publicly available investment policy with negative screens, for example to

prohibit investment in an industry (e.g. tobacco or weapons manufacturing) or

participate in a divestment effort (e.g. targeting fossil fuel production or human rights violations). "[210]

Hence, fossil fuel divestment is a strategy which is not only coherent with McGill's Sustainability agenda but it is also valued highly by the international ratings systems adopted by many top tier institutions. Therefore,

[210]STARS 2.0 Technical Manual, 2014: 298, https://stars.aashe.org/pages/about/technical-manual.html) .

adoption of a divestment policy will demonstrate a serious commitment to sustainability that "walks the talk" and benefits McGill's international standing.

Academic work at McGill strengthens the case for divestment

McGill hosts leading global experts on climate change, whose research plays a lead role in the policy development around climate change globally. The Climate Change Adaptation Research Group, based in the Department of Geography, has conducted research focusing upon adaptation strategies of vulnerable communities to climate change. Academic work from within Department of Earth and Planetary Sciences has had a major impact globally in the understanding of climate change. McGill University has played an important role establishing the scientific consensus around climate change. By adopting a policy of fossil fuel divestment, the University will be acting in a way that is consistent with the inevitable conclusions of its own climate change researchers.

In summary: McGill University strives to be a leader in sustainability, which stands in direct contrast to its current policy of investing in entities which promote continuing fossil fuels use. McGill's reputation will hinge upon its ability to bring its investment policies in line with its leadership ambitions. Divestment is not only consistent with McGill's Vision 2020 strategy, but will also lend credibility to its considered goal of leading by example - 'walking the talk'.

Even fossil fuel companies now acknowledge climate change's danger

Fossil fuel companies explicitly acknowledge that climate change poses a threat to the world at large, as well as to their operations and profitability.[211][212][213][214] In their 2011 submission to the Carbon Disclosure Project, ExxonMobil acknowledged "risks to society and ecosystems from rising greenhouse gas emissions".[215] 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 emissions in the atmosphere is going to have an impact. It'll have a warming impact".[216] 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".[217] They also assert that"effective climate change policy must...

[211] Cheeseman [33]
[212] Koronowski [126]
[213] Skuce [201]
[214] Sheppard [195]
[215] ExxonMobil [57]
[216] Tillerson [229]
[217] ConocoPhillips [37]

[r]esult in the stabilization of global GHG atmospheric concentrations at safe levels". On their global website, Shell says that:"emissions must be reduced to avoid serious climate change".[218][219] Chevron's website asserts that:"a successful climate policy will be one in which the reduction of GHGs is accomplished equitably by the top emitting countries of the world through long-term and coordinated national frameworks".[220] 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 emissions, it will"probably not [be] enough to limit warming to no more than 2 ° C".[221] Entergy — an S&P 500 energy company with nearly 15,000 employees — also acknowledges material risks from climate change. Jeff Williams, director of climate consulting for Entergy, states:"Clearly we are facing risks from sea level rise, more intense storms, flooding and surge damage".[222]

In numerous advertising campaigns, fossil fuel companies have acknowledged that climate change is taking place, and even that they bear some responsibility for dealing with it. At the same time, much of the fossil fuel industry's advertising is misleading in its description of environmental effects. For instance, recent advertising in Canada has misrepresented the effect of oil sands extraction on freshwater.[223] Shell has also had two recent advertising campaigns — 'New Energy Future' and 'Let's Go' — which acknowledge the existence of climate change and the need to take action on it. The campaigns acknowledge the need to "limit emissions" and "tackl[e] climate change". At the same time, the campaigns promote Shell's expansion into unconventional fossil fuel resources, such as the Athabasca oil sands, which threaten to undermine the global effort to keep climate change at a safe level. When the ad campaigns were challenged by the World Wildlife Fund in August 2008, the U.K. Advertising Standards Authority concluded that they were misleading.[224] In their assessment, the authority described how the "large scale of the oil sands developments had considerable social and environmental impacts, including those on water conservation, greenhouse gas emissions (GHG), land disturbance and waste management". The authority concluded that: "Because 'sustainable' was an ambiguous term, and because we had not seen data that showed how Shell was effectively managing carbon emissions from its oil sands projects in order to limit climate change, we concluded that on this point the ad was misleading". Shell was ordered to take the advertisement down and not republish it in the same form. In 2007, the same body found that another Shell advertisement violated the 'Truthfulness' and 'Environmental claims' provisions of U.K. advertising law.[225]

As elaborated in there are many parallels between fossil fuel divestment and divestment from tobacco companies. These include the awareness of the producers themselves that their products are harmful and dangerous. When the University of Toronto decided to divest from tobacco companies, it noted the significance of tobacco companies themselves acknowledging the health risks of smoking: "that there is no serious academic

[218] Shell [193]
[219] Shell also has a climate change advisor, with a blog at: http://blogs.shell.com/climatechange/
[220] Chevron [34]
[221] BP PLC [17]
[222] Gunther [92]
[223] Suleman [210]
[224] U.K. Advertising Standards Authority [234]
[225] U.K. Advertising Standards Authority [233]

or social debate about tobacco's health effects - even tobacco manufacturers by now concede them."[226] The statements made by fossil fuel companies about climate change put them in a similar position.

Climate change violates domestic law in numerous jurisdictions

We show extensively in this submission that climate change frustrates domestic Canadian and American law as well as international law. For the moment, it is relevant to point out that legislation and courts in other domestic jurisdictions have recognized climate change as a grave harm.

A limited recognition of the seriousness of climate change can be found in some lega l 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.[227] During the trial, the jurors heard testimony from NASA climatologist James Hansen.

In a small number of cases, Australian courts have asserted the need to consider GHG emissions. In "Australian Conservation Foundation v. Minister for Planning", it was decided that GHG emissions must be considered when evaluating plans to expand coal mines.[228] In "Gray v. The Minister for Planning and Ors", the Land and Environment Court of New South Wales found that GHG emissions from coal burning must be considered during environmental assessments of coal mines.[229] The court found that cumulative GHG emissions play an important role in intergenerational equity, and that the precautionary principle should be applied when "there is, or will be, a serious or irreversible threat of environmental damage".

When it added articles 71-74 to its constitution in 2008, Ecuador became the first nation to grant the environment the inalienable right to exist, persist, and be respected. For instance, article 73 holds that: "The State shall apply preventive and restrictive measures on activities that might lead to the extinction of species, the destruction of ecosystems and the permanent alteration of natural cycles".[230] Following this example, Bolivia amended its constitution in 2011 with the Rights of Mother Earth Act (articles 56-60).[231][232]

The domestic law of several other countries criminalizes "ecocide" — a phenomenon defined by Polly Higgins as: "The extensive damage to, destruction of or loss of ecosystem(s) of a given territory, whether by human agency or by other causes, to such an extent that peaceful enjoyment by the inhabitants of that territory has been or will be severely diminished".[233] Article 342 of the Penal Code of Vietnam concerns "crimes against mankind" and states that:

[226] Girard [72]
[227] McCarthy [135]
[228] Victorian Civil and Administrative Tribunal [256]
[229] Land and Environment Court of New South Wales [128]
[230] Republic of Ecuador [181]
[231] Plurinational State of Bolivia [176], 28-29.
[232] Eaton [53]
[233] Higgins [101]

Those who, in peace time or wartime, commit acts of annihilating en-mass population in an area, destroying the source of their livelihood, undermining the cultural and spiritual life of a country, upsetting the foundation of a society with a view to undermining such society, as well as other acts of genocide or acts of ecocide or destroying the natural environment, shall be sentenced to between ten years and twenty years of imprisonment, life imprisonment or capital punishment.[234]

Article 394 of the Criminal Code of the Republic of Armenia similarly prohibits ecocide, as does the Criminal Code of Belarus, the Criminal Code of Moldova, the Criminal Code of Ukraine, and the Criminal Code of Georgia.[235] ,[236] ,[237] ,[238] ,[239]

[234]Government of Vietnam [87]
[235]Government of Armenia [77]
[236]International Committee of the Red Cross [114]
[237]Government of Moldova [82]
[238]Government of Ukraine [86]
[239]Government of Georgia [81]

Point 3: These companies frustrate the enactment and enforcement of the domestic and international laws that protect individuals' health, safety, and basic freedoms

The socially injurious activities of fossil fuel companies frustrate theenactment and enforcement of the domestic and international laws that protect individuals' health, safety, and basic freedoms . This includes the violation of specific domestic and international statutes, the violation of common law duties, such as domestic mitigation efforts , through the creation of nuisance, and the frustration of international diplomatic efforts to address climate change. Fossil fuel companies have also been active in preventing the emergence of such policies and meaningful constraints . 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.[1] Effective climate change policies will need to remain in place for decades while global emissions fall. The success of fossil fuel industries in preventing the passage and enforcement of such legislation further represents a clear threat to the health and safety of individuals across the globe.

The fossil fuel industry and climate change denial

The fossil fuel industry has a vested interest in climate change inaction

This submission is based on the argument that climate change is a shared problem of producers (the fossil fuel industry), consumers, and policymakers (government). That said, this is not the same as saying that responsibility is equally shared nor that all three groups are intentionally worsening the problem. Consumers want energy, but do not need this energy to come from fossil fuels and almost universally would prefer it did not. Only the fossil fuel industry needs all parts of society to be addicted to fossil fuels. And today only the fossil fuel industry is fighting tooth and nail against action to prevent climate change. In addition, as

[1] Lazarus [129], 101: 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.".

~~the supplier of fossil fuels, fossil fuel companies bear a large responsibility for the problem of climate change.~~ In addition, despite the astronomical profits, the fossil fuel industry creates relatively few jobs and so is a natural choke point for action on climate change. For example, in Canada today clean energy provides more jobs than the oil sands.[2]

Fossil fuel company responsibility goes much farther than this, however, as we explore in the rest of this section.

Undermining Science: The Fossil-Fuel Industry's Anti-Scientific Propaganda

For the past two decades the fossil fuel industry has spent millions of dollars to confuse the public, influence media coverage, and bully scientists.[3] Their money keeps the crisis of climate change out of the political sphere and undermines the influence of science in public discourse.

The strategy of large fossil fuel companies mirrors the strategy of the tobacco industry. In denying an airtight scientific consensus outlining the harms of their industry, fossil fuel companies skillfully created the impression of uncertainty and debate for many decades in the by funding phony science and by using their immense resources to exaggerate doubt and ensure these distortions were in the hands of journalists, politicians, and educators. Their plans are well-documented thanks to a series of leaks and evidence provided from lawsuits.[4]

Many of the fossil fuel companies that McGill invests in were part of the Global Climate Coalition, a group formed to fight greater regulatory involvement, and especially the Kyoto Protocols. GCC internal documents conceded that the science documenting climate change is undeniable, yet the organization externally continued to promote doubt.[5]

When it started to become public that fossil fuel companies were funding phony science, most companies pulled out of the GCC in 2002. Since then, only ExxonMobil has continued to fund climate denial. The company has yearly spent around $20 million dollars over the past decade funding academics and journalists to publish climate denial material. This trend reached a peak in 2009 with $27.5 million dollars being paid to their various environmental skeptics partners.[6] They also offered thousands of dollars to any scientist willing to write briefs contradicting the findings of the Intergovernmental Panel on Climate Change, the

[2]"Clean Energy Provides More Jobs than Oilsands, Report Says." CBCnews. December 2, 2014. Accessed February 1, 2015. http://www.cbc.ca/news/business/clean-energy-provides-more-jobs-than-oilsands-report-says-1.2857520

[3]Drum, Kevin. "Climate Gate." Mother Jones. November 30, 2009. http://www.motherjones.com/kevin-drum/2009/11/climategate

[4]New York Times. "Advisers to Industry Group Weigh In on Warning." 2007. http://documents.nytimes.com/global-climate-coalition-aiam-climate-change-primer#p=1 .

[5]Revkin, Andrew C. "Industry Ignored Its Scientists on Climate." 23 Apr. 2009. The New York Times. http://www.nytimes.com/2009/04/24/science/earth/24deny.html?pagewanted=1&_r=0 .

[6]Gingerich, Jon. "The Politics of Climate Change " , Odwyer's Magazine , February 2010. http://www.odwyerpr.com/editorial/0201the-politics-of-climate-change.html

international authority on climate change.[7]

Shareholder action against them in 2006 and 2007 along with a large public outcry caused Exxon-Mobil to stop funding the most egregious deniers, yet they continue funding another few dozen such groups.[8] ,[9] ,[10]

Because other fossil fuel companies feared public backlash, their continued involvement in undermining public understanding of the scientific consensus around climate change and its causes is more subtle. They continue to be members and funders of unabashed denial groups such as the American Petroleum Institute and the United States Chamber of Commerce.[11][12] Or these companies fund industry lobbying associations such as the Canadian Association of Petroleum Producers who claim to stand for sustainability and responsibility in the face of climate change, but who, in actual fact, undermine climate action, for instance, with their opposition to the Kyoto Protocol or its marketing for the tar sands.[13]

These activities have successfully stymied collective action to solve this problem. Politicians have made little headway in passing policy to curb emissions, and large tax breaks and subsidies for fossil fuel extraction remain.

Fossil fuel companies lobby against action on climate change

In Canada

In Canada, fossil fuel influence over the government has become a kind of truism. Our point here is not to condemn one Canadian party over another but to illustrate the lengths fossil fuel companies go to get political influence and how they use it. Perhaps the most striking example is a document, obtained under Access to Information, naming energy companies as "allies" and aboriginal and environmental groups as "adversaries" in a public relations campaign to defeat environmental legislation in Europe and improve the image of the tar sands.[14] That foreign multinational corporations would be listed as "allies" and domestic environmental groups and aboriginal inhabitants "adversaries" is striking. This sentiment is exemplified by

[7] Sample, Ian. "Scientists Offered Cash to Dispute Climate Study." February 2, 2007. The Guardian. http://www.guardian.co.uk/environment/2007/feb/02/frontpagenews.climatechange

[8] Exxpose Exxon. "Shareholder Activism." http://www.exxposeexxon.com/action/shareholder-activism.html .

[9] Sheppard, Kate. "Exxon Still Sponsoring Deniers." 10 Feb 2010. Mother Jones. http://www.motherjones.com/blue-marble/2010/02/climate-denial-still-brought-you-exxonmobil .

[10] Owen, Jonathan and Paul Bignell. "Think-tanks Take Oil Money and Use It to Fund Climate Deniers: Exxon-Mobil Cash Supporting Concerted Campaign to Undermine Case for Man-Made Warming." 7 Feb 2010. The Independent. http://www.independent.co.uk/environment/climate-change/thinktanks-take-oil-money-and-use-it-to-fund-climate-deniers-1891747.html .

[11] American Petroleum Institute. "API Member Companies." http://www.api.org/globalitems/globalheaderpages/membership/api-member-companies.aspx .

[12] Greenpeace. "Maps." ExxonSecrets. http://www.exxonsecrets.org/maps.php .

[13] De Souza, Mike. "Marketing campaign boosted oilsand image in key markets: poll". O Canada. http://o.canada.com/news/politics-and-the-nation/social-policy-and-environment/marketing-campaign-boosted-oilsands-image-in-key-markets-poll

[14] Fitzpatrick, Meagan. "Oilsands 'allies' and 'adversaries' named in federal documents". CBC. http://www.cbc.ca/news/politics/story/2012/01/26/pol-oilsands-campaign.html .

~~the fact that the RCMP has begun spying on Canada's environmental groups, some of whom based on~~ suspicions they may become radicalized in the future.[15]

As another example, the government severely weakened a series of environmental laws in Omnibus bills C-38 and C-45, which helped spark the Idle No More protests. Already, these laws were seen as crass giveaways to fossil fuel industries and a terrible loss of protection for Canada's environment and native peoples. Worse was the discovery that five out of six of these changes were precisely the changes requested in a letter by chief oil lobbyists barely a year earlier, including the removal of federal protection from millions of waterways, which would facilitate pipeline projects.[16][17] The Canadian Association of Petroleum Producers (CAPP)—of which all major fossil fuel companies operating in Canada are a member—was one of the signatories of this letter. The CAPP has often proposed the use of a " holistic" approach to the review of environmental regulations. The omnibus strategy they advocate is typically used as a "tool to avoid public debate".[18]

In the United States of America

In the US, fossil fuel companies spend millions of dollars a year to ensure disproportionate influence over the political process, particularly at the national level. In the US, lobbying expenses are led by Shell and ExxonMobil, with spending at about 11 and 10 million dollars annually since 2010.[19] Lobbying expenses are over and above political donations: for instance, ExxonMobil spent another $1.5 million in the US 2012 election.[20] Chevron spent about $9.6 million for the past three years on lobbying and about $850,000 in the last US election. They have flooded the political system with corporate donations, and use this influence to keep somewhere from $10 to $52 billion in subsidies for their industries and prevent concrete action on climate change.

In 2001, the Bush administration's energy task-force held over 40 meetings with industry experts, including James J. Rouse, then vice president of ExxonMobil and a major donor to the Bush inauguration, longtime Bush supporter Kenneth L. Lay, then head of Enron Corp., representatives from BP, the National Mining Association and the American Petroleum Institute. Many of these executives met directly with Vice-President Cheney, who chaired the task force, and the executive director of the task force, Andrew Lundquist, who later went on to work as a lobbyist representing groups that had met with the task force, including as BP

[15]Tello, Carlos. "Canada more at risk from environmentalists than religiously inspired terrorists: RCMP". VancouverObserver. http://www.vancouverobserver.com/news/canada-more-risk-environmentalists-religiously-inspired-terrorists-rcmp

[16]Roberts, Yan. "A Love Letter to Harper From the Oil Industry". Huffington Post. http://www.huffingtonpost.ca/yan-roberts/omnibus-harper-oil_b_2474752.html .

[17]De Souza, Mike. "Feds pressured by coal industry to weaken regulations, records reveal". Canada.com. http://www.canada.com/news/Feds+pressured+coal+industry+weaken+regulations+records+reveal/6497750/story.html

[18]De Souza, Mike. "Blog: Stephen Harper's 'omnibus' strategy to overhaul green laws was proposed by oil indurty, says records". O.Canada.com. http://o.canada.com/technology/environment/blog-stephen-harpers-omnibus-strategy-to-overhaul-green-laws-was-proposed-by-oil-industry-says-records

[19]Open Secrets. "Exxon Mobil: Summary". OpenSecrets. http://www.opensecrets.org/lobby/clientsum.php?id=D000000129

[20]Influence Explorer. "Exxon Mobil". InfluenceExplorer. http://influenceexplorer.com/organization/exxon-mobil/819555dfc3d449d2be54286f0cb385e2

and the American Petroleum Institute. These meetings, particularly with the American Mining Association, were critical in determining the administration's policy that it would be the Energy Department, rather than the Environmental Protection Agency (EPA), responsible for addressing the issue of global warming .[21]

The role of industry was decisive in the Bush administration's decision to declare that carbon dioxide was not a pollutant under the Clean Air Act,[22] therefore almost entirely undermining the EPA's ability to address carbon emissions. In 2007, the U.S. Supreme Court decided "Massachusetts v. Environmental Protection Agency" — a suit brought by twelve states and several cities against the EPA.[23] Justice John Paul Stevens stated in his opinion that: "[t]he harms associated with climate change are serious and well-recognized" and that the "EPA does not dispute the existence of a causal connection between man-made greenhouse gas emissions and global warming". The court held that the Clean Air Act (CAA) grants the EPA the authority to regulate tailpipe emissions of GHGs, and required the EPA to review its rationale for not regulating other GHG emissions:

Under the clear terms of the Clean Air Act , EPA can avoid taking further action only if it determines that greenhouse gases do not contribute to climate change or if it provides some reasonable explanation as to why it cannot or will not exercise its discretion to determine whether they do.[24]

The court found that the failure of the EPA to regulate GHG emissions under the CAA violated the law's "clear statutory command".[25] In an April 17th 2009 decision, the EPA determined that six GHGs are indeed a danger to the environment and human health.[26][27]

In direct response to this decision, the organization Americans for Prosperity, linked financially to billionaires Charles and David Koch, launched a "No Climate Tax" pledge, by which lawmakers pledged to " oppose any legislation relating to climate change that includes a net increase in government revenue ." The pledge has been signed by over four hundred elected officials. The pledge directly targeted cap-and-trade energy bills, which failed to pass the Senate twice. In 2013, the pledge had been signed by a third of the House and a quarter of the Senate. Of the seventy-six incoming freshmen Republican congressmen in 2010 who signed the pledge, fifty-seven had received political campaign contributions from KochPac.[28]

The fossil fuel industry is also notorious for successfully lobbying against the adoption of the Kyoto protocol in the US. The Global Climate Coalition, which included the American Petroleum Institute (of which all our target companies operating in the United States are members), spent a decade opposing Kyoto on the

[21] Abramowitz, Michael, and Steven Mufson. "Papers Detail Industry's Role in Cheney's Energy Report." Washington Post. July 18, 2007. Accessed February 1, 2015. http://www.washingtonpost.com/wp-dyn/content/article/2007/07/17/AR2007071701987.html

[22] Dickinson, Tim. "Six Years of Deceit." Rolling Stone. June 28, 2007. Accessed February 1, 2015. http://www.rollingstone.com/politics/news/six-years-of-deceit-20070628?page=2

[23] United States Supreme Court [251]

[24] United States Supreme Court [251], 30.

[25] Greenhouse [90]

[26] United States Environmental Protection Agency [248]

[27] The Economist [220]

[28] Mayer, Jane. "Koch Pledge Tied to Congressional Climate Inaction." The New Yorker. June 30, 2013. Accessed February 1, 2015. http://www.newyorker.com/news/news-desk/koch-pledge-tied-to-congressional-climate-inaction

basis of the "uncertainty" of scientists, while its own experts stated in an internal report: " The scientific basis for the Greenhouse Effect and the potential impact of human emissions of greenhouse gases such as CO2 on climate is well established and cannot be denied."[29] Briefing notes obtained under the Freedom of Information Act directly linked the coalition to the failure of Kyoto's passage: "Potus [president of the United States] rejected Kyoto in part based on input from you [the Global Climate Coalition]" read one memo.[30] Other documents cited chief officials within the Bush administration thanking the executives of ExxonMobil for their "active involvement" in determining the administration's climate policy, and asking for additional input from the company as to what policies they would be in support of. These documents decisively linked industry consultation to the Bush Administration's decision to reject the Kyoto treaty .[31]

Despite the change in administration, the dominant influence of the fossil fuel industry in United States politics remains. In 2010, a Washington Post report found that three of every four oil and gas lobbyists had previously worked for the federal government[32] . Transcanada spent over $1 million in 2013 lobbying legislators in the United States to support the passage of the Keystone XL pipeline.[33] The deep entrenchment of the fossil fuel industry in American politics has been critical in preventing the federal government from acting responsibly to address climate change.

Promoting False Hope: Carbon Capture and Sequestration

Exploiting the cultural optimism about the potential of technology to extricate humanity from the problem of climate change, fossil fuels use the false hope of Carbon Capture and Sequestration to promote inaction on climate change.

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.[34] 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.[35] 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.[36] It must be remembered that at the current rate of global carbon emissions, the entire budget of

[29]Revkin, Andrew. "Industry Ignored Its Scientists on Climate." The New York Times. April 23, 2009. Accessed February 1, 2015. http://www.nytimes.com/2009/04/24/science/earth/24deny.html?pagewanted=all .

[30]Vidal, John. "Revealed: How Oil Giant Influenced Bush." The Guardian. June 8, 2005. Accessed February 1, 2015. http://www.theguardian.com/news/2005/jun/08/usnews.climatechange

[31]Ibid.

[32]Eggen, Dan, and Kimberly Kindy. "Three of Every Four Oil and Gas Lobbyists Worked for Federal Government." Washington Post. July 22, 2010. Accessed February 1, 2015. http://www.washingtonpost.com/wp-dyn/content/article/2010/07/21/AR2010072106468.html .

[33]Snyder, Jim. "Keystone Builder's 2013 U.S. Lobbying Topped $1 Million." Bloomberg.com. January 22, 2014. Accessed February 1, 2015. http://www.bloomberg.com/news/articles/2014-01-22/keystone-builder-s-2013-u-s-lobbying-topped-1-million

[34]For more information on CCS, see: Won't carbon capture and sequestration (CCS) save us?

[35]Cambridge Energy Research Associates [25]

[36]Carbon Tracker Initiative [27]

carbon emissions would be spent by the late 2020s, several years before large-scale CCS can be expected to come online.[37]

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.[38] 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.[39] Storing carbon underground is risky — safe and permanent storage of cannot be guaranteed, and even very low leakage rates could undermine climate mitigation efforts.[40] 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 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 and a distraction.

Why fossil fuels are like tobacco

In 2007, McGill University decided to divest from tobacco companies, after determining that doing so was consistent with university policies. 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 seriousness of anthropogenic climate change has now progressed beyond the point where it can be considered a subject of ongoing academic inquiry and debate.

In the case of tobacco, the U niversity of Toronto considered it important that tobacco companies had undertaken a campaign to mislead the public and decision-makers about the dangerousness of their product. The 2007 Report of the Advisory Board on Tobacco Investment cites the argument that:

The University should not be part owner of an industry that “has deliberately set about to misinform the public” and “seeks to erode the very values that the University has vowed to protect”.[41]

The efforts of the fossil fuel industry to mislead the public and elected officials are documented in Naomi

[37] Carbon Tracker Initiative [28]
[38] Greenpeace [91]
[39] Nelder [158]
[40] Greenpeace [91]
[41] University of Toronto Advisory Board on Tobacco Investment [254], 5.

Oreskes' Merchants Of Doubt and James Hoggan's Climate Cover-Up .[42][43][44]' The conflicts between the actions of fossil fuel companies and the values of the university are documented throughout this brief, including the section on social injury.

Whether or not McGill University considered this point is not a matter of public record for the moment.

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 the top 200 fossil fuel companies to keep 80% of their reserves underground (with an estimated loss of $1.8 to 2.7 trillion CAD) . S hareholder activism is not a credible strategy for influencing companies worth $4.4 trillion to agree to renounce 40-60% of their value by keeping their reserves under ground.[45] In addition, shareholder voice has been tried unsuccessfully for decades (a reason the Rockefeller foundation gave for divesting), and in any case the university lacks the capability to effectively monitor compliance .

Third, tobacco products are distinct from other industries and can be argued to cause social harm because they have "no safe use." The CAMSR motion noted:

- tobacco ' s contribution to numerous adverse health conditions, both in smokers and in those exposed to second-hand smoke;

-the fact that there exists no safe use of tobacco and that it is a strongly addictive product;

-the economic burden resulting from health care costs and loss of productivity due to tobacco;

-the clear marketing of tobacco products towards youth, and particularly those of university age or even younger;

-the public health risk of fires caused by smoking;

Both anti-smoking advocates and major producers alike acknowledge tobacco's negative effects on human health. Similarly, environmentalists and scientists, along with spokespeople from the fossil fuel industry, have publicly conceded that the business of extracting and burning fossil fuels has multiple adverse effects on the ecological health of the planet as well as on global economic stability. 3 The risk of super-storms as well as forest fires increases dramatically the public health risks, disruption, and damage.

The era where there is such thing as a "safe use" of fossil fuels is over. Planet Earth is already locked in for .8 degrees of warming. Although world governments are aiming for a maximum increase of 2°, many, many

[42] Oreskes and Conway [167]

[43] Hoggan and Littlemore [103]

[44] Union of Concerned Scientists [237]

[45] The market capitalization of $4.4 trillion CAD comes from this Carbon Tracker report: Carbon Tracker. Unburnable Carbon 2013: Wasted Capital and Stranded Assets . 2013. http://www.carbontracker.org/report/wasted-capital-and-stranded-assets/ A risk of 40-60% of market capitalization comes from an HSBC report: "Unburnable Fuel" The Economist , May 4, 2013. http://www.economist.com/news/business/21577097-either-governments-are-not-serious-about-climate-change-or-fossil-fuel-firms-are

scientists agree that 2° is too much warming: every molecule of carbon from now on increases our risk.[46] Yet fossil fuel companies are doing everything in their power to make sure fossil fuels will still be used well into the future, well past even the 2° limit. They are marketing fossil fuels to our media and government decision-makers using phony statistics. ExxonMobil alone spends $110 million a day CAD exploring for new carbon.[47] The top 200 fossil fuel companies spend CAD $744 billion a year exploring for new fossil fuels.[48]

Like tobacco, the impact of climate change is already having numerous adverse health impacts—often on people who have contributed the least to climate change. As the US Department of Defense 2014 Defense Review states: "The pressures caused by climate change will influence resource competition while placing additional burdens on economies, societies, and governance institutions around the world. These effects are threat multipliers that will aggravate stressors abroad such as poverty, environmental degradation, political instability, and social tensions - conditions that can enable terrorist activity and other forms of violence."[49]

Nor should we forget the tremendous disruption that climate change would have on world order .

Fourth , both investments in tobacco and fossil fuels challenge pre-existing policies that were developed and implemented in alignment with the university's core values. For instance, the case for tobacco divestment was logical given that an anti-smoking policy was already implemented on campus. Although no local, provincial or federal legislation banned the production of cigarettes or the activity of smoking on a universal scale, the absence of such regulations did not deter the university from divestment. The same logic can be applied to the case for divesting from fossil fuels. For instance, the university's 2010 Sustainability Policy reflects the university's commitment: "McGill University aspires to achieve the highest possible standards of sustainability."[50] Divestment from fossil fuels is a legitimate action in recognition of the governmental and scientific consensus on the detrimental effects of fossil fuel extraction and consumption . Further, divestment aligns with the university's own position on promoting environmental health as stipulated in its Sustainability Policy, Vision2020, as well in its academic programming.[51]

In the absence of legislation banning the extraction or burning of fossil fuels, recognition of the adverse effects of these activities, legitimated through the enactment of Vision2020 and other university initiatives,

[46]From McKibben, 2012, Rolling Stone: "Any number much above one degree involves a gamble," writes Kerry Emanuel of MIT, a leading authority on hurricanes, "and the odds become less and less favorable as the temperature goes up." Thomas Lovejoy, once the World Bank's chief biodiversity adviser, puts it like this: "If we're seeing what we're seeing today at 0.8 degrees Celsius, two degrees is simply too much." NASA scientist James Hansen, the planet's most prominent climatologist, is even blunter: "The target that has been talked about in international negotiations for two degrees of warming is actually a prescription for long-term disaster." At the Copenhagen summit, a spokesman for small island nations warned that many would not survive a two-degree rise: "Some countries will flat-out disappear." When delegates from developing nations were warned that two degrees would represent a "suicide pact" for drought-stricken Africa, many of them started chanting, "One degree, one Africa."

[47]Carroll, Joe. "Exxon to Spend $100 Million a Day to Drill for Oil, Gas." Bloomberg.com. March 9, 2011. Accessed February 1, 2015. http://www.bloomberg.com/news/articles/2011-03-09/exxon-raises-capital-budget-to-as-much-as-37-billion-a-year-1-

[48]"Investors Challenge Fossil Fuel Companies." Ceres News. January 1, 2014. Accessed February 1, 2015. http://www.carbontracker.org/news/investors-challenge-fossil-fuel-companies/ .

[49]U.S. Department of Defense. "Quadrennial Defense Review." U.S. Department of Defense. January 1, 2014. Accessed February 1, 2015. http://www.defense.gov/pubs/2014_Quadrennial_Defense_Review.pdf

[50]See: http://www.mcgill.ca/secretariat/sites/mcgill.ca.secretariat/files/Sustainability-Policy.pdf

[51]Ibid.

~~constitutes a legitimate basis for divestment based on the precedent of the tobacco case. The university's~~ decision to divest from companies operating in apartheid South Africa shows that such action can be taken in the absence of official legislation that can be cited to validate claims of "social injury". In addition, the decision of a prominent and influential institution like McGill University may help encourage the emergence of such enabling legislation.

In the case of South Africa, within a year of the University of Toronto divesting the Ontario government passed Bill 9, An Act Permitting Trustees and other Persons to dispose of South African Investments . This legislation was tabled on November 5th 1987 and enacted in the Legislature of Ontario on December 15th 1988. However, the University of Toronto voted to divest from stocks in South African companies on January 21st 1988. This progressive action on the part of the university represents a forward-thinking response to the trajectory of social sentiment regarding the issue of apartheid, which was growing rapidly and was manifesting itself in policy changes and legislation such as Bill 9 .

Although no Canadian legislation currently exists limiting the extraction and burning of fossil fuels, which directly causes climate change, McGill University 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.

Social cost of carbon: McGill "owns" 7M in harm in Canada alone

Just the top 200 fossil fuel companies McGill invests in have $2.9 trillion in social cost in their fossil fuel reserves if we use U.S. government estimates. As a whole, the carbon owned by all the top 200 fossil fuel companies have a social cost of $23.5 trillion. By virtue of investing $11 million in shares in these just Canadian top 200 fossil fuel companies—and therefore by virtue of being a part owner—McGill University "owns" (in the form of carbon reserves) social harm worth $7.1 million in Canada alone.[52] McGill's Canadian investments alone as companies own a carbon social cost of $96 billion in their reserves. McGill is therefore in the tortuous position of needing $2.9 trillion in social costs ($96 billion in Canada of which it owns $7 million) to be inflicted on the world in order to maintain the health of its endowment. If the spectre of climate change were avoided, on the other hand, with its current investments McGill would lose from $2.8 to 4.3 million in its Canadian fossil fuel investments alone, according to HSBC's estimates.[53] Although social cost numbers abstract away from the suffering of climate change, they make it clear that McGill University's investments collude in the injustice of climate change.

[52]This is based on an application of U.S. Environmental Protection Agency social cost of carbon numbers ($39 USD) at the 2014 annual exchange rate. The top 200 fossil fuel companies and their carbon reserves are available in . McGIll's ownership is divided by the number of shares outstanding times the TSX share price on Dec. 31st, 2014.

[53]A risk of 40-60% of market capitalization if climate change is stopped comes from an HSBC report: http://www.economist.com/news/business/21577097-either-governments-are-not-serious-about-climate-change-or-fossil-fuel-firms-are

Moreover, the social cost of carbon rises every day meaning that the harm of McGill's investments rise too. By 2020, the social cost of carbon estimate per tonne rises to $51 and McGill's portion of harm in Canada alone (barring any other changes) would rise to $8.5 million. By 2050, the estimate is $84. Any profits that McGill could hope to gain from these risky investments would therefore be offset by McGill's increasing share of social cost imposed on the world.

The United States EPA places the social cost of carbon at $43 CAD a metric tonne in 2015 but admits this could be realistically be as high as $116.[54]

Many organizations have attempted to quantify the "social cost of carbon" — the amount of damage done to third parties by emitting one tonne of CO 2e . For instance, the U.S. Department of Energy recently increased its estimate from $22 per tonne to $36.[55] ,[56] ,[57] ,[58] In the United Kingdom, the government has been using a "shadow cost" of carbon to estimate social harm since 2007.[59] 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 equivalent in 2000.[60]

In various jurisdictions policies have been considered or implemented which were meant to internalize the social costs of fossil fuel use.[61] In a 2013 study, the World Bank concluded that "[r]egional, national and sub-national carbon pricing initiatives are proliferating", with systems implemented in California, Quebec, Switzerland, the European Union, Kazakhstan, Tokyo, Australia, and New Zealand.[62] 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".[63]

In Canada, the NRTEE repeatedly argued in favour of putting a price on GHG pollution in order to reflect the

[54]"The Social Cost of Carbon." United States Environmental Protection Agency. Accessed February 1, 2015. http://www.epa.gov/climatechange/EPAactivities/economics/scc.html .

[55]Plumer [175]

[56]Henn [100]

[57]Wald [259]

[58]Stastna [204]

[59]Price, Thornton, and Nelson [178]

[60]Stern [206]

[61]Forthcoming work by Hamish van der Ven at McGill University will provide a comparative analysis of climate change policies adopted in ten Canadian provinces, including the broad-based carbon tax implemented in British Columbia in 2008 and the credit-based trading system implemented in Alberta in 2007.

[62]The World Bank [226], 11.

[63]The World Bank [226], 12-13.

~~harm it does to society.~~[64] ,[65] ,[66] ~~In a 2012 report, they highlighted the costs of delaying the implementation~~ of a price on carbon:

The NRT analysis for Environment Canada reinforces a central conclusion of all our work and many other independent sources: delay is costly. Put directly, time is money. The closer the target date approaches, the higher the carbon prices will have to be to incent investment in capital stock turnover, develop and deploy and new technologies, and change firm and household energy-use behaviour.[67]

"Finding the right price signal", they conclude, "is key".[68]

As pointed out by Peter Foster, determining the appropriate social price of is made more complicated by the need to somehow incorporate the worst-case scenarios associated with global climate change.[69] For instance, if we add enough 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. The social cost of carbon demonstrates that fossil fuel companies are harming our world and refusing to reimburse society for their share of the damage.

A culture of social injury also justifies divesting

An independent study conducted by McGill undergraduate student as part of the the Environment 401 course examined divestment from fossil fuels at McGill university. The research seeked to answer the following question :

I s there a financial basis and ethical evidence of social injury, as defined by Committee Advising on Matters of Social Responsibility, to justify the divestment of McGill's endowment fund from the fossil fuel industry?

The researchers used web searches, legal databases searches, NGO reports, scientific articles as well as government communication order to establish whether there was any evidence that fossil fuel corporations in McGill Endowment had committed social injury. The result of their research is a dossier, detailing cases of social injury, organized alphabetically by corporation name.

Our research indicates that more than 90% of the companies involved in the fossil fuel industry, in which McGill is invested, have committed social injury. It is important to note that the team considers a corporation to have committed social injury if the team believed that evidence found fit within the CAMSR

[64] National Round Table on the Environment and the Economy [152]
[65] National Round Table on the Environment and the Economy [152]
[66] National Round Table on the Environment and the Economy [154], 18.
[67] National Round Table on the Environment and the Economy [154], 114.
[68] National Round Table on the Environment and the Economy [154], 117.
[69] Foster [66]

definition of social injury. However it will up to CAMSR to ultimately decide what exactly constitutes social injury.

. . .

Out of sixty-one corporations, the team was able to gather legal information pertaining to social injury for fifty-two of them. Legal evidence of social injury, as defined by the research group (based on the definition in CAMSR's terms of reference), includes types of cases where the companies settled or were found guilty. As part of this legal evidence, we also included allegations, by NGOs, of human rights abuses against groups such as Indigenous peoples or ethnic minorities in developing countries. In terms of legal evidence, the team found 103 different cases; this is an approximate average of two cases per corporation. The number of cases varies depending on whether cases pertain to more than one corporation, and whether they are counted once total or once for each corporation they involve. The figure given is an estimate of the number of cases counted only once. Another type of evidence that was gathered were individual instances of pollutant release. This data was gathered for twelve corporations, and there was an average of 231 separate pollutant release instances per corporation. To fully grasp what each type of case translates to, in terms of ethical breach or environmental degradation, it is important to use demonstrative examples of the various types of cases investigated. Although no two cases are the same, they fall into broad categories. There are seven main type of cases: environmental degradation, securities fraud, bribery cases, health and accidents lawsuits, workers' rights and safety, human rights abuse, and human rights abuse allegations by NGOs. Each type of case encompasses different scales, different scenarios, and varying degrees of social injury. However, this research group holds that they are all valid evidence of social injury .[70]

That an undergraduate research group, not trained in the workings of legal research nor in the investigative process was able to find so much evidence in a semester speaks volumes. The evidence presented in the ENVR 401 report is overwhelming and regardless of the other arguments made in this brief, it should be closely examined. Due to all these factors Divest McGill holds that there is a culture of social injury within the fossil fuel industry justifying divestment.

Fossil fuel and behaviour regarding legislation

Fossil fuel companies violate Canadian domestic law, and benefit from widespread government failure to enforce regulations

Numerous examples exist of infractions of environmental regulations by fossil fuel corporations. Courts have further set a clear legal precedent for the consideration of contribution to climate change in environmental assessments. However, the infractions that have been tried in court are greatly outnumbered by those that remain unaddressed. Civilians, First Nations groups, and environmental organizations have successfully

[70]Entire report and data available here: https://drive.google.com/drive/#folders/0B-qq0H5AQlbPVEJXbFgwMVpiUVE

sued the Canadian federal and provincial governments in response to ongoing complicity with the illegal activities of fossil fuel corporations. Inconsistent enforcement of constitutional, federal, and provincial law by the government has promoted the violation and frustration of these laws by fossil fuel corporations. Thus, while this brief presents clear legal evidence of illegal activities undertaken by fossil fuel corporations, it also reinforces that the extent of such activities is not accurately reflected by these cases alone.

Fossil Fuel Corporations Have a Clear History of Legal Infractions

Courts have challenged corporations for their failure to adequately address the environmental effects of their projects. I n 2008 the Federal Court of Canada considered the case brought forward by the Pembina Institute that the environmental assessment conducted on Imperial Oil's Kearle project in the oil sands had been flawed and not taken climate change sufficiently into account.[71] The court found Imperial Oil's claim that "the adverse environmental effects of the greenhouse gas emissions of the Project would be insignificant" to be flawed, noting that:

According to Imperial Oil's EIA [Environmental Impact Assessment], the Project will be responsible for average emissions of 3.7 million tonnes of carbon dioxide equivalent per year, which equals the annual greenhouse gas emissions of 800,000 passenger vehicles in Canada, and will contribute 0.51% and 1.7% respectively, of Canada and Alberta's annual greenhouse gas emissions (based on 2002 data).[72]

The court ordered limited action, calling for the matter to be remitted back to the panel which initially approved the project and directing them to "provide a rationale for its conclusion that the proposed mitigation measures will reduce the potentially adverse effects of the Project's greenhouse gas emissions to a level of insignificance".[73] In 2009, Imperial Oil announced the $8 billion first phase of the Kearl Oil Sands project, producing 110,000 barrels a day of bitumen.[74] The company also announced plans to expand the project in two further phases, eventually bringing up production to 300,000 barrels per day. Nonetheless, the precedent supports the view that there is some legal obligation to consider GHG pollution in the environmental assessment process, and some onus on the proponents of a project to present and justify mitigation measures.

Additionally, courts have found fossil fuel corporations responsible for the release of harmful substances into the environment.. In R. vs. Syncrude Canada, in 2010, Syncrude Canada was found guilty of a provincial charge of failing to prevent a toxic substance from harming wildlife, and a federal one of depositing a substance harmful to migratory birds , resulting in the death of 1,606 birds in its tailings ponds in Alberta in 2008. The company settled, paying a $3 million fine. Throughout the trial, the Crown argued that Syncrude failed to deploy its cannons, effigies and other deterrents - meant to scare migratory birds off of its 12-square-kilometre tailings pond - quickly enough, leading to the birds' deaths in the toxic pond, which

[71] Gerrard et al. [71], 116.
[72] Federal Court of Canada [60]
[73] Federal Court of Canada [60]
[74] Imperial Oil Ltd. [107]

contains oily bitumen byproduct.[75][76]

Similarly, In June 2012, Shell Canada was found guilty of violating the Fisheries Act , by spilling 12,500 litres of a chemical solution known to be harmful to fish into the Peace River in August of 2009. This river supports First Nations subsistence fishing, and is known to be home to several species of rare fish. Shell was fined $225,000[77] . A year earlier, Imperial Oil was fined $185,000 for a similar violation relating to a release of a hazardous chemical substance into the Mackenzie River in 2009.

In December 2013, North Atlantic Refining Limited was also found guilty of violating the Fisheries Act , and ordered to pay a $100,000 fine. The company was found to be the source of diesel fuel that had been released from storm sewers into Powers Pond in Mount Pearl, Newfoundland and Labrador.[78]

Currently, Shell Canada is being sued by Ontario's Ministry of Environment and Climate Change for an incident occurring in January of 2013 at its Corunna plant. The charge alleges: "Shell Canada did commit the offence of discharging, or causing, or permitting a discharge of a contaminant into the natural environment that caused or was likely to have caused an adverse effect, contrary to the Environmental Protection Act."[79]

The Canadian government fails to uphold the right to First Nations consultation

While these court cases clearly indicate an industry-wide history of violation of environmental laws, to the detriment of the public and the environment, they might seem to indicate that environmental legislation is stringent, and is being upheld effectively in Canada. In fact, a tremendous number of victories in court cases under taken by First Nations groups against provincial governments and the federal governments reveal the government's complicity in failing to uphold and adequately enforce existing legislation.

In June 2013, the Lac La Biche-area Cree won a case at the Court of Appeal of Alberta allowing them to proceed with a lawsuit against the Canadian federal government and the Government of Alberta. The Cree allege that the cumulative impacts of 300 operating oil sands projects impact their rights to hunt and fish under Treaty 6.[80] 560,000 barrels of oil per day are being extracted from the territory in question — 30 percent of the total output from the oil sands. Future projects that have been announced would increase that total to 1.6 million barrels per day.

In December 2014, the Federal Court of Canada found that the Crown had failed to consult the Mikisew Cree

[75]Wingrove, Josh. "Syncrude to Pay $3M for Duck Deaths." The Globe and Mail. October 22, 2010. Accessed February 1, 2015. http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/syncrude-to-pay-3m-for-duck-deaths/article4085700/

[76]R. v. Syncrude Canada Ltd., 2010 ABPC 229

[77]"Shell Canada Ltd. Is Fined $225,000 after Pleading Guilty to Federal Charges Laid by Environment Canada." Government of Canada, Environment Canada. June 12, 2012. Accessed February 1, 2015. http://www.ec.gc.ca/alef-ewe/default.asp?lang=En&n=B37731A1-1

[78]Ibid.

[79]"Shell Canada Facing Environmental Charges." Sarnia Observer. January 7, 2015. Accessed February 1, 2015. http://www.theobserver.ca/2015/01/07/shell-to-appear-feb-13-in-sarnia-court

[80]Tait and Cryderman [212]

First Nation prior to the introduction of bills Omnibus C-38 and Omnibus C-45 into Parliament. Instead, despite the potential for adverse impacts on the Mikisew Cree, the Court noted the bills "went through Parliament with remarkable speed."[81] Despite the Court's refusal to enforce the consultation, since the bills have since passed into law, the ruling sets a remarkable precedent for First Nations groups to legally uphold their right to be consulted upon the introduction of legislation into Parliament that may adversely impact them.

In June 2014, the Supreme Court of Canada ruled that the Tsilhqot'in First Nation had claim to land outside of its reserve, granting them right to determine " the uses to which the land is put and to enjoy its economic fruits ."[82] According to a review of the case:

The Court makes a brief statement at paragraph 92 to say that projects might need to be cancelled if they begin without Aboriginal consent, title is later proven and continuing the project would be "unjustifiably infringing". Similarly, the Court states at paragraph 86 that "incursions on Aboriginal title cannot be justified if they would substantially deprive future generations of the benefit of the land".[83]

The ruling sets an important precedent for indigenous groups to reassert their legal rights over unceded land, particularly in British Columbia, Quebec, and the East Coast. Critically, the decision states that the duty to consult exists even if a land claim is underway. This decision has enormous implications for the approval processes of future extraction and pipeline projects, and will further entrench the right to consultation of First Nations groups.

A large wave of legal victories for First Nations groups across the nation - over 150 in recent years according to some legal experts[84] - has repeatedly upheld their right to consultation, and reinforced the failure of the Canadian government to enforce this legal right. The influence of the fossil fuel lobby, such as in the passage of the Omnibus bills (see:) has resulted in the direct infringement of the right to consultation for First Nations. These victories mark an important precedent for legal proceedings against fossil fuel corporations, and against the federal and provincial governments, whose close ties to these industries has resulted in a failure to enforce what environmental legislation does exist.

The activities of the fossil fuels industry in Canada directly violate the constitutional and treaty rights of Canada's First Nations, Metis, and Inuit peoples. These violations arise both from the specific impact of fossil fuel development projects — such as the oil sands — and from the inevitable consequences of burning fossil fuels. Rights that are being violated include the right to consultation and accommodation; the right to fish, hunt, and trap; and the aboriginal rights affirmed in Canada's constitution. Keepers of the Athabasca

[81] Brooks, Karey, and Estella Charleson. "Legislative Changes to Federal Environmental Laws - Duty to Consult Triggered | JFK Law | Canada." JFK Law. January 18, 2015. Accessed February 1, 2015. http://www.jfklaw.ca/legislative-changes-to-federal-environmental-laws-duty-to-consult-triggered/

[82] Supreme Court of British Columbia [211]

[83] Junger, Robin M., Joan M. Young, Brittnee Russell, and Brent Ryan. "Supreme Court Declares Aboriginal Title in Tsilhqot'in Nation v. British Columbia." Aboriginal Law Bulletin. June 1, 2014. Accessed February 1, 2015. http://www.mcmillan.ca/Supreme-Court-declares-Aboriginal-title-in-Tsilhqotin-Nation-v-British-Columbia .

[84] Gallagher, Bill. Resource Rulers: Fortune and Folly on Canada's Road to Resources . Waterloo, Ont.: Bill Gallagher, 2012.

member Vivienne Beisel explain how the oil sands development has violated Treaty 8 and the constitution:

The cumulative impacts of oil sands development has all but destroyed the traditional livelihood of First Nations in northern Athabasca watershed. The law is clear that First Nations must be consulted whenever the province contemplates action that may negatively affect Aboriginal and treaty rights... The province has continued to issue approvals for new developments without obtaining their consent or consulting with First Nations in a meaningful and substantial way. This is in direct breach of Treaty 8 First Nations' treaty-protected Aboriginal rights to livelihood, and thus a violation of s.35(1) of the Constitution.[85]

The Canadian Government Fails to Enforce Environmental Legislation

The failure of the Canadian government to uphold the right to consultation is mirrored by its failure to enforce what environmental legislation exists. A comprehensive analysis of environmental incidents associated with the oil sands demonstrates how numerous violations of environmental regulations have been since 1996, as well as how rarely they have led to enforcement action. In a peer-reviewed report prepared for Treeline Ecological Research and Global Forest Watch Canada, Kevin Timoney and Peter Lee found that over 4,000 alleged contraventions of regulations took place in Canada's oil sands between 1996 and 2012.[86][87][88] Syncrude's Mildred Lake operation and Suncor were collectively responsible for 86.6 percent of these contraventions.[89] During the time period under consideration, Alberta's environment ministry only took action to enforce regulation in 37 cases, representing 0.9 percent of the total. In cases where enforcement action was taken, the mean penalty was $4,500 .

A study conducted by Global News found that Alberta experienced 28,666 crude oil spills between 1975 and 2012.[90] This figure excludes spills from pipelines that cross provincial or national borders. The study found that Alberta's Energy Resources Conservation Board (ERCB) has been conducting a decreasing number of field inspections and finding more cases of "high-risk noncompliance": a figure that rose from 263 in 2010 to 437 in 2011. Out of 362 drilling operations inspected, 41 were found to be "high-risk noncompliant".[91] According to the ERCB, Alberta experienced 700 crude oil and bitumen spills in 2012.[92] The Canadian Natural Resources Ltd. Wolf Lake central treating facility has experienced 157 spills in the past 37 years.[93] Imperial Oil Resources, Canadian Natural Resources Ltd., Husky Oil Operations Ltd., BP Canada Energy Company, the Encana Corporation, and Penn West Petroleum Ltd. have all experienced more than 1,000 oil spills since 1975: with total volumes ranging from 20,474 cubic metres to 79,505 cubic metres.[94]

[85] Keepers of the Athabasca [123]
[86] Timoney and Lee [230], 8.
[87] Young [273]
[88] The Canadian Press [213]
[89] Timoney and Lee [230], 8.
[90] Young [273]
[91] Young and Paperny [274]
[92] Young and Paperny [274]
[93] Young and Paperny [274]
[94] Young and Paperny [274]

Figure 7.1:

In a 2010 study by a Royal Society of Canada Expert Panel, it was concluded that "[r]eclamation [of land] is not keeping pace with the rate of land disturbance" and that "[c]urrent practices for obtaining financial security for reclamation leave Albertans vulnerable to major financial risks".[95] The study identifies that: "increasing direct GHG emissions from growing bitumen production creates a major challenge for Canada to meet our international commitments for overall GHG emission reduction that current technology options do not resolve".[96] The study also finds major defects with environmental regulatory performance in Canada and Alberta. It states that:

The environmental regulatory capacity of the Alberta and Canadian Governments does not appear to have kept pace with the rapid growth of the oil sands industry over the past decade. The EIA [Environmental Impact Assessment] process relied upon by decision-makers to determine whether proposed oil sands projects are in the public interest has serious deficiencies in relation to international best practice. Environmental data access for cumulative impact assessment needs to improve.[97]

This failure to enforce environmental regulation was further exemplified in the federal environmental commissioner's audit of the National Energy Board (NEB). The report found that the National Energy Board had been failing to follow up on identified deficiencies in the transport of dangerous products, that oversight of emergency procedures manuals was deficient, and that improvements were needed in implementing a risk-based monitoring approach.[98] The report found that although 64% of compliance activities identified " multiple gaps and deficiencies with regulated companies' systems and processes designed to ensure safety, pipeline integrity, and protection of the environment," in 93% of these cases the NEB failed to follow up with companies to determine whether these gaps had been addressed.[99]

Each of these represents a substantial case of the business activities of fossil fuel companies frustrating the enforcement of domestic law and regulations intended to protect individuals against deprivation of health, safety, and basic freedoms.

It is apparent that not only do fossil fuel corporations benefit from this failure to enforce environmental regulations, but that ongoing extraction is dependent on it. Environment canada's own study clearly linked tar sands development in Alberta to the increased presence of polycyclic aromatic hydrocarbons (PAHs, persistent environmental contaminants, in the environment[100] . Yet despite proven health risks linked to the tar sands, Canada's unwillingness to allow the Commission for Environmental Cooperation (CEC) to investigate whether tailings ponds were leaking in northern Alberta further highlights the government's

[95]The Royal Society of Canada Expert Panel [224], 5.

[96]The Royal Society of Canada Expert Panel [224], 5.

[97]The Royal Society of Canada Expert Panel [224], 5.

[98]British Columbia Commissioner of the Environment and Sustainable Development [18], 21-26.

[99]"2011 December Report of the Commissioner of the Environment and Sustainable Development." Government of Canada, Office of the Auditor General of Canada. December 1, 2011. Accessed February 1, 2015. http://www.oag-bvg.gc.ca/internet/English/parl_cesd_201112_01_e_36029.html#hd4b .

[100]Kurek, Joshua, Jane Kirk, Derek Muir, Xiaowa Wang, Marlene Evans, and John Smol. "Legacy of a Half Century of Athabasca Oil Sands Development Recorded by Lake Ecosystems." Proceedings of the National Academy of Sciences of the United States of America. November 19, 2012. Accessed February 1, 2015. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3562817/ .

allegiance to fossil fuel corporations over citizens. The CEC was founded to make sure that governments follow their own environmental laws, but the government has aggressively rejected all efforts by the watchdog commission to investigate breaches of Canadian environmental law[101] .

The links between the failure of the federal and provincial governments to enforce environmental legislation and the close ties of the fossil fuel industries to these governments can clearly be made. Despite clear and ongoing violations of Canadian environmental legislation, a widespread culture of nonenforcement and a willingness to defend these corporations is evident.

Broader Legal Concerns

Quebec's Environmental Quality Act of 1977 is the strongest bill of rights for the environment in Canada, one that should particularly influence McGill's values.

Every person has a right to a healthy environment and to its protection, and to the protection of the living species inhabiting it, to the extent provided for by this Act and the regulations, orders, approvals and authorizations issued under any section of this Act and, as regards odours resulting from agricultural activities, to the extent prescribed by any standard originating from the exercise of the powers provided for in subparagraph 4 of the second paragraph of section 113 of the Act respecting land use planning and development (chapter A-19.1).[102]

Through numerous mechanisms described in this brief, the activities of fossil fuel companies undermine the integrity and sustainability of the environment, along with the right of the population of Quebec to a healthful environment. GHG pollution poses an unreasonable threat to the integrity of the environment, while threatening biodiversity and the ability of Quebec to manage natural resources wisely and protect sensitive areas. The Act further specifies: "A judge of the Superior Court may grant an injunction to prohibit any act or operation which interferes or might interfere with the exercise of [these] right[s]".[103]

Environmental laws in Canada's other provinces recognize and seek to protect the same right to a healthy environment. For example, the 1993 Ontario Environmental Bill of Rights recognizes the "inherent value of the natural environment" and states that "the people of Ontario have the right to a healthful environment" and "have as a common goal the protection, conservation and restoration of the natural environment for the benefit of present and future generations".[104]

The Yukon Environment Act states that: "The people of the Yukon have the right to a healthful natural environment".[105] Among its objectives, the act also seeks: "to ensure the maintenance of essential ecological processes and the preservation of biological diversity", "to ensure comprehensive and integrated consideration

[101] McDiarmid, Margo. "NAFTA Probe of Alberta's Tailings Ponds Blocked by Canada." CBC News. January 28, 2015. Accessed February 1, 2015. http://www.cbc.ca/news/politics/nafta-probe-of-alberta-s-tailings-ponds-blocked-by-canada-1.2935004 .

[102] Government of Quebec. Division VI §1 "Climate change action plan." In Environment Quality Act 2015.

[103] Government of Quebec [84]

[104] Government of Ontario [83]

[105] Government of Yukon [88], 14.

of environmental and socioeconomic effects in public policy making in the Yukon", and "to fully use the knowledge and experience of Yukon residents in formulating public policy on the environment".[106]

Similarly, the Northwest Territories Environmental Rights Act recognizes that "the people of the Northwest Territories have the right to a healthy environment and a right to protect the integrity, biological diversity and productivity of the ecosystems in the Northwest Territories" and establishes the means by which individuals can act to protect the environment from harm.[107]

Companies that extract fossil fuels undermine the right to a healthy environment that this act endeavours to protect. Because of the general failure to deal with climate change effectively in Canada, these objectives are being frustrated. The failure of fossil fuel corporations to prevent pipeline spills, and the failure of the federal government to properly enforce environmental regulation, constitute a breach of these provincial policies.

Over and above violations of specific pieces of legislation, climate change represents a massive example of 'nuisance' as defined in Canadian tort law. Under the common law in Canada "a landowner's right to use and enjoy his property doesn't give him the right to engage in activities that interfere with the rights of neighbours to use and enjoy their own properties".[108] That is to say, the fact that fossil fuel companies own the land and mineral rights in the areas where they are operating does not mean they have the right to impose extreme weather, rising sea levels, and other well-understood climate change harms on other landowners across Canada. This principle is also incorporated into the bylaws of many Canadian jurisdictions. For instance, the town of Musgrave, Nova Scotia has a nuisance bylaw stating: "No person shall cause, suffer or allow to be discharged or emitted from any fuel burning equipment, internal combustion engine, vehicle or outside open fire any smoke, dust, fly-ash, soot or fumes or other solid or gaseous product or combustion to an extent which is detrimental to the property of any other person".[109] Nuisances are also regulated under provincial and territorial law.

At the highest level, the activities of fossil fuel companies risk undermining the Canadian Charter of Rights and Freedoms . Section 7 states: "the right to life, liberty and security of the person and the right not to be deprived thereof except in accordance with the principles of fundamental justice".[110] The harms associated with climate change are predicted to become so substantial as to deprive people of these rights. In particular, this is most true for particularly vulnerable populations and communities within Canada, such as small northern settlements. Settlements built on permafrost could become too dangerous to inhabit, as those dependent on ice roads for supplies could become too isolated to be economically viable. Further, if the sea level rise projections discussed in prove justified, the security of the person and lives of many people across Canada could be threatened.

[106] Government of Yukon [88], 13.
[107] Government of the Northwest Territories [85]
[108] Environmental Compliance Insider [55]
[109] Environmental Compliance Insider [55]
[110] Government of Canada [79]

In the U.S. fossil fuel companies subvert and violate environment law

The recent revelation that the oilfield services company Halliburton destroyed evidence related to the 2010 Gulf of Mexico oil spill clearly shows the frustration of the enforcement of law within the United States.[111] Halliburton provided cementing services to BP, intended to help seal the well. They advised BP that 21 'centralizer' devices should have been installed, to improve cementing, but BP chose to install only six . After the disaster, "Halliburton ordered workers to destroy computer simulations that showed little difference between using six and 21 centralizers".[112] The disaster caused by the well blowout caused 11 deaths, along with substantial amounts of environmental and economic damage in the region.

In September 2014, British Petroleum employees were found to have acted "recklessly" in their failure to conduct proper tests on the Deepwater Horizon oil rig that caused the 2010 spill. While the size of the fine is still being determined in courts, the company faces a maximum penalty of $13.7 billion.[113]

While numerous other examples exist of actual violations of law by companies within the United States, fossil fuel corporations have also been decisively linked to attempts to weaken enforcement of existing environmental legislation. An investigation by the New York Times found that "attorneys general in at least a dozen states are working with energy companies and other corporate interests, which in turn are providing them with record amounts of money for their political campaigns, including at least $16 million this year."[114] These attorney generals have subsequently promoted industry-approved legislation, undermined federal attempts to enforce regulation, and shut down investigations into these corporations.[115] These industries have also lobbied to undermine the EPA's regulatory power through the promotion of federal cuts to the EPA's budget, as well as the introduction of model bills that would give states power to block federal environmental standards.[116] It is clear that these corporations are acting in ways that frustrate the enforcement of domestic law intended to protect individuals against deprivation of health, safety, or basic freedoms, or to protect the natural environment.

International law

The activities of the fossil fuels companies in which McGill University invests also frustrate international law. First, the Universal Declaration of Human Rights states that: "Everyone has the right to life, liberty

[111] Reuters [182]

[112] Reuters [182]

[113] Rushe, Dominic. "Deepwater Horizon Oil Spill Legal Saga Enters Final Chapter - Maybe." The Guardian. January 19, 2015. Accessed February 1, 2015. http://www.theguardian.com/business/2015/jan/19/bp-oil-spill-deepwater-horizon-final-fine-clean-water-act .

[114] Lipton, Eric. "Energy Firms in Secretive Alliance With Attorneys General." The New York Times. December 6, 2014. Accessed February 1, 2015. http://www.nytimes.com/2014/12/07/us/politics/energy-firms-in-secretive-alliance-with-attorneys-general.html

[115] Ibid.

[116] Hamburger, Tom. "Fossil-fuel Lobbyists, Bolstered by GOP Wins, Work to Curb Environmental Rules." Washington Post. December 7, 2014. Accessed February 1, 2015. http://www.washingtonpost.com/politics/fossil-fuel-lobbyists-bolstered-by-gop-wins-work-to-curb-environmental-rules/2014/12/07/3ef05bc0-79b9-11e4-9a27-6fdbc612bff8_story.html .

and security of person".[117] 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 , to which Canada is a signatory, 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".[118] By signing this declaration, Canada recognized the threat to human life posed by climate change and pledged to take measures to address that threat. 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 $^\circ$ 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 .[119] 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 "Shell's continuing history of social injury"— 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 Canada 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".[120] Countries including Canada have since adopted a threshold of 2 $^\circ$ C of global temperature increase above pre-industrial levels as constituting 'dangerous' climate change. 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. It is unsurprising that fossil fuel companies vigorously oppose these types of actions.

[117] United Nations General Assembly [243]

[118] 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 1989.

[119] International Labour Organization [117]

[120] Parties to the United Nations Framework Convention on Climate Change [169], 4.

Rather than fulfilling its commitment to meet the 2° C threshold, the Government of Canada has bowed to industry interests, working intently to reduce the environmental oversight to which the oil sands are subjected, while aggressively promoting pipelines and other projects to increase the export capacity of the oil sands.[121][122] The Canadian government has gone so far as to advertise on behalf of these corporations, spending millions of dollars on a "Go with Canada" advertising campaign trying to encourage the approval of the Keystone XL pipeline by the U.S. government.[123][124] The federal government is also spending $120 million on studies to facilitate the construction of the proposed Northern Gateway pipeline, intended to export diluted bitumen from the oil sands via British Columbia.[125] Fossil fuel corporations' success in obtaining government approval of these projects has resulted in the direct violation of Canada's international commitments as a signatory of the UNFCCC.

The political influence of fossil fuel corporations in Canada has pushed the federal government to adopt obstructionist tactics at international climate change negotiations. For example, Canada has repeatedly been 'awarded' the satirical 'Fossil of the Year' award for obstructing negotiations at the Conferences of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC).[126][127] At the Copenhagen COP in 2009, a coalition of environmental groups declared Canada "the absolute worst country at the talks".[128] A Polaris Institute report directly linked the fossil fuel industry to the Canadian delegation's tactics: "In the months preceding COP 15 in Copenhagen in December 2009, Canada's chief climate change negotiator Michael Martin had over 20 meetings with CAPP, other oil and gas industry associations and individual oil companies".[129] Many countries questioned the appropriateness of Canada's frequent argument that it would not take more substantial action on the issue until "all major emitters" agree d to do likewise, despite the wide discrepancy between the historical and per-capita emissions of Canada and those of states like India.[130]

Despite ratifying the Kyoto Protocol in 2002, the Government of Canada never developed an adequate plan to achieve the target it chose for itself: a reduction in GHG pollution to 6 percent below 1990 levels by 2012. Contrary to the government's objectives, Canadian emissions increased by 24.1 percent between 1990 and 2008.[131] " One of the main reasons for the increase has been the growth in exports of petroleum, natural gas, and forest products. These commodities are exported, but the GHG emissions resulting from their production are not," reports the Conference Board of Canada.[132] The expansion of the fossil fuel industry,

[121] See: Smith [202]
[122] Harper [97]
[123] Hallegatte et al. [93]
[124] De Souza [46]
[125] Meissner [144]
[126] Climate Action Network Canada [36]
[127] Simpson [200]
[128] CBC News [29]
[129] Fernandes, Sabrina, and Richard Girard. "Corporations, Climate and the United Nations: How Big Business Has Seized Control of Global Climate Negotiations." Polaris Institute. November 1, 2011. Accessed February 1, 2015. https://d3n8a8pro7vhmx.cloudfront.net/polarisinstitute/pages/31/attachments/original/1411065499/CorporationsClimateandtheUN.pdf?1411065499) .
[130] McCarthy [136]
[131] United Nations Framework Convention on Climate Change [242], 3.
[132] "GHG Emissions." The Conference Board of Canada. January 1, 2013 http://www.conferenceboard.ca/hcp/details/environment/greenhouse-

and the resulting increase in emissions, frustrated the objectives of the UNFCCC and Kyoto Protocol both directly and indirectly. It did so directly because Canada failed to reduce emissions as promised. It also did so indirectly insofar a s Canadian inaction was interpreted by countries around the world as evidence of Canada's lack of seriousness about confronting the problem of climate change, which could be used to justify inaction on the part of other countries. The Canadian government's actions, as demonstrated earlier, were in part a response to the powerful influence of the fossil fuel lobby and in spite of the wishes of the majority of Canadians.[133]

gas-emissions.aspx

[133] E.g. http://www.theglobeandmail.com/report-on-business/canadians-want-harper-government-to-take-leadership-role-on-climate-change-poll-says/article15281917/

Point 4: Divestment is financially viable and the only effective shareholder action

Divestment is financially viable

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 McGill University.

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".[1] 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."[2] Discussing Canada specifically, they explain: "the power of investment is undertaken in a prudent manner when adequate processes (including completion of studies of the nature and quality of a proposed investment in light of the plan's total assets and obligations) have been followed and salient information (including expert opinions) has been considered".[3] In the same report, they claim: "Climate

[1] United Nations Environment Programme [239], 6.
[2] United Nations Environment Programme [239], 6.
[3] United Nations Environment Programme [239], 51.

change is an obvious example of an environmental consideration that is recognised as affecting value".[4] As this brief explains in detail, the beneficiaries and purposes of the McGill University '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 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".[5] 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".

Students showed these companies underperform in McGill's endowment

McGill students found that the hidden, social cost of the fossil fuel companies in McGill's endowment was equivalent to 18% of their value. This is an extraordinary number. This was calculated in the following way: the dollar value of fossil fuel companies listed in holdings above $500,000 have a total value of $33, 929, 293 CAD while the total value of direct holdings above $500,000 in the endowment is $212,750,896. These same fossil fuel companies total 144,124 tons of CO 2 E, or a social cost of $6,197,332 CAD according to the EPA's social cost of carbon. But since this is only a subsection of the endowment, the real cost is much higher. Nor is this the shadow cost of the company as a whole but only the portion McGill owns.

Further, their results showed that 12 Canadian Companies in the fossil fuel industry in which McGill invests more than $500,000 score below the endowment fund's average. There are also two Canadian companies in which the McGill endowment fund invests under $500, 000 that score below the endowment funds average. Regarding U.S. investment there are two U.S. companies in which the McGill endowment fund invests over $500, 000 that score below the fund's average. There are also eight U.S. companies in which the Board of Directors invest less than $500,000 that score below the average of the endowment fund.

Six researchers submitted a report for McGill's Environmental Research course on December 7 th , 2014. The report analyzed the possible financial and socially injurious effects of McGill's endowment fund in the fossil fuel industry. First, the researchers determined whether the fossil fuel companies in McGill's endowment are sound investments compared to possible alternatives. Three standard financial metrics were used to quantifiably value these companies in relation to the rest of McGill's endowment. These metrics were the

[4] United Nations Environment Programme [239], 11.
[5] International Energy Agency [115]

Price/Earnings Ratio, Relative Graham Value, and Debt/Equity Ratio, which are arguably the three most accurate and widely utilized financing techniques of investors.

In effect the Board of Directors invest McGill's endowment fund in 24 companies of the fossil fuel industry that underperform in relation to the average investment of McGill's endowment. The results show that the Board of Directors are not maximizing the returns of McGill's investments, and thus may not be satisfying their fiduciary duties in the most fiscally prudent manner. The report concluded that investment in these fossil fuel companies increase risk and volatility for the overall endowment. The report recommended reallocating these funds in more financial sound investments.

There is no evidence of a divestment penalty for investors

Reports from three universities that have divested—one with 13% invested in fossil fuels—have seen increases in their endowment since divesting.[6]

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

As the City of Seattle considers divesting from the top 200 fossil fuel companies, they commissioned a study to look at the feasibility of doing so. Part of the report read, "From a performance perspective, the S&P 500 screened against the CU200 [the CU200 being the top 200 fossil fuel companies] outperforms the standard S&P 500 by approximately 30 basis points over 10 years ended May 2014."

In other words, according to the Seattle Metropolitan who covered the story, "Take the CU200 [top 200 fossil fuel companies] out of Seattle's S&P 500 investment portfolio and employees do better, the report says ."[7]

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.[8]

[6]Shilton, A.C. "These 3 Colleges Stopped Investing in Fossil Fuels—One Year Later, Their Endowments Are Doing Just Fine." YES Magazine. December 11, 2014. http://www.yesmagazine.org/climate-in-our-hands/these-three-colleges-stopped-investing-fossil-fuels-endowments

[7]Licata, Nick. "City Report: Fossil Free Fund"Outperforms" Standard S&P 500." Seattle Pension Report Supports Divestment. November 24, 2014. http://www.seattlemet.com/news-and-profiles/publicola/articles/city-report-fossil-free-fund-outperforms-standard-s-and-p-500-november-2014

[8]United Nations Environment Programme Finance Initiative and Mercer [241]

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.[9] In other words, the portfolio does become riskier , but by such a trivial amount that the impact is statistically insignificant.[10]

Forward Looking

Carbon Tracker and Standard & Poor's conducted a join t study on the implications of carbon constraints for credit ratings of the oil and gas sector. Their scenario assumes reducing demand for carbon -intensive fuels, in line with the internationally recognized limit of a 2 $^{\circ}$ 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.[11]

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.[12] ,[13]

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

[9] 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."

[10] Geddes [70]

[11] Redmond and Wilkins [180]

[12] Deutsche Bank Group [48]

[13] Mercer [145]

strategy that avoids fossil fuels — and many other unsustainable industries — need not come at the cost of financial performance or increased portfolio risk.[14]

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 return in 2013.[15]

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.[16][17]

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).[18]

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.

[14] Humphreys [104]
[15] Nelson [161]
[16] Impax Asset Management [106], 5.
[17] Thorpe [228]
[18] MSCI ESG Research [148], 5.

Divestment is the only effective shareholder action

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 Canada, 80 percent of Canada's GHG emissions arise from the "production or consumption of fossil fuels for energy purposes".[19] Fuels exported from Canada for use elsewhere also exacerbate global warming.[20] Particularly by funding the construction of long-lasting fossil fuel infrastructure, McGill University'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 McGill University 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 Canada lists its business activities as follows: "Shell Canada's Upstream businesses explore for and extract natural gas, and market and trade natural gas and power. Our Downstream business refines, supplies, trades and ships crude oil worldwide and manufactures and markets a range of products, including fuels, lubricants, bitumen and liquified petroleum gas (LPG) for home, transport and industrial use".[21] ExxonMobil describes its upstream and downstream activities similarly.[22] 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.[23]

Shareholder activism is not a credible strategy for influencing companies worth $4.4 trillion to agree to renounce 40-60% of their value by keeping their reserves underground .[24] Yet government regulation could achieve this goal.

Given the centrality of oil and natural gas extraction, as well as the refinement and sale of these resources, to the 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

[19] Government of Canada [80]

[20] The coal exported annually from the Westshore terminal near Vancouver ships 21 million metric tons of coal annually, which in turn produces GHG emissions equivalent to 5% of Canada's total (Sightline Institute [198]).

[21] Shell Canada [194]

[22] ExxonMobil [58]

[23] Here's the testimony of one group that tried for 20 years to decarbonize BP and Shell: http://www.theguardian.com/environment/2015/jan/15/it-is-impossible-todays-big-oil-companies-adapt-climate-change-jonathon-porritt

[24] The market capitalization of $4.4 trillion CAD comes from this Carbon Tracker report: http://www.carbontracker.org/report/wasted-capital-and-stranded-assets/

dissolving their existing business models. Therefore, it would be unreasonable for McGill University 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 McGill University to adopt in order to eliminate any financial complicity in the fossil fuels industry's socially injurious activities.

McGill donors expect a commitment to sustainability

Donors give to McGill University to help enact its values particularly around education and public policy. Certainly, donors expect their money to be managed responsibly. But if McGill invests in companies that act against its values, donor money has been abused. When McGill's investments act against its values, McGill ends up colluding with and giving its stamp of approval to the very problems it seeks to solve as an institution. Many alumni have contacted Divest McGill, shocked and deeply concerned that the university invests in our destruction, asking what they can do to help.

President Stephen Mulkey of Unity College in Maine, which was the first school in the United States to divest its holdings in fossil fuels, writes, "After we divested we started receiving donations online... . We've seen an uptick in our inquiries from students. I think that will transform into an improvement in enrollment."[25] This once again supports the notion that McGill's finances are secured, not threatened, by divestment. The inverse is true: there is reason to believe that continuing to invest in fossil fuels would diminish the excitement and loyalty of alumni and reduce donations.

Finally, donors to McGill University are responsible for being familiar with the values of the university. McGill has publicly committed to being a leader and making serious commitments to protecting human rights and the environment: Vision2020 Sustainability Strategy (2014), the Sustainability Policy (2010), the Environment Policy (2001), the Halifax Declaration (1991), and the Talloires Declaration (1990). For a further analysis of McGill's commitments to sustainable values—values the fossil fuel industry contradicts—see Appendix 2: Divestment with the fossil fuel industry is in line with McGill's policy, values, and vision . When donors give to McGill they expect McGill to maximize returns within the ethical norms of the university in order to fulfill—not contradict—the mission of McGill University.

Divestment aligns with McGill's values

At Divest McGill we see no reason why McGill's investments do not follow similar criteria to its purchasing of goods and services for other parts of university life: if the purpose of purchasing a new car for McGill security is to drive, and McGill has the option of buying one that pollutes quite a bit above average and well-below average, McGill is already purchasing the less polluting vehicle even for a slightly higher price. Yet when choosing stocks, McGill cannot find any difference between stocks who protect our future and

[25] Beauchesne, Calvin. "Fossil Fuel Divestment Makes Financial Sense." Arthur: The Peterborough and Trent University Independent Press. September 23, 2013. http://trentarthur.ca/fossil-fuel-divestment-makes-financial-sense/

stocks whose entire business model is destroying forest, upheaving native people, and filling our atmosphere with pollutants. The principle is the same: these stocks are financial services to the university. Wherever more sustainable investments can be found, these should be favoured; wherever it can be shown that stocks are destructive, they should be disfavoured.

By investing in these industries, McGill's silence supports destruction of the environment and the biosphere where these investments could easily be changed, and this change would have a significant impact.

Short Answers to Commonly Cited Questions

Is it appropriate for McGill to "take sides" on social and political issues?

For centuries, universities and other institutions of learning have challenged the status quo. Conclusions made from empirical research, like the theory of gravity and evolution, can challenge conventional wisdom or dogmatic principles that are often supported by established political power-structures and concentrated economic interests. Universities have also taken an active role in addressing important contemporary social and political issues by considering the ethical responsibility of investment practices and using divestment from objectionable companies, states, or business sectors as an effective method not only to meet their own ethical responsibilities but to take a leadership position in a broader issue. Divestment from fossil fuels follows precedents established by McGill University and other universities around the world: divestment from South Africa in response to the abuses of apartheid and divestment from tobacco companies in response to unethical businesses practices associated with an industry with significant impacts to human health. In the same manner, fossil fuel divestment campaigns have spread to universities, foundations, and other institutions as a legitimate mechanism to address economic investments in morally questionable companies and to erode the influence of these corporations on social, economic and environmental policy.

McGill University's Committee to Advise on Matters of Social Responsibility (CAMSR) establishes appropriate criteria that the Board of Governors will consider when taking administrative action on issues of social, political and environmental issues. CAMSR defines social injury as:

" the grave injurious impact which the activities of a company is found to have on consumers, employees, or other persons, or on the natural environment. Such activities include those which violate, or frustrate the enforcement of rules of domestic or international law intended to protect individuals against deprivation of health, safety, or basic freedoms, or to protect the natural environment."

The mandate of the committee is thus to

"advise the Board on matters concerning social responsibility related to University investments within the mandate of the Investment Committee of the Board."

For the reasons extensively elaborated in this brief, divestment from fossil fuel companies is compatible with this recently amended policy. 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.

Permitting climate change to continue unabated challenges the core values of the university, including an expressed commitment to sustainability described in McGill's Vision 2020. 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, both today and for generations to come

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 to take action in response to every social wrong, but they should work to "avoid and correct self-caused social injury". 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 behaviour.

Isn't shareholder engagement a better option?

As with the tobacco industry, the problem with the fossil fuel industry is the product itself. It is not plausible that McGill could attend a shareholder meeting of Peabody Energy and convince them to stop extracting and burning coal. Likewise, shareholder activism cannot persuade Shell to stop producing oil and gas.[1] Not only would this run counter to the nature of the companies themselves, but it would also be impossible given the fairly insignificant size of McGill's investments. The approximately 9.1 thousand shares that McGill was reported as having at the end of 2014 is a miniscule fraction of the 3.9 billion outstanding shares in the company.

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 dominate 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.

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 research by leading academics have considered the questions involved seriously and decided that it is appropriate to act.

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

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".[2]

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.[3]

What are the McGill University's peer schools doing?

Fossil fuel divestment campaigns are active at more than 300 schools across North America, and on campuses in Europe, Australia, and New Zealand, including:

- Harvard University, Yale University , Princeton University, Stanford University, MIT, Duke University, Caltech, the University of Michigan, Tufts University, Swarthmore College and Wellesley College in the United States;
- The University of British Columbia, the University of New Brunswick-Fredericton, the University of Victoria, the University of Toronto, McMaster University, Dalhousie University, Concordia University, and Simon Fraser University in Canada;
- The London School of Economics and Political Science, King's College London, the University of Saint Andrews, Cambridge University, and Oxford University in the United Kingdom.

To date, over 25 universities and colleges have pledged to pursue fossil fuel divestment , including San Francisco State University Foundation, The New School in New York City, Hampshire College, Unity College, Sterling College, College of the Atlantic, and Green Mountain College.[4]

Divestment campaigns at many prominent American schools have been very active:

- Divest Harvard has met with the university administration and with trustees to discuss divestment.[5][6] On April 11th 2013, 1,300 petition signatures were delivered to the Harvard administration in support of divestment.[7] 7 1 percent of students voted in favour of fossil fuel divestment in a referendum.[8]

[2] Sheppard and West [196]

[3] See also: "Companies like ExxonMobil, Shell, BP have billions of dollars/euros. How can divesting the funds from a few institutions like universities, pensions and churches make an impact?" at: http://gofossilfree.org/faq/

[4] http://gofossilfree.org/commitments/

[5] Divest Harvard [49]

[6] Borowsky, Maxmin, and Franta [16]

[7] Divest Harvard [49]

[8] Twomey [232]

- On May 30th 2013, the faculty senate at the University of California, Santa Barbara voted in favour of fossil fuel divestment. In total, the student governments at seven campuses of the University of California have voted in favour of divestment.[9]
- The president of Tufts University has established a working committee to consider fossil fuel divestment, as well as other steps the school could take to address climate change.[10]
- Hampshire College , which was the first university to divest from South Africa during the 1980s, was also the first school to officially commit to fossil fuel divestment.[11]

Divestment campaigns have also been launched by students at schools across Canada:

- At the University of New Brunswick , students have collected over 300 signatures in support of divestment.[12] They have also submitted a presentation and resolution of support to the student union.[13]
- At the University of British Columbia , students are calling on the UBC Investment Management Trust to sell the school's $7.14 million in oil and gas investments.[14] In June 2013, UBC adopted a new responsible investment strategy.
- Other schools with divestment campaigns in Canada include University of Toronto, Dalhousie University, and others.

Although Stanford and Concordia have partially divested, no major university has yet committed to fully divest from fossil fuels. Yet this campaign shows every sign of being wildly successful across North America. This gives McGill 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, McGill can contain this financial risk and boost its international reputation, which will help promote the university and attract and recruit top prospective students.

Questions about divestment raised at other schools

On June 4th 2013, the Board of Governors of the University of British Columbia (UBC) approved a new responsible investment strategy that included a number of objections to using divestment in response to concern about companies causing social injury.[15]

[9] University of California Santa Barbara Environmental Affairs Board [253]
[10] Henn [100]
[11] Twomey [232]
[12] Fossil Free UNB [65]
[13] Fossil Free UNB [65]
[14] Katic [122]
[15] University of British Columbia, Vice President Finance, Resources, & Operations [252]

The first concern the board raised is about the challenge of effectively screening potential investments according to environmental, social, and governance concerns:

Issues with portfolio screening are multiple and complex. Ethically, portfolio screening is difficult to apply to reflect the competing political, environmental and social interests playing out at any given time, and whether these interests should be company specific or sector-wide.

The second issue raised was that of investments in foreign companies:

Economically, screening out entire sectors such as the Canadian energy sector would push more of the endowment outside of the country, into geographic areas that often have more questionable social and environmental records.

The last objection to divestment regards investment in funds:

Financially, implementing a direct screening policy would prevent UBC from investing in pooled or indexed funds and would generate significant overhead that would negatively impact student and researchers supported by the endowment.

These issues are addressed in the approach proposed by Divest McGill. We propose divestment from the 200 companies with the largest fossil fuel reserves (included in: Appendix 1). The companies' inclusion on the list directly pertains both to the degree of social injury that burning their reserves would cause, as well as the degree of regulatory risk involved in investing in these firms, given the growing willingness of governments to regulate GHG pollution. These 200 companies are global, mitigating the risk that McGill would shift its endowment into more damaging companies abroad. In addition, the proposal calls only for divestment of direct stock holdings at this time, eliminating the issues of divestment from funds.

What are other large investors doing?

Several cities are considering divesting themselves from fossil fuel stocks.[16] The mayor of Seattle has called for the city to divest its fund for daily operations (US$1.4 billion), its deferred compensation plan (US$700 million), and its pension system (US$1.9 billion).[17] The mayor of Portland, Oregon has urged the Oregon State Treasurer, the Local Government Investment Pool, and the Oregon Investment Council to divest all state holdings in fossil fuel companies. The San Francisco Board of Supervisors has urged the retirement board to divest US$583 million of fossil fuel holdings in the city's $16 billion retirement fund.[18] In June 2013, the city council of Providence, Rhode Island voted 11-1 in favour of divestment.[19]

Eleven regional conferences of the United Church of Christ in the United States have voted to divest.[20] Numerous other churches and faith-based organizations are considering divestment, including the First

[16] See: Fossil Free, "Divestment Committments." http://gofossilfree.org/commitments/
[17] McGinn [139]
[18] Saxifrage [186]
[19] Henn [100]
[20] Wangsness [260]

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".[21] In July 2013, the Norwegian financial services company Storebrand ASA announced that they will be divesting from 19 fossil fuel companies.[22] The decision was motivated by the belief that the value of these companies would fall because of their negative climate change impacts.[23][24] The Dutch bank Rabobank has also decided not to fund shale oil development.[25] 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".[26]

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.[27][28] Each year, these three institutions provide US$168 billion in funding for projects around the world.[29]

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'.[30] 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.[31] BP has since abandoned its foray into solar power generation and put its U.S. wind-farm business up for sale.[32][33] 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 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".[34] In April 2010, BP's Deepwater Horizon oil

[21] Steyer [208]
[22] Storebrand ASA [209]
[23] Blackburne [15]
[24] Grandia [89]
[25] Bertini [13]
[26] DutchNews.nl [51]
[27] The CEE Bankwatch Network, SEE Change Net, and the WWF [214], 9-10.
[28] EurActiv.com [56]
[29] The CEE Bankwatch Network, SEE Change Net, and the WWF [214], 10.
[30] Pearce [171]
[31] The Oxford English Dictionary defines the term as: "The creation or propagation of an unfounded or misleading environmentalist image"
[32] Winkley [267]
[33] David [44]
[34] The Economist [217]

platform in the Gulf of Mexico exploded, causing over $40 billion in damage, alongside massive ecological harm.[35] All told, BP may end up paying over US$90 billion in fines and compensation for causing the disaster.[36] 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.[37]

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.[38] In 2003, BP invested $6.75 billion in Russia's Tyumen Oil Company, which is involved with the massive Sakhalin offshore project.[39] In total, the Government of Alberta expects over $218 billion to be invested in the oil sands over the next 25 years.[40] 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.[41][42]

Conventional fossil fuel sources are more than sufficiently abundant to allow humanity to far exceed the 2 $^\circ$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 (for instance 43$ a metric tonne in 2015), the total damage being done to society by fossil fuel burning substantially exceeds the scale of the investments the industry is making in renewables.[43]

Isn't the energy sector highly regulated by government at all levels?

When it comes to GHG pollution, the fossil fuel industry is essentially unregulated at the federal level in Canada. Firms are free to use the atmosphere as a dumping ground for pollution.[44][45] 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, many governments in Canada have adopted policies intended to accelerate the growth of the fossil fuel sector's growth. These include aggressive international lobbying for oil pipelines and other forms of

[35] Shawn McCarthy {2013}.
[36] The Economist [221], 20.
[37] Juhasz [121]
[38] The Wall Street Journal [225]
[39] The Economist [218]
[40] Government of Alberta [76]
[41] Carbon Tracker Initiative [28], 4.
[42] Steiner [205]
[43] See: Social cost of carbon: McGill "owns" 7M in harm in Canada alone
[44] Paris [168]
[45] Stewart [207]

fossil fuel export infrastructure.[46][47][48] They also include steps to weaken environmental assessment processes, reduce the scope of scientific research being conducted on climate change while suppressing the publication of results from government scientists, and maintain substantial subsidies to the fossil fuel industry. Canada's 2020 emissions are expected to substantially exceed the target it adopted under the Copenhagen Accord.[49] In their assessment of Canada's compliance with G8 efforts to control climate change, the G8 Research Group at University of Toronto's Munk School concluded that: "Canada has not complied with its commitment to take robust legislative and funding action to reduce its greenhouse gas emissions by 2020".[50] They also argue that Canada has not "passed legislation that demonstrates a sincere effort to limit its domestic emissions".[51]

The regulation that exists in Canada 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.

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.[52] 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".[53] 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.[54]

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

[46]

7. For example.

[47] McCarthy [138]
[48] Oliver [165]
[49] Partington [170]
[50] Clarke et al. [35], 129.
[51] Clarke et al. [35], 156.
[52] MacKay [133]
[53] MacKay [133], 178.
[54] MacKay [133], 106. See also 238.

could come from wind, reducing annual electric sector emissions by 825 million metric tons.[55] Iowa already generates 39 percent of its energy from this low-carbon source.[56] 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.[57]

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".[58] 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.[59] By 2035, the IEA predicts that improved energy efficiency could cut energy expenditures by 20 percent, alongside "wider economic gains, particularly for India, China, the United States and Europe".[60]

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 () and other harmful emissions from power plants—the biggest source of global warming pollution in the United States".[61] The report finds that this policy would create three times as many jobs as producing the same amount of energy from fossil fuels.[62] 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".[63][64] 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

[55] United States Department of Energy [245]
[56] The Economist [221]
[57] The Economist [221]
[58] International Energy Agency [116], 13.
[59] International Energy Agency [116], 14.
[60] International Energy Agency [116], 15.
[61] Union of Concerned Scientists [235]
[62] See: Union of Concerned Scientists [236].
[63] The World Bank [226], 13.
[64] Schuetze [187]

challenge the existence of our society as we know it today."[65]

Whether we like it or not, humanity must learn how to manage without fossil fuels.

Won't divestment hurt the endowment, including McGill's scholarships?

As discussed at greater length in , 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 incorporation of ESG factors into portfolio management.[66][67] 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.[68][69]

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.

Won't fossil fuel companies stop making donations to McGill?

Donations from fossil fuel companies are important for research in departments such as mining engineering. However, 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.

[65] Government of Australia Climate Commission [78], 5.
[66] Deutsche Bank Group [48]
[67] Mercer [145]
[68] Steyer [208]
[69] Steyer [208]

Two major motivations for corporate donations to the university 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 could continue in spite of divestment.

When Unity College divested, they experienced an uptick in applications and donations.[70]

Shouldn't McGill fight climate change through research and education?

McGill University is active in climate change research and teaching, and has made clear that its involvement will continue.[71] This research has helped to establish what a serious and pressing problem climate change is for people in Canada and around the world. Although this work is very welcome, it is not a substitute for divestment. The very existence of the divestment policy shows that the university has accepted the basic argument that some investments are incompatible with the values of the university.

Won't divestment hurt Canadian jobs and the economy?

This question gets the argument backwards: not dealing with climate change could cause enormous harm to Canadian prosperity. 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 , climate change poses a serious risk to Canadian prosperity. Furthermore, there are major risks associated with continuing to invest in fossil fuel projects.

Right now, the Canadian economy is excessively dependent on fossil fuel production and export. Canada also has excessively high per-capita emissions of GHG pollution — meaning we will probably need to cut faster and deeper than most, as part of a fair global transition to a low-carbon economy. Given that the future will be carbon-constrained, it is urgent that we start reducing that dependence. Divestment by McGill would send an important signal to help initiate this necessary transition. As highlighted in the Stern Review: "The benefits of strong, early action on climate change outweigh the costs".[72] 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 Canadian 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.[73] These will include the retrofitting of buildings to improve efficiency, the construction of renewable energy infrastructure, and research and development to support and enhance

[70] McKibben [141], 4.
[71] See: McGill Office of Sustainability. "Vision 2020: A Sustainability Strategy for McGill." McGill Office of Sustainability.
[72] Stern [206], i.
[73] Stern [206], xvii.

the transition. As a key research institution, McGill can participate directly in that part of the world's economic realignment.

Can't we just adapt to climate change?

As described at considerable length in the section on the impacts of climate change ( ) , 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.[74]

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 adaptation 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.

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

Carbon capture and sequestration (also called carbon capture and storage) is a technology that promises to separate from the emissions of facilities like power plants and bury it in underground formations such as saline aquifers.[75] The technology has already been deployed in certain applications, such as the re-injection of unwanted in the Sleipner gas field 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 into the atmosphere annually.[76] As an article in the MIT Technology Review explains: "[I]f we were to bury just one-fifth of the global 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".[77] 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".[78]

On the economics of CCS, The Economist explains:

[74] Act!ionAid, CARE, Germanwatch, and the WWF [2]
[75] See also: Promoting False Hope: Carbon Capture and Sequestration
[76] International Energy Agency [115]
[77] Bullis [22]
[78] The Economist [220]

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.[79]

Despite considerable government subsidies, including $3.4 billion in an American stimulus bill, CCS remains unattractive to energy utilities largely because of cost.[80] In a discussion paper published by the Belfer Center for Science and International Affairs at Harvard, it was estimated that sequestering one tonne of would cost approximately $150 — far more than the cost of avoiding the emissions in the first place by implementing lower-cost measures.[81]

Other considerations include the stability of formations into which is injected and the seismic consequences of doing so.[82][83] Carbon dioxide is heavier than air, so leaks from CCS facilities could smother people and animals nearby.[84] Water saturated with carbon dioxide 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 cannot plausibly be separated from waste gases and stored. Given that 85 percent of the total 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.[85][86]

The failure of CCS to live up to its promise is especially problematic for Canada, given the degree to which the climate change plans of the federal government and the Government of Alberta depend on this technology becoming cheap and effective in the near term. Canada's unrealistic expectations for CCS mean that decarbonization will be even more challenging than the federal and provincial governments expected, making it all the more important to begin investing in decarbonization now.

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 concentrations and

[79] The Economist [220]
[80] The Economist [220]
[81] Al-Juaied and Whitmore [4]
[82] Zoback and Gorelick [275]
[83] Sheridan [197]
[84] The Economist [220]
[85] Canadian Broadcasting Corporation [26]
[86] McCarthy [137]

those that would actually seek to draw 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 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.[87]

But I need to drive my car to work, so isn't divestment hypocritical?

Our divestment demand is the same as the demand from the climate science: that fossil fuel companies keep 80% (note we did not say 100%) of their reserves underground. This 20% must be used to power a transition. Exploring for more fossil fuels and conspiring to extract anything more than 20% of current reserves is immoral and extremely harmful.

As we have argued extensively in this submission, divestment as a tactic will create policies that promote sustainability on the individual level.

But fossil fuel companies don't own the majority of reserves?

This is not the fossil fuel industry of the 70s, 80s, or 90s. Two factors have fundamentally changed the fossil fuel industry. First, they are running out of cheap carbon to extract. The fossil fuel industry is taking bigger risks, using more destructive methods, and being more aggressive about Indigenous land grabbing and pollution. The pattern is the same from mountaintop removal, to the oil sands, to fracking, to shale oil, to drilling in the arctic, to the diluted bitumen spill in the Kalamazoo River, to the offshore drilling that caused the Deepwater Horizon spill in the Gulf of Mexico: bigger risks, more lives ruined. The threats to the environment and humanity loom bigger and bigger, and the destructive impacts wrought by a few corporations keep growing.

[87] Gardiner [69]

Second, the solid scientific evidence of climate change has given the fossil fuel industry a choice: respect the science at a loss of $1.8-2.7 trillion or fight tooth and nail against political, scientific, media, and popular awareness and action on climate change.[88] Despite the huge risk and the huge costs already imposed on millions of people, the fossil fuel industry continues to choose the latter, flooding our political systems with cash, funding questionable science, deceptive public relations tactics, and, most importantly, exploring for more fossil fuels when the science and 180+ world governments say we need to keep 80% of current reserves underground.

Finally, the basic economics of the fossil fuel industry make it a crucial driver of climate change. An estimated 50% of fossil fuel company share price is based on their ability to maintain a balance of carbon in reserve for all the carbon that is extracted. In other words, they are fossil fuel explorers.[89] The process of exploiting their existing reserves is relatively automated and routine. It is the process of exploring for more carbon that occupies much of the effort, thought, and a surprising amount of the money of these companies—$744 billion CAD per year. Yet the carbon exploration fundamental to their business model is unethical in an area of unprecedented climate change, and goes against any reasonable hope for a liveable future.

[88]The market capitalization of $4.4 trillion CAD comes from this Carbon Tracker report:

[89]"Smart investors can see that investing in companies that rely solely or heavily on constantly replenishing reserves of fossil fuels is becoming a very risky decision. The report raises serious questions as to the ability of the financial system to act on industry-wide long term risk, since currently the only measure of risk is performance against industry benchmarks." Professor Lord Stern. http://business.financialpost.com/2013/06/21/oil-climate-change-producers/?__lsa=f9a4-59ea

Appendices

Appendix 1: Top 200 Fossil Fuel Companies of 2014

Rank:	Oil & Gas Companies:	Oil & Gas Reserves (GtCO2):	Coal Companies:	Coal Reserves (GtCO2):
1.)	Gazprom	43.54	Coal India	57.722
2.)	Rosneft	12.039	Shenhua	31.523
3.)	PetroChina	8.577	Adani Enterprises	25.383
4.)	ExxonMobil	8.181	Shanxi Coking Coal	18.445
5.)	Lukoil	6.946	BHP Billiton	13.469
6.)	BP	6.4	Anglo American	12.985
7.)	Petrobras	5.35	Inner Mongolia Yitai Coal	12.223
8.)	Royal Dutch Shell	4.473	Datang International PG	12.206
9.)	Chevron	4.137	China National Coal	12.071
10.)	Total	3.813	Peabody Energy	11.469
11.)	Novatek	3.777	Glencore Xstrata	10.453
12.)	ConocoPhillips	2.73	Datong Coal Mine	10.281
13.)	Tatneft	2.689	Yanzhou Coal Mining	9.799
14.)	ENI	2.561	Public Power	9.339

15.)	ONGC	2.152	Exxaro Resources	8.793
16.)	Statoil	1.939	Yangquan Coal Industry	7.298
17.)	Sinopec	1.571	Mechel	6.739
18.)	CNOOC	1.521	Arch Coal	6.53
19.)	BG	1.257	Alpha Natural Resources	5.482
20.)	Occidental	1.253	Mitsubishi	4.738
21.)	Apache	1.047	Vale	4.401
22.)	Canadian Natural Resources	0.98	Rio Tinto	4.338
23.)	Anadarko Petroleum	0.904	Evraz	4.235
24.)	BHP Billiton	0.897	Raspadskaya	4.084
25.)	Devon Energy	0.894	Consol Energy	3.214
26.)	Chesapeake Energy	0.889	Bumi	3.181
27.)	Bashneft	0.876	United Co Rusal	3.081
28.)	Inpex	0.762	Neyveli Lignite	3.035
29.)	Ecopetrol	0.737	Pingdingshan Tianan Coal	3.023
30.)	EOG Resources	0.65	Cloud Peak Energy	2.881
31.)	Suncor Energy	0.636	Sasol Mining	2.731
32.)	Marathon Oil	0.624	Severstal	2.726
33.)	Hess	0.61	AGL Energy	2.704
34.)	Imperial Oil	0.587	Tata Steel	2.679
35.)	Encana	0.568	Teck Resources	2.603
36.)	BASF	0.453	Eurasian Natural Resources	2.586
37.)	Repsol	0.446	Kuzbass Fuel	2.504
38.)	OMV	0.413	Polynus Gold	2.294

39.)	Noble Energy	0.412	Energy Ventures	2.184
40.)	Woodside Petroleum	0.392	Whitehaven Coal	2.055
41.)	Pioneer Natural Resources	0.39	Banpu Minerals	2.04
42.)	Cenovus Energy	0.362	RWE	1.943
43.)	YPF	0.356	Washington H Soul Pattison	1.85
44.)	Range Resources	0.352	Resource Generation	1.818
45.)	PTT	0.339	PT Bayan Resources	1.806
46.)	Husky Energy	0.334	Churchill Mining	1.745
47.)	EQT	0.327	NTPC	1.74
48.)	Continental Resources	0.311	PT Adaro Indonesia	1.607
49.)	Talisman Energy	0.31	Nacco Industries	1.557
50.)	KazMunaiGas EP JSC	0.298	Idemitsu Kosan	1.53
51.)	Linn Energy	0.272	Alliance Resource Partners	1.475
52.)	WPX Energy	0.258	Huolinhe Coal	1.387
53.)	QEP Resources	0.22	Coalspur Mine	1.38
54.)	Southwestern Energy	0.219	Mitsui & Co	1.366
55.)	Consol Energy	0.218	PT Golden Energy Mines	1.354
56.)	Cabot Oil&Gas	0.212	Coal of Africa	1.339
57.)	SandRidge Energy	0.211	Novolipetsk Iron &Steel	1.288
58.)	Newfield Exploration	0.207	Wesfarmers	1.094
59.)	Murphy Oil	0.206	Tata Power	1.062
60.)	Dragon Oil	0.203	Magnitrogorsk Iron & Steel	1.046

61.)	Freeport-McMoRan C&G	0.183	Sherritt International	1.012
62.)	Concho Resources	0.173	Kazakhmys	0.998
63.)	Ultra Petroleum	0.169	New World Resources	0.972
64.)	Denbury Resources	0.166	Koks	0.959
65.)	GDF SUEZ	0.162	Mongolian Mining	0.903
66.)	MEG Energy	0.155	Itochu	0.878
67.)	Whiting Petroleum	0.151	Westmoreland	0.864
68.)	RWE	0.148	Cockatoo Coal	0.851
69.)	MOL	0.146	Meijin Energy	0.784
70.)	Crescent Point Energy	0.145	Jizhong Energy Resources	0.742
71.)	Mitsui	0.142	Bandanna Energy	0.731
72.)	Penn West Petroleum	0.14	Polo Resources	0.726
73.)	Pacific Rubiales Energy	0.132	Allete	0.723
74.)	Oil India	0.132	CLP Holdings of Hong Kong	0.696
75.)	Cimarex Energy	0.13	Aspire Mining	0.67
76.)	Energen	0.126	Walter Energy	0.641
77.)	Oil Search	0.117	Aquila Resources	0.627
78.)	Berry Petroleum	0.11	Coal Energy	0.614
79.)	ARC Resources	0.109	China Resources Power	0.567
80.)	Canadian Oil Sands	0.109	Patriot Coal	0.518
81.)	Genel Energy	0.105	PT Indika Inti	0.485
82.)	SM Energy	0.102	ArcelorMittal	0.464
83.)	Sasol	0.089	First Energy	0.458

84.)	National Fuel Gas	0.088	Black Hills Power	0.431
85.)	Tullow Oil	0.088	Wescoal Holdings	0.43
86.)	Pengrowth Energy	0.088	Grupo Mixico SA de CV	0.42
87.)	Xcite Energy	0.085	African Rainbow minerals	0.379
88.)	Vermillion Energy	0.082	Shanxi Coal I&E	0.376
89.)	Peyto E&D	0.079	Capital Power	0.367
90.)	Quicksilver Resources	0.077	PTT Public	0.359
91.)	Petroceltic International	0.077	Lanhua	0.338
92.)	Forest Oil	0.076	Fortune Minerals	0.328
93.)	Tourmaline Oil	0.074	Cardero Resources	0.323
94.)	Bonavista Energy	0.072	Zengzhou Coal Ind & EP	0.319
95.)	Premier Oil	0.071	Steel Authority of India	0.307
96.)	Enerplus	0.071	Jindal Steel & Power	0.301
97.)	Energy XXI	0.07	Shougang Fushan Resources	0.299
98.)	PDC Energy	0.068	Jingyuan Coal	0.297
99.)	Swift Energy	0.067	Stanmore Coal	0.287
100.)	Rosetta Resources	0.067	Prophecy coal	0.272

Available here: http://goo.gl/lvC738

Appendix 2: Divestment with the fossil fuel industry is in line with McGill's policy, values, and vision

From the McGill University Social Responsibility policy (CAMSR) (2014)

(3) Mandate of the Committee: Taking due regard of the mission of the University, and the fiduciary duties of the Board to manage investments prudently to maximize returns, the Committee shall advise the Board on matters concerning social responsibility related to University investments within the mandate of the Investment Committee of the Board.

. . .

(2): For the purposes of the mandate of this Committee, the term "social injury" means the grave injurious impact which the activities of a company is found to have on consumers, employees, or other persons, or on the natural environment. Such activities include those which violate, or frustrate the enforcement of rules of domestic or international law intended to protect individuals against deprivation of health, safety, or basic freedoms, or to protect the natural environment. However, a company shall not be deemed to cause "social injury" simply because it does business with other companies which are themselves engaged in socially injurious activities.

. . .

Where the Committee has made a finding that social injury has occurred, in its consideration of possible actions, it shall take into account the gravity of the social injury, the potential effectiveness of various means of influencing corporate behaviour, the University's need to adhere to sound financial policy, and consistency between the possible actions and the mission of the University.

It is worth noting also that the McGill Board's precedent (cf. CAMSR Tobacco, 2007) has been that a corporation's activity is considered significant if more than ten percent of the entity's revenues are derived from the undesirable activity .[1]

From the McGill University Environment Policy (2001)

"McGill University shall strive to be recognized as an environmentally safe and responsible institution of learning, and as a model of environmentally responsible living.

To this end, the McGill University community shall make every reasonable effort to:

1. Prevent the over-consumption of energy and other resources and reduce the production of waste and the release of substances harmful to the biosphere;

[1] https://mcgillileaked.wordpress.com/2015/01/05/the-mcgill-university-board-of-governors-2007-motion-decision-to-divest-from-tobacco/)

2. Maintain purchasing policies which favour environmentally benign, post-consumer, bio-degradable, and non-toxic products wherever possible;

3. Encourage all members of the McGill community to be environmentally aware

. . .

5. Seek additional ways of achieving our goal of being environmentally safe and responsible.

. . .

We at McGill University are committed to fulfilling our academic mission and managing all resources in harmony with our natural environment. We are committed to meeting our social, scientific, ethical and educational leadership responsibility in actively promoting the restoration and preservation of a healthy environment for the future, and in contributing to building an equitable world.

Our commitment to raising environmental awareness and acting on it is manifested in our teaching and research activities, in other services which we provide to the McGill community and society at large, and in the individual and collective decisions which we take to offset the negative impact of the University's operation and activities on the Environment.

We are committed to increasing the University community's awareness of environmental issues, by fostering the appropriate values, knowledge, and skills to enable us to work towards the restoration and preservation of the Environment."

At Divest McGill we see no reason why McGill's investments do not follow similar criteria to its purchasing of goods and services for other parts of university life: if the purpose of purchasing a new car for McGill security is to drive, and McGill has the option of buying one that pollutes quite a bit above average and well-below average for the same price, McGill is already purchasing the less polluting vehicle. Yet when choosing stocks, McGill cannot find any difference between stocks who protect our future and stocks whose entire business model is destroying forest, upheaving native people, and filling our atmosphere with pollutants. The principle is the same: these stocks are financial services to the university. Wherever more sustainable investments can be found, these should be favoured; wherever it can be shown that stocks are destructive, they should be disfavoured.

By investing in these industries, McGill's silence supports destruction of the environment and the biosphere where these investments could easily be changed, and this change would have a significant impact.

McGill signed the 1990 Talloires Declaration committing McGill to "set an example of environmental responsibility," promising to "commit itself seriously and act sincerely to minimize negative environmental impact."[2] The Talloires Declaration explicitly mentions greenhouse gases as a threat to "the survival of humans and thousands of other living species, the integrity of the earth and its biodiversity, the security of nations, the heritage of future generations." In the subsequent twenty years science has done nothing but confirm, reinforce, and darken the picture of these threats.

[2]Full text at: https://www.mcgill.ca/files/secretariat/environmental-policy.pdf)

The Talloires Declaration continues: " We believe that urgent actions are needed to address these fundamental problems and reverse the trends. Stabilization of human population, adoption of environmentally sound industrial and agricultural technologies, reforestation, and ecological restoration are crucial elements in creating an equitable and sustainable future for all humankind in harmony with nature.

Universities have a major role in the education, research, policy formation, and information exchange necessary to make these goals possible. Thus, university leaders must initiate and support mobilization of internal and external resources so that their institutions respond to this urgent challenge.

We, therefore, agree to take the following actions:

1. Increase Awareness of Environmentally Sustainable Development

Use every opportunity to raise public, government, industry, foundation, and university awareness by openly addressing the urgent need to move toward an environmentally sustainable future.

. . .

5. Practice Institutional Ecology

Set an example of environmental responsibility by establishing institutional ecology policies and practices of resource conservation, recycling, waste reduction, and environmentally sound operations.

6. Involve All Stakeholders

Encourage involvement of government, foundations, and industry in supporting interdisciplinary research, education, policy formation, and information exchange in environmentally sustainable development. Expand work with community and nongovernmental organizations to assist in finding solutions to environmental problems . "

Many stakeholders in the fossil fuel industry are refusing to cooperate with the actions required to stop climate change. They continue to use their immense influence over government and policy to slow and stop action to prevent this serious danger. They continue to falsify information about climate change and distribute this in the media, as well as attempting to hide the impact their operations have on local populations. They constantly seek to manage their image and reduce justified PR damage. Most importantly, they continue to explore for carbon when the science is clear: no more than one third of current reserves can be burned without surpassing the 2° limit—and burning less would be much safer.[3] They have made no promises to this effect nor have shown any intention of burning anything less than 100% of their reserves, despite the pledge of over 180 countries to cap mean global warming at 2°.

McGill University also signed the 1991 "Halifax Declaration." We quote extensively from this declaration as well because we believe it makes clear that any serious reading of these accords shows divestment to be a responsible and thoughtful fulfillment of McGill's mission.

[3]International Energy Agency 2012 report: "No more than one-third of proven reserves of fossil fuels can be consumed prior to 2050 if the world is to achieve the 2 °C goal." http://thinkprogress.org/climate/2012/11/13/1179251/iea-report-fossil-fuel-boom-is-a-climate-disaster-in-the-making/

" Human demands upon the planet are now of a volume and kind that, unless changed substantially, threaten the future well-being of all living species. Universities are entrusted with a major responsibility to help societies shape their present and future development policies and actions into the sustainable and equitable forms necessary for an environmentally secure and civilized world.

. . .

The Halifax meeting added its voice to those many others worldwide that are deeply concerned about the continuing widespread degradation of the Earth's environment, about the pervasive influence of poverty on the process, and about the unsustainable environmental practices now so widespread. The meeting expressed the belief that solutions to these problems can only be effective to the extent that the mutual vulnerability of all societies, in the South and in the North, is recognized, and the energies and skills of people everywhere be employed in a positive, cooperative fashion. Because the educational, research and public service roles of universities enable them to be competent, effective contributors to the major attitudinal and policy changes necessary for a sustainable future, the Halifax meeting invited the dedication of all universities to the following actions:

- To ensure that the voice of the university be clear and uncompromising in its ongoing commitment to the principle and practice of sustainable development within the university, and at the local, national and global levels.
- To emphasize the ethical obligation of the present generation to overcome those current malpractices of resource utilization and those widespread circumstances of intolerable human disparity which lie at the root of environmental unsustainability.
- To enhance the capacity of the university to teach and practise sustainable development principles, to increase environmental literacy, and to enhance the understanding of environmental ethics among faculty, students, and the public at large.
- To cooperate with one another and with all segments of society in the pursuit of practical capacity-building and policy measures to achieve the effective revision and reversal of those current practices which contribute to environmental degradation, to South-North disparities and to inter-generational inequity ."[4]

From the McGill University Sustainability Policy (2010)

"The mission of McGill University will be attained responsibly by carrying out its activities in a manner that achieves a balance between the social, economic and environmental dimensions of sustainability.

. . .

Our goal is to become an institutional model of sustainability for society as we pursue our academic mission

[4]Full text at: https://www.mcgill.ca/files/secretariat/environmental-policy.pdf)

and play a positive and proactive role in communicating the rationale and need to develop and implement sustainable practices in the broader community.

To this end, McGill University will:

Undertake the activities and operations of the University in a manner that strikes an appropriate balance between the needs and aspirations of current and future generations of the McGill and broader communities;

. . .

Encourage economic efficiencies in the University's operations that are consistent with social equity and respect for the environment;

Advance individual and collective efforts and accountabilities throughout the McGill community to make sustainability a priority in the life of the University;

Identify and conserve the cultural and natural heritage of McGill University, including properties, buildings, landscapes, traditions and knowledge, taking their intrinsic rarity and fragility into account; and

Minimize the use and consumption of energy and material resources in recognition of the finite capacity of the biosphere to accommodate human activities.

Among other initiatives undertaken in support of this Policy, the University will:

Consider activities carried out by or on behalf of the University in light of their life cycle, including their economic, environmental and social footprints ."[5]

We consider McGill's investments to be part of its operations and divestment to be a major statement of values from the community. McGill's donors understand that divestment is part of being a leader in sustainability.

From the 2014 McGill University Vision 2020 policy (Sustainability Strategy)

"Sustainability is a priority for McGill."

The McGill Sustainability Strategy emerged out of a need to coordinate and scale up the sustainability initiatives already underway at the university, and to provide a framework for future endeavours.

. . .

WE WILL KNOW WE HAVE ACHIEVED THIS WHEN THE FOLLOWING GOALS ARE MET

- Sustainability is considered in decisions made at all levels at McGill.
- McGill's financial portfolio is managed according to principles of sustainability (social, economic and environmental).

[5] https://www.mcgill.ca/files/secretariat/Sustainability-Policy.pdf)

- McGill's budgetary process and resource allocation demonstrate a commitment to sustainability as a core priority for McGill ."[6]

Appendix 3: Government action shows that climate change is a serious and expensive problem

Governments are already taking action on climate change. Although this action is insufficient because CO 2 levels are still rising, this demonstrates that climate change is commonly understood as a serious and expensive problem.

Canadian federal government

Emission standards for passenger vehicles and light trucks

In November 2012, proposed regulations were released for vehicles beginning with the 2017 model year. Average emissions from vehicles in 2025 are expected to be 50 percent of those sold in 2008.

Heavy duty vehicles

In April 2012, the federal government released regulations for heavy duty vehicles beginning with the 2014 model year.

Coal-fired power plants

In September 2012, final regulations were introduced to limit emissions from the coal-fired electricity sector.

Renewable fuel requirement

As of December 2010, gasoline is required to contain an average of 5 percent renewable content, with a 2 percent requirement for diesel fuel.

Carbon capture and storage (CCS)

Canada's federal and provincial governments have committed a total of approximately $3 billion in funding for CCS, which could lead to as many as five to six large-scale demonstration projects in Canada.

Agricultural greenhouse gases

Canada is contributing $27 million toward the Global Research Alliance on Agricultural Greenhouse Gases, a group created to advance research, technology transfer, and adoption of beneficial management practices to mitigate agricultural greenhouse gases.

Environment Canada also publishes information on Canada's GHG emissions as part of its suite of environmental indicators.

[6] http://www.mcgill.ca/sustainability/sites/mcgill.ca.sustainability/files/v2020_ss_eng.pdf

Provincial government of Quebec

In an effort to fight climate change, Quebec has implemented a cap-and-trade system (also known as a "carbon market") for greenhouse gas emission allowances. The market's first compliance period began on January 1, 2013. The goal for the second period, beginning in 2015, is for the carbon market to cover 85% of Quebec's greenhouse gas emissions. Companies that succeed in reducing their emissions below the target set by the government will hold surplus emission allowances that they can then sell on the carbon market, retaining the profits. Anticipated benefits include lowering greenhouse gas emissions and stimulating Quebec's economy by creating good jobs in promising sectors. Additionally, the government aims to simultaneously encourage the efficient use of energy while promoting renewable and clean energy sources. Income from the sales of emission allowances will be placed into the green fund (Fondsvert), hopefully bringing the budget for government action in the fight against climate change to $3.3 billion by 2020. These revenues will be used exclusively to finance initiatives to further reduce greenhouse gas emissions. On January 1, 2014, Quebec linked its carbon market to California's nearly identical system, representing the first cross-border carbon market in North America, with both governments now holding joint auctions of greenhouse gas emission units.[7]

City government of Montreal

Montreal's first Strategic Plan for Sustainable Development was released in April 2005. Its objective was to reduce greenhouse gas emissions by 20% in 2012 (based on 2002 emissions): a goal three times more demanding than the Canadian objective set under the Kyoto Protocol. This Corporate Action Plan involved:

-Four actions relating to vehicles; -One action related to processes; -Five actions related to buildings; -Two actions relating to handling and sharing information.

The plan entailed an investment of $10.7 million spread out over six years, with the objective of obtaining an additional $5 million in grants. These two amounts, in addition to actions taken under the plan, were expected to generate close to $5 million per year in long-term recurring savings.

Reducing Biogas Emissions (Saint-Michel Environmental Complex)

The city of Montreal owns and operates the Saint-Michel Environmental Complex. Decomposing gas emits large quantities of methane. In 1990, 90% of greenhouse gas emissions from municipal operations were comprised of biogas. Capturing and burning this biogas to produce electricity reduced site emissions to 98% and cut emissions from the whole of Montreal by about 10%.

Creation of an Energy Fund

In 2007, Montreal's energy fund was put into place, allocating $10.7 million to be invested over six years. A number of cities in North America and Europe (Toronto, Phoenix, Edmonton, London) have created energy

[7] http://www.mddelcc.gouv.qc.ca/changements/plan_action/2006-2012_en.pdf

funds in order to provide support in achieving their energy management objectives.

Solar Wall and Solar Water Heaters

An investment of $200,000 was made in order to implement sources of renewable energy (such as solar walls and geothermal units) into municipal buildings. 50% of the allocated funding came from the FCM Green Fund under the Partners for Climate Protection program.

Renewable Energy in City Buildings

$250,000 was budgeted towards the goal of carrying out at least one renewable energy project per year for three years in city buildings.

Replace Heating Oil

$6 million from Montreal's Energy Fund budget was allocated towards the cost of replacing all heating oil in municipal buildings. However, since this form of energy comes with high operating and maintenance costs, only projects considered cost-effective under the Fund criteria were carried out.

Eliminate Certain Refrigerants

The $50 million funding came from outside the Energy Fund, as the use of these harmful refrigerant gases was prohibited under the Montreal Protocol on Substances That Deplete the Ozone Layer.

Specific Requests to the Nature Museums of Montreal

The Scientific Institutions Department invested $7 million to reduce greenhouse gas emissions by 50% (2,800 tonnes of CO2) from the Biodôme, Botanical Garden and Insectarium of Montreal. Save on Natural Gas at the Wastewater Treatment Plant Upgrading the burners at the Montreal wastewater treatment plant has made it possible to reduce its natural gas consumption. This is a $400,000 investment with a payback period of three years. Furthermore, these improvements on rainwater management play a part in reducing greenhouse gas emissions.

Discourage Vehicle Idling

Awareness sessions were held for over 4,000 municipal employees on "green" driving techniques.

Energy Efficient Police Vehicles

The majority of greenhouse emissions from the Montreal Police Department come from gasoline used by its vehicles. While respecting performance standards for police vehicles, the police department will be including fuel consumption criteria in its calls for tenders and purchasing policy, and giving preference to more economical vehicles.

Use Gasoline With 5% Ethanol

In its 2006-2012 climate change action plan, the Quebec government followed the federal government's lead by announcing that it intended to oblige fuel distributors to make their brands of gasoline include 5% ethanol.

According to Environment Canada emission factors, this measure wil reduce greenhouse gas emissions per litre of fuel by 4.3%.

Implement a Green Policy for the City Vehicle Fleet

Montreal's First Strategic Plan for Sustainable Development has drawn up a green plan for the city's vehicle fleet based on four principles:

1. Choosing the most fuel-efficient engines, adapted to users' needs, when purchasing new vehicles
2. Reducing or limiting equipment that consumes large amounts of energy in fleet vehicles (e.g., air conditioning)
3. Making vehicle users aware of the ecological consequences of their behavior
4. Integrating advanced technology to reduce pollution by vehicles when its cost-effectiveness has been demonstrated.

Appendix 4: Direct responses to Board Member concerns

Person	Comments attributed	Our responses
BOG member	"This university survives because of the investments that are made by the University, in addition to the funding it gets from the government," he said. "Whether you like it or not, Canada is a resource-based company; that's a fact. It's not going to change anytime soon." (http://www.mcgilldaily.com/2013/05/board-of-governors-rejects-divestment-petitions/)	Good returns on investments can be obtained separately from fossil fuel companies, which make up only 10% of global sharemarket. Besides Canada not being a company, because along with over 700 other campaigns, Divest McGill calls for divestment only from the top 200 fossil fuel companies, divestment is moral and achieveable even within the Canadian context. In addition to being immoral, as a bonus medium-term investing in fossil fuel companies is a bad financial decision, given the assets are overpriced - on the unreasonable assumption that unmined reserves will be sold.

CAMSR member	“”If we divest from fossil fuels and everything else, it’s not going to change it, somebody else is going to buy it,” Norris said. “Students might feel great that they’ve divested, but our income goes down, fewer students can come to McGill, and what is the act of the social injury in the oil sands?” (http://www.mcgilldaily.com/2013/05/board-of-governors-rejects-divestment-petitions/) Made similar comments to DM members, strongly criticising financial impact of divestment. She also said: “Perhaps Divest McGill’s arguments might be stronger if they could demonstrate that while they acknowledge that McGill’s action will cost it XX dollars, the empty statement that results will totally be worth the cost of McGill’s consequent inability to fund, for instance, climate-change research.”	Moral hazard argument (her logic is contradicted by McGills actions in relation to cigarette companies, where the same would apply). No evidence fewer students could come to McGill (plus that isn’t CAMSR’s role to make that assessment). Evidence is to the contrary. This submission discusses issues of injury in relation to oil sands in detail. Oxford study shows divestment is far from an empty statement but one of the most effective strategies available. As a bonus, most evidence seems to indicate that divestment will make McGill’s endowment more healthy. Ms. Norris also overestimates the contribution the endowment makes to the overall funding of the university (1%). Its contribution to research is negligible and the impact of divesting on climate-research is even more negligable.

CAMSR report	Need to show specific harm "Divest McGill had presented no evidence of a court finding of injury on the part of oil sands or fossil fuels companies, and otherwise had provided insufficient data and evidence to establish that social injury had occurred." "examples of corporations involved in oil sands and fossil fuels which had been found to have violated or frustrated the enforcement of rules of domestic or international law intended to protect individuals against deprivation of health, safety or basic freedoms".	These were found on unconstitutional actions on page 3 (those that violate treaty rights) and page 9 out of 14 of our first brief. Nonetheless, we appreciate the invitation to discuss environmental harm and be more explicit about other harms. In addition, this submission discusses specific corporations and uses specific cases to demonstrate.
CAMSR report	Existing regulations suffice. "Committee members also took note that the energy sector, including oil and gas extraction, production and distribution, is highly regulated by government at all levels."	Although the fossil fuel industry is subject to regulation, the reality of climate change clearly contradicts this statement. If the industry were sufficiently regulated in this regard, climate change would be impossible. Moreover, this submission discusses in detail the limited and ineffective regulation of the oils sands, with this lack of regulation causing social injury.

CAMSR Member	As renewable energy doesn't have good return, we shouldn't divest.	Divestment from fossil fuel companies does not imply re-investing in renewables specifically. These are two separate decisions. Divestment revenue should be reinvested in anything except fossil fuel companies, of which many are equally profitable. Moreover, the existence of CAMSR process indicates McGill considers some values more important than profits.
Board member	Commented that Divest McGill did not tell the "other side of the story" on behalf of FF companies.	While not required by CAMSR ToR, this reflects an underlying request within BOG for a 'reasonable' approach. We appreciate this comment about the tone of our approach. Nonetheless, we believe it is clear that the business practices of these companies are ultimately unacceptable. Also, fossil fuel companies have significant resources to control the mainstream narrative, as we can see by their pervasive presence; their presence at the Petrocultures conference at McGill, for example.
CAMSR Member	Brenda Norris mentioned that she prepared no other research for board members' consideration	We find this hard to understand. We know many professors who would be willing to help.
Jonathan Mooney (PGSS)	I think the best strategy for those concerned about this issue now is get engaged in the TOR review process.	Now that this is completed, Divest McGill is justified in re-submitting and focusing the request.

CAMSR Member	Objected to "We demonstrated that should the industry burn more than one fifth of its current carbon reserves, it would throw our planet into climate chaos." on the grounds that FF industry will not burn the reserves.	This reflects the importance of precision in our language, and leaving ourselves open to hyperbole. Nonetheless, agreeing to extract anything more than 20% of fossil fuel reserves is unacceptable and harmful. When these extracted fuels are burned—as they certainly would be—it will cause tremendous harm.

A risk of 40-60% of market capitalization comes from an HSBC report: http://www.economist.com/news/business/215770
either-governments-are-not-serious-about-climate-change-or-fossil-fuel-firms-are

http://www.fao.org/publications/sofi/2014/en /

This study also confirms that extreme weather is indeed linked to climate change: Peterson, T., M. Hoerling, P. Stott and S. Herring, Eds., 2013: Explaining Extreme Events of 2012 from a Climate Perspective. Bull. Amer. Meteor. Soc., 94 (9), S1-S74 http://www.noaanews.noaa.gov/stories2013/20130905-extremeweatherandclimateevents.html

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http://iclr.org/images/Telling_the_weather_story.pdf

http://www.canadianunderwriter.ca/news/icy-finish/1002923203/?type=Print%20Archives

For instance, James Hansen of NASA: http://blogs.scientificamerican.com/observations/2011/12/06/two-degree-global-warming-limit-is-called-a-prescription-for-disaster/

"The Social Cost of Carbon." United States Environmental Protection Agency. Accessed February 1, 2015. http://www.epa.gov/climatechange/EPAactivities/economics/scc.html .

http://www2.publicationsduquebec.gouv.qc.ca/dynamicSearch/telecharge.php?type=2&file=/Q_2/Q2_A.htm
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A risk of 40-60% of market capitalization comes from an HSBC report: http://www.economist.com/news/business/215770
either-governments-are-not-serious-about-climate-change-or-fossil-fuel-firms-are

APPENDIX 3: GOVERNMENT ACTION SHOWS THAT CLIMATE CHANGE IS A SERIOUS AND EXPENSIVE PROBLEM

Carbon Tracker. Unburnable Carbon 2013: Wasted Capital and Stranded Assets . 2013.

http://www.carbontracker.org/report/wasted-capital-and-stranded-assets/

A risk of 40-60% of market capitalization comes from an HSBC report:

"Unburnable Fuel" The Economist , May 4, 2013.

http://www.economist.com/news/business/21577097-either-governments-are-not-serious-about-climate-change-or-fossil-fuel-firms-are

Also see: http://divestinvest.org/wp-content/uploads/2014/03/Carbon-Tracker-Top-200.pdf , pp. 19.

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