

# Pension Funds and Fossil Fuels

The Economic Case for Divestment

Marc Lee and Justin Ritchie





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**ABOUT THE AUTHORS**

*Marc Lee* is a senior economist in the B.C. office of the Canadian Centre for Policy Alternatives. For the past six years, he has been the co-director of the Climate Justice Project, a multi-year partnership with the University of British Columbia, funded by the Social Sciences and Humanities Research Council of Canada. Marc has authored and co-authored numerous publications on climate justice, inequality, and public finance, including *Canada's Carbon Liabilities: The Implications of Stranded Fossil Fuel Assets for Financial Markets and Pension Funds* (with Brock Ellis) and *A Green Industrial Revolution: Climate Justice, Green Jobs and Sustainable Production in Canada* (with Amanda Card).

*Justin Ritchie* is a PhD candidate at the University of British Columbia's Institute for Resources, Environment and Sustainability. His work focuses on the role of energy and finance in the macroeconomics applied to developing climate models and forecasts. He is also the director of the Extraenvironmentalist Media Association, a not-for-profit organization that produces podcasts, videos, and educational resources on energy, environment, and economics.

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5	<b>Summary</b>
	Climate Policy Risks for Pension Funds
	Other Risk Factors for Pension Funds
	Fiduciary Duty in a Warming World
	What Are the Alternatives?
10	<b>1. Why All the Fuss About Divestment?</b>
14	<b>2. Climate Change and Canada’s Fossil Fuel Reserves</b>
	A Global Carbon Budget
	Are We in the Midst of a “Carbon Bubble”?
18	<b>3. Climate Policy Risk and Stranded Assets</b>
22	<b>4. Commodity Price Risk</b>
24	<b>5. Other Risks from Fossil Fuel Holdings</b>
	Energy Innovation
	Carbon Liability
	First Nations and Community Opposition
29	<b>6. Fiduciary Duty in a Warming World</b>
33	<b>7. What Are the Alternatives?</b>
35	<b>Conclusion</b>
37	<b>Appendix</b>
40	<b>Notes</b>



# Summary

THIS REPORT IS aimed at informing pension fund trustees about the risks associated with fossil fuel investments, and for interested workers who want to better understand what their pension money is up to, and how to ask the right questions.

Divestment campaigns have become a prime focus for organizing and movement-building on climate change, targeting university endowments, churches, foundations and pension funds. While the movement is primarily driven by a moral imperative — that if it's wrong to wreck the climate, it's wrong to profit from that wreckage — there are also important economic arguments for divestment.

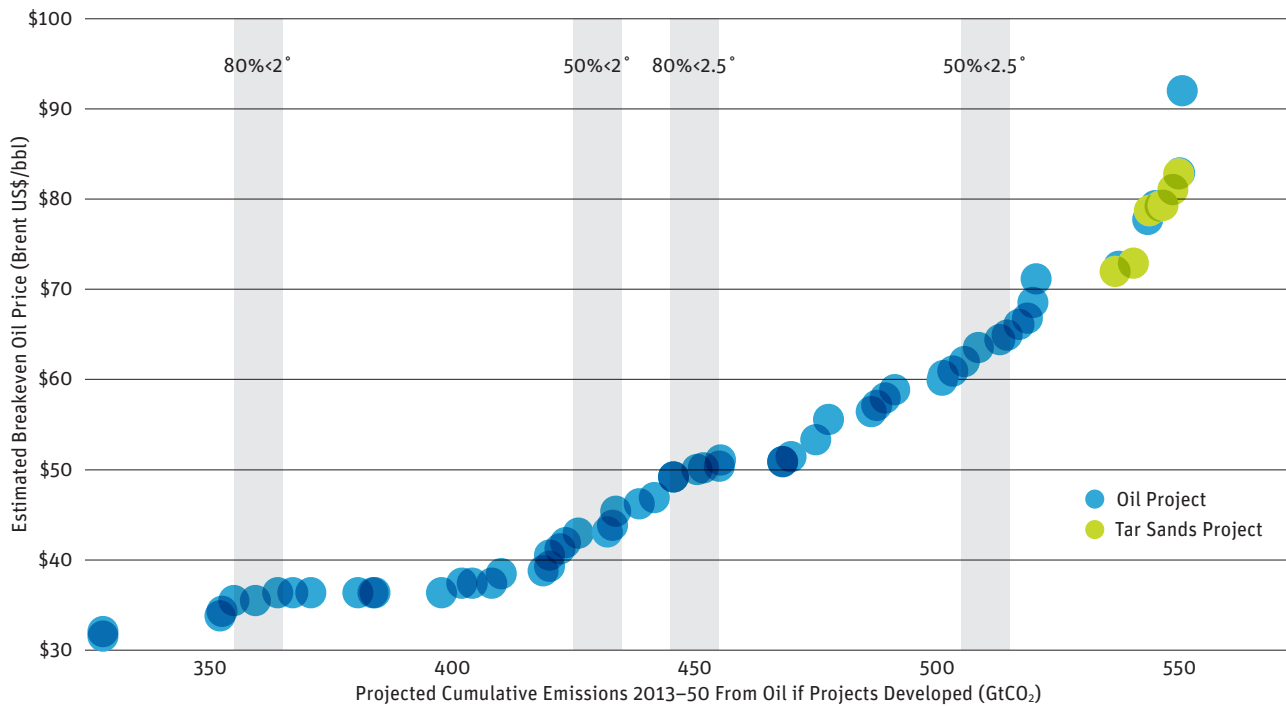
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## Climate Policy Risks for Pension Funds

Carbon pollution, primarily caused by the human use of fossil fuels, is accumulating in the atmosphere, leading to increased global temperatures and changing climate patterns. An important concept in climate science is that of a *carbon budget* — a finite amount of fossil fuels that can be combusted before committing to dangerous levels of global warming. Recent estimates conclude that between  $\frac{2}{3}$  to  $\frac{4}{5}$  of proven fossil fuel reserves (those already near development) thus represent “unburnable carbon.”

To illustrate the implications, we develop a cost-curve ranking future oil production around the world from lowest to highest cost, mapped against

**FIGURE 1** Carbon Supply Curve for Global Oil Projects



Source Adapted from Citibank (2013), Carbon Tracker (2013) and IPCC 5<sup>th</sup> Assessment Report (2014)

various estimates of a global carbon budget. In a world of constrained carbon, the lowest cost reserves are likely to be developed first. Canada is a relatively high-cost producer, with Canadian heavy oil projects (in green) requiring a breakeven price of \$70–\$85 per barrel to be financially sustainable over the long-term. Meaningful climate policies thus imply a large share of Canada’s bitumen reserves cannot be developed.

Institutional investors, including pension funds, are becoming increasingly aware that fossil fuel company business models are not compatible with a habitable planet. In our review of Canadian public pension fund annual reports, however, action on climate change was not mentioned as a material risk to pension sustainability.

Integrating an understanding of climate policy risk that includes the potential for new regulations, carbon pricing, emission caps and unburnable carbon reserves is a logical next step for the conversation on sustainability within public sectors pensions.

Limitations on disclosure inhibit our ability to precisely state this risk for many Canadian pension funds (we cite a few examples where disclosure is

better, and we make some estimates for other large funds in an Appendix). Nonetheless, we conclude that Canadian pension funds are exposed to climate policy risks from their holdings of fossil fuels.

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## Other Risk Factors for Pension Funds

In addition to climate policy risk, fossil fuels holdings could become *stranded assets* for a range of factors:

*Commodity price risk* – The collapse of oil prices since mid-2014 provides a cautionary tale. With continued low commodity prices, expensive reserves forming the next phase of expansion in Alberta’s north will remain undeveloped. These dynamics are similar to the climate policy risks above, with the key difference that an agreement to meaningfully constrain emissions would have deeper and permanent impacts on valuations.

*Energy innovation risk* – Renewables are increasingly front and centre. A remarkable story in recent years is that the cost of new renewable electricity generation in many parts of the world is now about the same or less than building new fossil fuel plants. In addition, energy efficiency and conservation are low-cost means of meeting new energy demand.

*Carbon liability risk* – The link between carbon emissions and damages is evolving, and it is possible that in the future fossil fuel producers will be held liable for damages, in the same way that tobacco companies have been sued for health damages resulting from use of their product. By precisely defining the statistical share of a particular company’s contribution to climate change, new research has raised the possibility of assigning similar shares when damages are assessed.

*First Nations and community opposition risks* – Fossil fuel megaprojects are facing greater scrutiny than ever before. It has become the norm to ask whether a project has “social license” to proceed. Examples include delays or rejection of pipelines, coal port expansion and liquefied natural gas terminals, with First Nations opposition playing a particularly prominent role due to constitutionally-protected rights and title.

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## Fiduciary Duty in a Warming World

We believe these 21<sup>st</sup> century risk factors for holding fossil fuel assets have not been adequately addressed by Canada's pension funds, and they merit coherent and well-thought-out responses. What is clear is that the range of risks facing fossil fuel companies has become much more pronounced in recent years.

Indeed, the growing momentum of divestment itself may be a risk factor. If a critical mass of the population come to agree that getting off fossil fuels is a moral imperative, this conviction raises the bar for what government can and will do to regulate and cap emissions. Further, it changes the parameters of acceptable behaviour in the financial marketplace. To the extent this movement is successful, it reinforces all of the risk factors above, making stranded asset risk more likely, as fossil fuels increasingly become off-limits to wide swaths of investors.

A warming world implies changes in the approach to fiduciary duty. Because of the long-term planning horizons of pension funds, inter-generational arguments consistent with those raised by climate change should be viewed as a non-trivial matter. Funds must equally represent the interests of young workers for their eventual retirements. Presently, their models assume, implicitly or explicitly, an uninterrupted expansion of Canada's oil industry.

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## What Are the Alternatives?

Given the major role played by pension funds in the financial system, we see a role for funds to up their climate game. Divestment from fossil fuels is consistent with fiduciary duty, but funds can and should also play a transformative role in building and scaling up the green infrastructure needed for a zero-carbon world. Infrastructure requires up-front capital investment with a return paid out over decades — which aligns well with the needs and long-term horizons of pension funds.

A wide range of alternative options is available. These will grow substantially in the face of more stringent climate policies, but pension funds could also play a role by strategically allocating capital in support of green infrastructure, with returns comparable to those from fossil fuel investments. A great deal of infrastructure investment will be required from the public sector. Green bonds have become a means of packaging certain types of infrastructure investments, raising \$1.3 billion in Canada in 2014 after almost nothing in 2013. Some private sector options also represent innovative alternatives.



For pension fund trustees and concerned plan members, it is our hope that our review of these issues will spark a new conversation. In particular, we would highlight:

1. *Disclosure:* Members and trustees should press for detailed disclosure of pension fund portfolios, so that there is daylight on holdings.
2. *Carbon stress testing:* In the face of the risks we have outlined, fund managers and trustees should be required to justify continued fossil fuel investments, clarify the risks associated with fossil fuel holdings and develop criteria to evaluate best and worst performers.
3. *Engagement:* Pension trustees should be asking pointed questions of fossil fuel companies about their capital investment plans moving forward, in the light of climate science and future constraints on carbon.
4. *Divestment and re-investment:* Pension funds should develop a process for divestment, and removal of high risk companies from portfolios, minimally aimed at coal and tar sands stocks but ideally sector-wide. This should also include a process for re-investment – shifting funds to other areas of the economy and to strategic green infrastructure investments.

# 1. Why All the Fuss About Divestment?

THIS REPORT LOOKS at fossil fuel divestment and Canadian pension funds. It is aimed at informing pension fund trustees about the risks associated with fossil fuel investments, but will also be of interest to workers who want to better understand what their pension money is up to, and how to ask the right questions. We hope to disentangle the complexity at the intersection of climate science and policy, economics, finance, and pension planning.

Fossil fuel divestment has become an important topic in Europe, the United States, and Canada. The divestment movement, which was started in mid-2012 by Bill McKibben and 350.org, has grown quickly in three years' time. Students have led the way by targeting university endowments; churches have followed suit, and now large foundations and pension funds are joining in (see sidebar).

To date, the total amount divested is but a drop in the bucket in terms of global finance. Nonetheless, divestment campaigns have become a focus for organizing and movement building on climate change. They have successfully broadened conversations about the need for climate action, and the relationship between large pools of capital and a fossil fuel industry whose business model is at odds with a habitable planet.

The fossil fuel divestment movement is primarily driven by a moral imperative — that if it's wrong to wreck the climate, it's wrong to profit from that wreckage. The Pope's May 2015 encyclical letter, *Laudato Si* (On Care

for Our Common Home), took the moral case for action to new levels.<sup>1</sup> These powerful ethical arguments speak to our being at a carbon crossroads, while making a connection to past divestment movements, such as the successful campaign against apartheid-era South Africa, as well as other ethical investment policies that shirk, for example, military or tobacco stocks.

In addition to moral arguments, there is also an important economic case for divestment, which we consider in this report. Some institutional investors have not publicly supported divestment, instead stating a preference to seek change from within by virtue of having a seat at the table. In October 2013, a group of 70 pension funds and investors, with \$3 trillion in combined assets, formally asked the 45 major fossil fuel companies to justify their capital expenditure plans in the face of climate change. Whether through engagement or divestment, all pension funds should ensure they are having meaningful conversations about the risks associated with fossil fuel holdings.

It is our impression that Canadian pension funds are living a form of climate denial — a bet against action being taken by governments to seriously address climate change. Such bets make short-term sense in that the fossil fuel industry has ferociously protected its profit streams through political influence and climate denial campaigns. The federal government and almost all provincial governments remain committed to fossil fuel extraction and export. The media have generally failed to connect the dots between climate change and the financing of specific industry developments. And while the crash in oil prices has been a wake-up call in some quarters, in others it is business as usual, as many wait and hope for a return to high commodity and energy prices.

This report builds on research from a 2013 Climate Justice Project report, *Canada's Carbon Liabilities: The Implications of Stranded Fossil Fuel Assets for Financial Markets and Pension Funds*, which identified Canadian pension funds as an area of concern, given their significant role in the net worth of middle class households.<sup>2</sup> That report found pension funds have systematically ignored the implications for their portfolios of meaningful climate action. It also put some numbers to the fossil fuel reserves in Canada held by 114 publicly-traded companies, and the potential emissions and damages should they be exploited.

We review these economic risks below, and add some new analysis of interest to Canadian pension funds and their six million members. Developments in 2014 revealed the weakness in national and provincial plans for betting prosperity on perpetual growth of fossil fuel exports and infrastruc-

## Developments Around Fossil Fuel Divestment

Even in its early days, fossil fuel divestment was called “the fastest growing divestment movement in history.”<sup>3</sup> Hundreds of campaigns are underway around the world at various institutions. A recent report found “436 institutions and 2,040 individuals across 43 countries and representing \$2.6 trillion in assets have committed to divest from fossil fuels...a fifty-fold increase [in one year] in the total combined assets of those committed to divest from fossil fuels.”<sup>4</sup>

Here are some highlights of the divestment movement’s recent successes:

In May 2015, Norway’s parliament directed the country’s much-admired sovereign wealth fund to divest from companies that derive greater than 30% of their revenues or power production from coal. This would affect approximately 75 companies worth US\$4.5 billion.<sup>5</sup> The nation’s capital, Oslo, announced in October 2015 that it will divest its public pension fund from companies producing oil and gas.<sup>6</sup>

These moves follow Sweden’s national pension fund, which divested from 20 companies (12 coal and eight oil and gas) in October 2014. To justify the US\$116 million divestment, the Second AP Fund stated it had “identified a number of companies featuring substantial exposure in high-cost projects, such as oil-extraction from oil sands. The Fund believes these companies face serious climate-related financial risks and that it is highly likely that these projects may either be stranded or unprofitable.”<sup>7</sup>

In September 2015, the state of California ordered its US\$476 billion public pension funds, the California Public Employees’ Retirement System (CalPERS) and California State Teachers’ Retirement System (CalSTRS), to divest from companies deriving at least half of their revenues from coal mining.<sup>8</sup> The University of California system went even further, divesting US\$200 million worth of coal and oil sands companies from its endowment and pension fund holdings.<sup>9</sup>

The United Kingdom has been a hotbed of activity, including divestments from the Quakers, the British Medical Association, and Prince Charles (among others). The Guardian Media Group divested its holdings of fos-

ture, and the assumption of a continued price environment high enough to fuel expansion. The shock woke Canadians up to another reality: Canada is fundamentally affected by decisions made outside its borders, be it Saudi Arabian oil production levels, denial of the Keystone XL pipeline, or a global carbon treaty. We consider these risk factors in the following sections.

oil fuels, and has taken up a divestment campaign with daily stories on the movement and fossil fuel corporations. One key demand of the campaign is that the Bill & Melinda Gates Foundation and the Wellcome Trust divest their holdings.

Oxford University ruled out investing in coal and tar sands. Stanford and Georgetown universities are divesting from coal, while the School of Oriental and African Studies at the University of London, Glasgow University, Australian National University, Victoria University (New Zealand), the New School (New York City), and Syracuse University have all divested from fossil fuels.

Faith organizations have rallied to the call for divestment. In May 2015, the Church of England approved divestment of \$20 million in tar sands oil and thermal coal.<sup>10</sup> The World Council of Churches, the Unitarian Church, and the Church of Sweden have announced divestments. Many more are discussing and debating the topic.<sup>11</sup> In August 2015, the United Church of Canada agreed to sell off its holdings of the 200 largest fossil fuel companies, a divestment of \$6 million (4.7% of its portfolio).<sup>12</sup>

The Rockefeller Brothers Fund delivered a particularly notable divestment, representing part of the vast Rockefeller fortune garnered from Standard Oil's dominance a century ago. In October 2014, the fund announced immediate divestment from tar sands and coal, gradual withdrawal from oil and gas, and investment of 10% of the endowment in clean energy.<sup>13</sup>

At the municipal level, San Francisco and Seattle have announced divestments, as has the city of Oxford, U.K. And Vancouver is engaging the B.C. Investment Management Corporation (which manages the province's public sector pension funds) about how it is considering climate risk and carbon budgets in its investment portfolio. In the same city, Vancity credit union announced a new mutual fund product that will not invest in fossil fuel producers. The IA Clarington Inhance Global Equity SRI Class, which uses Vancity subsidiary Vancity Investment Management (VIM) as a subadvisor, divested the approximately 3% of its holdings in fossil fuel companies.<sup>14</sup>

## 2. Climate Change and Canada's Fossil Fuel Reserves

AT ITS CORE, global warming, or climate change, is the result of too much carbon dioxide accumulating in the atmosphere, leading to increased global temperatures and changing climate patterns. This carbon pollution is primarily caused by the human use of fossil fuels – taking carbon out of the ground in the form of coal, oil, and natural gas and combusting it for our energy needs. Extreme weather, oil spills, and other damages from extreme energy development have been estimated at more than US\$1.2 trillion per year in global damages.<sup>15</sup>

There is a direct linkage between the amount of carbon in the atmosphere and eventual temperature increase. There is widespread agreement that global warming of more than two degrees Celsius (2°C) above pre-industrial levels (about 200 years ago) is considered to be a danger zone, with potentially catastrophic and irreversible outcomes for human civilization. These outcomes are likely to be experienced unevenly, with many low-income countries facing the greatest threats from climate change, but no country will be immune.

The World Bank concluded that business as usual has humanity headed for a 4°C warmer world, “one of unprecedented heat waves, severe drought, and major floods in many regions, with serious impacts on ecosystems and

associated services.”<sup>16</sup> This is a recipe for political conflict, food and water shortages, adverse health impacts, and mass migrations.

Keeping temperature increases below 2°C is the official target for international climate negotiations. Through 2015, much attention has been paid to talks seeking to land a new global treaty to constrain carbon emissions, to be signed in Paris in December. Whether or not those talks are successful, or sufficiently ambitious to meet the 2°C target, the growing awareness of climate-related damages suggests it is only a matter of time before meaningful climate policies are adopted.

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## A Global Carbon Budget

The *carbon budget* is an important concept in climate science. It refers to the finite amount of fossil fuels that can be combusted before committing to 2°C of warming. Recent estimates of the size of that global carbon budget conclude that between two-thirds and four-fifths of proven fossil fuel reserves (those already near development) represent “unburnable carbon.”<sup>17</sup> This means business as usual for the fossil fuel industry is incompatible with action to address climate change.

How this would translate to the national or subnational level is not completely clear. Constraints on Canada’s carbon use and export industries would be negotiated and politically determined. That said, because of Canada’s reliance on fossil fuels for domestic energy, and as major exporter of fossil fuels, Canada will likely be disproportionately and negatively affected by climate policies that successfully keep carbon in the ground.

To put this in context consider that Canada’s proven fossil fuel reserves, if combusted, would release 96.7 billion tonnes of carbon dioxide — three years’ worth of global emissions. In the broader category of proven-plus-probable reserves, total exploitation of reserves would release 174 billion tonnes of CO<sub>2</sub>.

Moreover, Canada’s reserve profile overall is heavily weighted to tar sands (bitumen) and coal, which are considered the dirtiest fossil fuels, and are more likely to be stranded by a carbon-constrained world.<sup>18</sup> Consider also the large differences in the cost of getting various reserves to market. Canada is a high-cost producer, with a very large portion of high-cost oil reserves (above \$80 per barrel breakeven) in the Alberta tar sands.

Combining research on a global carbon budget and the economic costs of production, a recent study concluded that 88% of the world’s proven

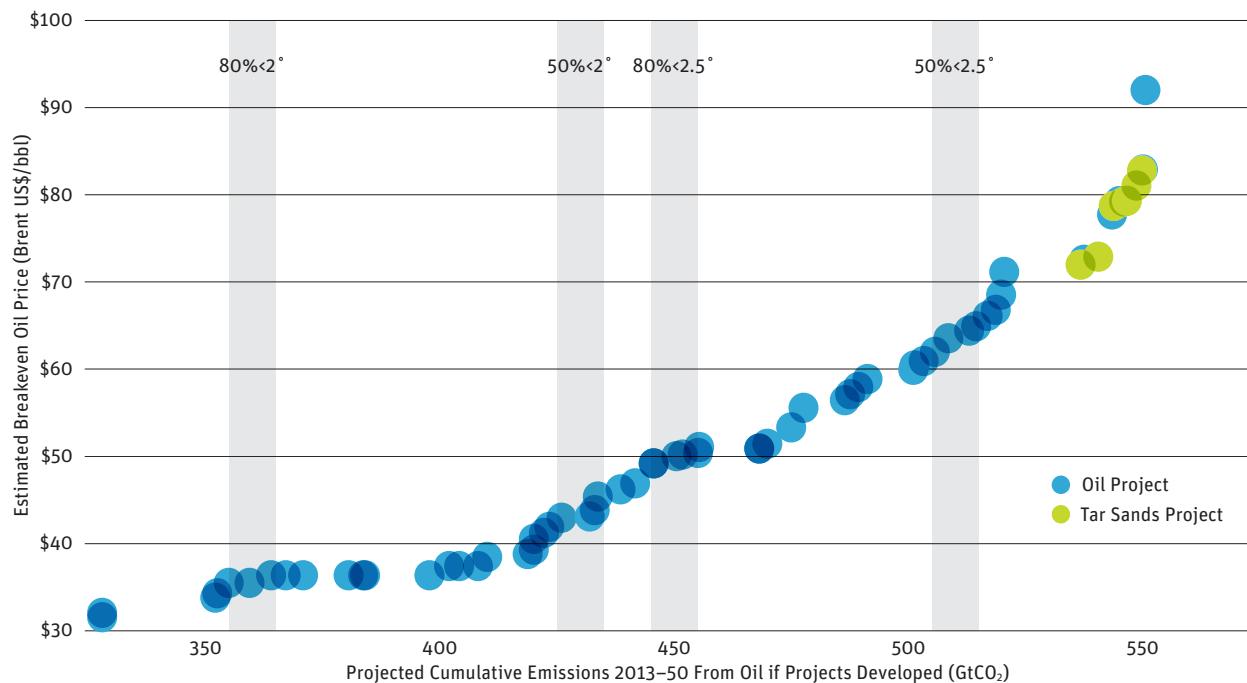
## Canadian Oil Sands Reserves Vs. The Global Carbon Budget

Canada's place in the hierarchy of fossil fuel reserves can best be illustrated on a cost curve ranking the lowest- to highest-cost producers. Figure 1 draws on research from Citigroup and Carbon Tracker on breakeven costs for new oil projects.<sup>22</sup> The lowest-cost producers represent conventional oil production, followed by new ranks of unconventional projects such as deepwater and shale oil. The highest-cost sources include Canadian heavy oil projects, with a required breakeven price of \$70–\$85 per barrel, much higher than other supply options.

Along the bottom axis are measures of oil production associated with these developments and their translation into CO<sub>2</sub> in the atmosphere. The grey bands show recent estimates for a global carbon budget at different probabilities. The first band represents an 80% chance of staying below 2°C of warming, followed by a 50% chance, then an 80% chance of staying below a 2.5°C rise in temperature, and finally a 50% chance of meeting that second target.

In a world of constrained carbon, demand for fossil fuels will be reduced, lowering the price of oil. In this new economic context, the lowest-cost reserves will be developed first. We conclude that full development of Canada's proven reserves could only occur en route to a world where global temperatures are much higher than 2°C above pre-industrial levels. Meaningful climate policies, on the other hand, imply that a large share of Canada's bitumen reserves cannot be developed.

**FIGURE 1** Carbon Supply Curve for Global Oil Projects



Source Adapted from Citibank (2013), Carbon Tracker (2013) and IPCC 5<sup>th</sup> Assessment Report (2014)



coal reserves, 52% of gas reserves, and 35% of oil reserves must remain unburned.<sup>19</sup> As a high-cost oil producer, 75% of Canada's proven oil reserves must stay underground, according to the study, while 82% of Canada's coal reserves and 24% of gas reserves are similarly unburnable. Bitumen is singled out, with 85% of reserves unburnable, and if we consider a broader category of recoverable resources (aka proven-plus-probable reserves), an astonishing 99% is unburnable.

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## Are We in the Midst of a “Carbon Bubble”?

The idea that a “carbon bubble” sits underneath the valuations of oil and gas companies was launched into public awareness by the U.K.-based Carbon Tracker Initiative in 2011. The logic was amplified and popularized by environmentalist Bill McKibben in a July 2012 *Rolling Stone* article, which launched the global fossil fuel divestment campaign.<sup>20</sup>

This new thinking has sparked concern at the highest levels. In late 2014, Mark Carney, who heads the Bank of England, publicly acknowledged the possibility of a carbon bubble, stating “the vast majority of reserves are unburnable” if we are to avoid catastrophic climate change.<sup>21</sup> The results of a Bank of England investigation into the risk of a carbon bubble are expected before the end of 2015.

In Canada, the Toronto Stock Exchange (TSX) is highly weighted toward the fossil fuel sector, which makes up about one-quarter of the total value of the S&P/TSX 60 Index. These stocks would lose value under a new global climate regime, with adverse impacts on individual and institutional investors. This raises the issue of systemic risks to the financial system, as a large and permanent drop in asset values would have a negative impact on balance sheets across the country, and thus have broader economic consequences for Canada.

The recent experience with high-tech and housing bubbles should serve as a warning to policy-makers. In 2008, the collapse of a housing bubble threatened the global financial system as a whole. Extraordinary measures to bail out banks and stimulate national economies had to be taken, and the global economy is still reeling many years later. The financial crisis also adversely affected many pension funds and, by association, the retirement security of pensioners and future retirees.

# 3. Climate Policy Risk and Stranded Assets

BECAUSE PUBLIC SECTOR pensions play a critical role in providing financial security to millions of Canadians, fund managers and trustees emphasize a long-term perspective. Forecasts for the financial sustainability of pensions draw on detailed academic and professional research to calculate risks. These models include forecasts of trends in demographics, asset allocation, consumer choice, and the macroeconomic landscape. These are prudent considerations carried out against a backdrop of fiduciary obligations.

While many pension funds are beginning to use models to understand the impacts of climate change, these projections have typically focused on the costs of increasingly erratic weather, disaster mitigation, and the other consequences of a warming planet that could pose risks to investments. For example, since pension funds regularly invest in infrastructure lasting for multiple decades, these projects might consider the impacts of rising sea-levels on the coast, or flooding if near a waterway.

In our review of the annual reports of pension funds, we found no mention of how international action on climate change poses a material risk to pension sustainability. Canada's actuaries have yet to measure and address climate risks to pension funds in their analyses. Integrating an understanding of climate policy risk that includes the potential for new regulations, carbon pricing, emission caps, and unburnable carbon reserves is a logical next step in the conversation on sustainability within public sector pensions.

Moving forward, pension funds need to thoroughly investigate the risk of stranded assets. These are defined as: “fossil fuel energy and generation resources which, at some time prior to the end of their economic life (as assumed at the investment decision point), are no longer able to earn an economic return (i.e., meet the company’s internal rate of return), as a result of changes in the market and regulatory environment associated with the transition to a low-carbon economy.”<sup>23</sup> HSBC Bank comments that “oil sands face the greatest stranding risks...given the combination of high breakeven prices and higher carbon intensity of production.”<sup>24</sup>

Leading institutional investors have started to challenge fossil fuel companies to justify their capital investment plans in the face of climate science and carbon budgets. In fall 2013, London-based Carbon Tracker and Boston-based Ceres submitted a request on behalf of institutional investors (with collectively more than US\$3 trillion in assets) to 45 major oil, gas, coal, and electric utility companies. It outlined concerns about stranded asset risks, and called on these energy companies to explain how their business plans would fare in low-carbon transition scenarios.<sup>25</sup>

The response was disappointing, and suggests climate action will most certainly not come from fossil fuel producers. In March 2014, ExxonMobil was the first company to respond, stating the company was confident that none of its hydrocarbon reserves would become stranded because their production would be essential to meeting global energy demand worldwide. Shell followed in May that year with a similar response. In effect, these companies are betting that governments will not act to constrain carbon, at least not within the timeframe of their multi-decade investments.<sup>26</sup>

Limitations on disclosure inhibit our ability to precisely state the risk for various Canadian pension funds. In the case of private funds, there may be no information available publicly, while public funds report the share of the fund across different broad categories like stocks or bonds. For many funds we can only discern total share in equities (stocks of companies). If we assume the funds invested are roughly in line with the TSX, we estimate the top 20 public pension funds have around 4–9% of their funds invested in fossil fuel stock (see Appendix). More extensive public disclosure requirements should be required by regulation.

The British Columbia Investment Management Corporations (bcIMC), which manages pension funds for the B.C. public sector, provides detailed public information about its holdings (in the aggregate, not for its sub-funds like the Municipal Pension Plan).<sup>27</sup> This disclosure lists the investments managed in each asset class, across equities, fixed-income investments, mort-

## What About the Canada Pension Plan?

Although it is a very different fund than the pension funds discussed above, the Canada Pension Plan (CPP) also merits a mention. The CPP is one leg of Canada's retirement savings system, whose beneficiaries are retirement-aged Canadians who have paid in to the plan through premiums during their working years.

About one-third of the CPP's assets are invested in publicly-traded equities. Based on previous CCPA research, we know about 22% of Canadian equities and 6% of foreign equities are fossil fuel producers or pipeline companies.<sup>31</sup> These shares are higher than our estimated shares for pension funds, and thus the CPP is more exposed to climate policy risk.

The CEO of the Canada Pension Plan, Mark Wiseman, stated an intent in early 2015 to use the oil price crash as an occasion to recapitalize Canadian companies that could otherwise go bust due to low oil prices, or even to invest more in fossil fuel companies. "I don't think we'd go buy Exxon, but we might buy a piece of Exxon if it were for sale," Wiseman said in an interview.<sup>32</sup>

gages, real estate, private equity, infrastructure, and so forth.<sup>28</sup> Equities account for about half of bcIMC's holdings, with 14.6% of those in oil and gas, and another portion in electricity generation linked to fossil fuels. In total, about 8% of bcIMC's total holdings are exposed to fossil fuel companies.

Based on their publicly-available data, both the New Brunswick Investment Management Corporation and the Public Employees Pension Plan in Saskatchewan similarly have approximately 8% of their respective funds exposed to fossil fuel equities.

In addition to diminished stock prices, pension funds also face risks from holdings of corporate bonds from fossil fuel companies, electricity companies with coal-fired generation assets, infrastructure investments in pipelines, and other indirect channels. For example, at least 25% of Canada's \$360-billion corporate bond market is debt for oil and gas companies.<sup>29</sup> Pension funds can also take on stranded asset risks through their investments in private equity vehicles, which make their own investments in fossil fuel assets. Based on available public information, we estimate such investments range from 4–14% of holdings.<sup>30</sup>

We can conclude that Canadian pension funds are exposed to climate policy risks from their holdings of fossil fuels. Because of "home bias" in investments, this is a significant stranded asset risk for Canadian pension funds holding Canadian fossil fuel stocks (although the risks apply to holdings of foreign fossil fuel stocks as well). On the other hand, diversifica-

tion across different investment types and industries diminishes the potential losses when seen from the entirety of the fund. In this sense, a smaller share of holdings in fossil fuel stocks suggests that divestment need not be a daunting process for pension funds.

## 4. Commodity Price Risk

THE COLLAPSE OF oil prices since mid-2014 provides a cautionary tale. Higher prices for oil during the first part of the 21<sup>st</sup> century provided cover for nations with unconventional resources, including the oil sands in Canada, the shale oil of the United States, and deepwater resources across the world.

When the West Texas Intermediate (WTI) benchmark price for oil was at US\$108 per barrel on June 30, 2014, the total market capitalization of TSX-listed oil and gas companies was roughly \$600 billion. By December 31, as WTI dipped under US\$54 per barrel, the market valuation for these companies had fallen 23% in just six months, with about \$140 billion of market capitalization vaporized. Oil and gas companies listed on U.S. exchanges fell from an aggregate market cap of US\$5 trillion to US\$3.8 trillion during this time, a 24.5% decline.

Canada's 20 largest public sector pension funds (noted in previous section and in the Appendix) had estimated holdings of approximately \$27 billion in fossil fuel company stock prior to the commodity price fall. This translates into losses of approximately \$5.8 billion, a conservative estimate based on equities only, which ignores losses on corporate bonds and fixed income investments, or other indirect holdings.

Oil and stock prices had recovered somewhat by mid-2015, but were back below \$50 in November. Such are the booms and busts of commodity markets, with ongoing sentiments that commodity and energy prices will rise once again, as they have in the past. The price environment has contributed to a major investment slowdown, as new megaprojects are not economic

at current prices. However, production levels remain relatively high, since the most significant costs are past investments in fixed capital; companies can still make a profit if they can cover operating costs.

These dynamics are important for the carbon risks noted above, with the key difference here that an agreement to meaningfully constrain emissions would have deeper and permanent impacts on valuations. Though a range of perspectives are developing on how the resource rents and market valuations of oil and gas companies would be impacted from various carbon budget scenarios, it seems likely that, especially in the short term after a strict carbon policy announcement, investors would suffer losses as the new landscape for investing in fossil fuel-based energy was bounded by dramatically new expectations.<sup>33</sup>

With continued low commodity prices, the expensive reserves that would otherwise form the next phase of expansion in northern Alberta will remain undeveloped. A recent report from Canadian oil and gas analyst CanOils, based on the firm's database of industry financial performance, projects that less than 20% of leading Canadian oil and gas companies will be able to cover full lifecycle costs of development amid a prolonged period of oil prices at US\$50 per barrel. Even \$60-per-barrel oil would produce a steep decline in expansion and exploration.<sup>34</sup>

## 5. Other Risks from Fossil Fuel Holdings

THE RISK OF holding fossil fuel stocks is not limited to potential climate policies that constrain carbon, or to erratic commodity prices. Pension funds need to assess a range of other stranded asset risks related to carbon and fossil fuels, including the effect of energy innovation, carbon liability litigation, and resistance to current and future projects by First Nations and other affected communities.

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### Energy Innovation

In rejecting the idea of a carbon bubble, Shell and Exxon asserted their belief (hope) that global demand for energy will continue to increase for the foreseeable future. While this may well be the case, there is no guarantee that future demand will be met by fossil fuels.

The cost of renewable electricity generation in many parts of the world is now about the same or less than fossil fuel-based energy (e.g., gas- or oil-fired power plants).<sup>35</sup> Mark Jacobson and Mark Delucci of Stanford University argue it would be technically possible to provide all of the world's energy with renewable sources (wind, water, and solar technologies, with no nuclear or biomass) by 2030,<sup>36</sup> and they have been articulating state-by-state energy transition case studies for the U.S.<sup>37</sup> Bloomberg New Energy



Finance estimates the falling cost of solar will make utility-scale solar projects competitive with fossil fuels around the world in just over a decade.<sup>38</sup>

It is widely known that energy efficiency and conservation are low-cost means of meeting new energy demand. That is, we can provide greater energy services to a growing population by using existing energy much more efficiently. This includes high-efficiency new buildings and retrofits, great improvements in industrial energy efficiency, improved transportation efficiency, and so forth.

A 2015 report by HSBC Bank highlights the role of energy innovation in renewables and more efficient processes that could lead to fossil fuel assets becoming stranded.<sup>39</sup> The bank estimates Europe has already started decoupling economic growth (GDP) from growing energy demand due to aggressive energy transition policies. HSBC also notes the advent of other disruptive technologies including better battery storage, which will enhance the scalability of more intermittent renewables, and enhanced oil recovery, which re-pressurizes old wells, enabling a greater share of the total resource to be recovered.

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## Carbon Liability

A previous CCPA report developed a database of 114 fossil fuel companies operating in Canada — 103 listed on the Toronto Stock Exchange (assets greater than \$70 million for oil and gas, and \$50 million for coal), and 11 foreign-owned subsidiaries.<sup>40</sup> For each, financial data on revenue, assets, and market capitalization was compiled, plus data on fossil fuel reserves (proven and probable), which was converted into potential CO<sub>2</sub> emissions.

Using a range of estimates for the damages associated with emitting a tonne of carbon (known as the social cost of carbon, based on recent literature), the report estimated the total damages that could result from exploitation of those reserves. These potential damages vastly exceeded the market capitalization and assets of Canadian-listed companies, and in the case of foreign-owned subsidiaries the high estimate of carbon liabilities for Canadian reserves exceeded their market capitalization based on operations worldwide.

Bank of England Governor Mark Carney also recently raised the issue of liability when he singled out: “impacts that could arise tomorrow if parties who have suffered loss or damage from the effects of climate change seek compensation from those they hold responsible. Such claims could come

decades into the future, but have the potential to hit carbon extractors and emitters — and, if they have liability cover, their insurers — the hardest.”<sup>41</sup>

The link between emissions and damages is evolving. It is possible that, in the future, fossil fuel producers will be held liable for damages in the same way that tobacco companies have been sued for health damages resulting from use of their products. A 2013 study traced two-thirds of all carbon emissions since 1750 to just 90 corporate entities, 50 of which are investor-owned entities.<sup>42</sup> By precisely defining the statistical share of each company’s contribution to climate change, this research raised the possibility of assigning similar shares when damages are assessed. For example, if sea level rise causes \$1 billion worth of damages in a country, and Chevron is responsible for 3.52% of historical GHG emissions, in theory Chevron could be asked to pay \$35.2 million toward those damages.

A 2014 Climate Justice Project report by Andrew Gage and Michael Byers considered legal avenues, including transnational litigation, by which compensation for damages may be sought. The authors concluded:

The potential for climate damages litigation is global in scope. Cases could be brought in a large number of countries, under a wide range of legal theories, then enforced in Canada or other countries in which greenhouse gas-producing companies have assets. As a result, these companies and their shareholders are exposed to significant legal and financial risks—and these risks will only grow.

Although currently there may not be any single jurisdiction in which a climate damages award is imminent, the sheer number and diversity of venues, and means through which such litigation might be successful, suggest that civil liability is likely, particularly as the costs associated with climate change rise. The likelihood will only increase if, as also seems likely, countries severely impacted by climate change adopt legislation that removes legal hurdles to climate liability.<sup>43</sup>

In a recent development, the New York Attorney General has launched an investigation of Exxon Mobil for financial fraud — to determine if the company lied to the public about the risks associated with climate change and the associated business risks to the company. According to Brandon L. Garrett, a professor at the University of Virginia law school: “This could open up years of litigation and settlements in the same way that tobacco litigation did, also spearheaded by attorneys general.”<sup>44</sup>

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## First Nations and Community Opposition

Fossil fuel megaprojects are facing greater scrutiny than ever before. It has become the norm to ask whether a project has the “social license” to proceed. There is no commonly accepted definition for what that term means in practice, but it encompasses the notion that people who may be adversely affected by fossil fuel infrastructure need a voice, and to be properly consulted and accommodated, with the ability to say no in some cases.

In North America, opposition has so far prevented the launch of new bitumen pipelines. In November 2015, TransCanada’s proposed Keystone XL pipeline through the United States was rejected by President Obama. This decision is of particular import as it was made on climate change grounds.<sup>45</sup>

Enbridge’s Northern Gateway pipeline through Northern B.C. was approved by the Conservative government in 2014, but this decision is most likely to be overturned by the new Liberal government. In any event, the pipeline was widely believed to be doomed due to rigid First Nations opposition. In October 2015, eight BC First Nations began a court challenge against the federal government’s decision to approve Northern Gateway.<sup>46</sup> The case will be fundamental to the future of pipelines in the context of First Nations rights and title.

Opposition from First Nations and municipal governments to Kinder Morgan’s pipeline expansion from Alberta to the B.C. coast near Vancouver is also strong (official approval process is still underway). The 2013 *Save the Fraser Declaration*, signed by 130 B.C.-based First Nations unified in their opposition to bitumen pipelines, is considered to be indigenous law. The declaration states:

[I]n upholding our ancestral laws, Title, Rights and responsibilities, we declare: We will not allow the proposed Enbridge Northern Gateway Pipelines, or similar Tar Sands projects, to cross our lands, territories and watersheds, or the ocean migration routes of Fraser River salmon.<sup>47</sup>

The Tsleil-Waututh First Nation in North Vancouver has also issued a submission to the National Energy Board rejecting the Kinder Morgan pipeline for its potential negative impact on traditional fishing and culture.<sup>48</sup>

To Alberta’s east, TransCanada’s proposed Energy East pipeline has met with similar concern and protest. A coalition of First Nation leaders in Manitoba, Ontario and Quebec are establishing a political alliance to stop the pipeline.<sup>49</sup> These efforts are bolstered by criteria established by governments in BC, Ontario and Quebec for any approval of pipelines through their

provinces, including addressing First Nations rights and title, economic and fiscal benefits, and greenhouse gas emissions.

Beyond bitumen, other fossil fuel infrastructure projects have met with delays. First Nations opposition is particularly notable, with increased confidence arising from recent court decisions establishing rights and title over traditional territories. These are constitutional matters, slow to resolve in the courts. In May 2015, the Lax Kw'alaams First Nation rejected \$1 billion in cash payments over 40 years from Malaysia's Petronas due to the impact its proposed Pacific NorthWest LNG terminal would have on traditional salmon habitat.<sup>50</sup> On the other side of the country, resistance from the Elsipogtog First Nation in New Brunswick to fracking operations in their traditional territory captured national media attention in 2013.<sup>51</sup>

Other opposition is coming from unusual corners. Proposals to expand the export of thermal coal (coming from the United States) have so far met with opposition from a wide range of health professionals and organizations. Health considerations may also matter for domestic combustion of coal: the Obama administration made regulatory changes to coal-fired power generation largely on health grounds. This highlights the weakness of any holdings related to coal.

## 6. Fiduciary Duty in a Warming World

IN THE PREVIOUS sections we reviewed a wide range of risks associated with holding fossil fuel assets that we believe have not been adequately addressed by pension funds. These risks have become more pronounced in recent years and, for this reason, merit a considered response. The presence of divestment campaigns has also been a game changer by inserting strong moral arguments about the need to rapidly shift away from fossil fuels. Says analyst David Roberts:

[T]he climate movement’s message, despite back-to-the-land stereotypes still floating around, is not that humanity ought to return to a pastoral, pre-modern, low-energy lifestyle, or that the global poor ought to remain poor. It’s that a better world is possible — clean, high-tech, prosperous, and just — and that fossil fuel companies are using their enormous legacy wealth and power to prevent the transition to that better world. Doing so is immoral, as is supporting the enterprise with investment dollars. It is that narrative behind which activists are seeking to brand fossil fuel companies as social pariahs.<sup>52</sup>

If a critical mass of the population comes to agree that getting off fossil fuels is a moral imperative, this conviction raises the bar for what government can and will do to regulate and cap emissions. Further, it changes the parameters of acceptable behaviour in the financial marketplace. To the ex-

tent the divestment movement is successful, it reinforces all of the risk factors above, making stranded asset risk more likely, as fossil fuels increasingly become off limits to wide swaths of investors. At some point, holding fossil fuel stock would pose reputational risks.

Pension fund trustees have a fiduciary duty to “act prudently and not invest in a specific asset or adopt particular investment styles or preferences if this involves foregoing return opportunities on a systematic basis.”<sup>53</sup> While this is typically understood as maximizing returns, the key aspect of fiduciary duty is to ensure that those charged with managing funds on behalf of others do impartially and responsibly, rather than serving their own interests.

Understanding and addressing material risks to funds under management is thus inherent to fiduciary duty, including risks due to inflation, currency movements, regulatory changes, political turmoil, and general economic conditions. However, there has been a general failure to account for the type of fossil fuel investment risks we note in the previous sections.

Arguments about fiduciary responsibility have often been used to justify continued fossil fuel investment; for example, that any screening for environmental purposes would be detrimental to financial performance. Pension funds have tended toward short-term thinking, an excessive focus on quarterly or annual results, and risk-averse herd behaviour—following what others are doing, regardless of obvious risks.

A warming world implies changes in the approach to fiduciary duty. Because of the long-term planning horizons of pension funds, intergenerational arguments consistent with those raised by climate change should be viewed as non-trivial. Funds must equally represent the interests of young workers for their eventual retirements.<sup>54</sup> Presently, the models assume, implicitly or explicitly, an uninterrupted expansion of Canada’s oil industry. Maintaining the rapid rate of expansion in Canada’s oil patch that we witnessed over the last decade is contingent on expecting that our global economy can operate in a mostly uninterrupted way, with little or no enforcement of climate obligations, and enough global economic expansion to deliver high energy prices.

A recent analysis of the fiduciary duties of pension funds concludes: “climate change denial is not an option for pension fiduciaries.... At the security selection or investment decision-making level, all factors relevant to risk and return must be considered; if climate change is relevant to an investment and not too remote, it must be considered.”<sup>55</sup> In other words, pension fund trustees are obliged to make decisions based on facts. The scien-

tific consensus on climate science and the urgent need for action to rapidly reduce emissions are consistent with fossil fuel divestment.

Industry insiders may argue that divestment is a poor strategy for a few reasons: funds would lose any influence over the companies they have invested in, those assets would just be held by someone else, and there is a shortage of renewable energy company stock to replace divested fossil fuel stocks.

To the first argument, we can respond that some major funds are already engaging companies, though clearly more could be done to deepen these efforts and add more voices given the disinclination in the industry to move away from extracting fossil fuels. If engagement efforts to persuade corporate leadership to shift their business model have fallen on deaf ears, fund managers can do little but demand that companies provide maximum returns from existing extraction.

Regarding the second argument against divestment, there is some truth in the statement that divested fossil fuel holdings will be picked up by someone else. But if there are massive losses to come from energy transition, isn't it better to let others hold the bag? If some members of the world's super-rich were less wealthy due to spectacular losses arising from meaningful climate policies, so be it.

Pension fund divestment from fossil fuels would provide a powerful signal that large, mainstream players now view this industry like they do tobacco. They would add to the growing movement pushing for change, while delinking their financial well-being from that of fossil fuel producers.

The final argument against divestment is that there is a shortage of renewable energy company stock to replace divested fossil fuel stocks. While this may be true due to the massive size of the fossil fuel sector, renewable energy stock is not the only reinvestment option. Funds can invest in a range of equities, bonds, and real estate that do not necessarily need to have a "green economy" mission (the tech sector, for example). Pension funds already invest widely across the economy and directly in infrastructure projects around the world. Renewable energy projects can readily be structured to fit the expectations pension funds explain in their annual reports for holding such assets. Moreover, pension funds could do more to invest in a low-carbon future through clean and sustainable infrastructure, showing the asset management industry there is considerable demand for investments that are consistent with a sustainable energy future.

At a minimum, pension funds should articulate a "carbon tilt" in their portfolios — dropping the high-carbon performers in each sector. Divestment

campaigns have more successfully targeted companies producing coal, the dirtiest fossil fuel. Already, due to a mix of economic conditions and green shifts in decision-making in the U.S. and China, coal stocks have plummeted in recent years. Dirtier and higher-cost forms of oil, such as Alberta oil sands production, have also been successfully targeted by divestment campaigns.



## 7. What Are the Alternatives?

PENSION FUNDS PLAY a major role in the financial system and there is room to up their climate game. While we see divestment of fossil fuels as consistent with fiduciary duty, funds can and should also play a transformative role in building and scaling up the green infrastructure needed for a zero-carbon world that is only a few decades away. Infrastructure requires upfront capital investment with a return paid out over decades, which aligns well with the needs and long-term horizons of pension funds.

There are a multitude of vehicles for such investment. A great deal of infrastructure investment will be required from the public sector. “Green bonds,” a means of packaging certain types of infrastructure investments, raised \$1.3 billion in Canada in 2014 — up from nothing the previous year.<sup>56</sup> A fall 2014 green bond issue from the government of Ontario in support of transit infrastructure was almost five times oversubscribed (bids of \$2.5 billion were received for a \$500-million issue).<sup>57</sup> Other green bond issues have been similarly oversubscribed, which suggests ample support from the financial markets.

While borrowing through financial markets for transportation infrastructure is not new — Metro Vancouver’s Translink has borrowed over the years without referring to its bonds as “green” — green bonds issued from state governments and international agencies show a growing recognition that substantial investments will be required to build a zero-carbon economy.<sup>58</sup>

Vancouver's Neighbourhood Energy Utility, a low-carbon district energy system in the new Southeast False Creek development, offers another example of green infrastructure. As an innovative project, the NEU attracted a major grant from the federal government, accounting for about one-third of capital costs, with much of the remainder internally financed by the city in exchange for an annual return on capital.<sup>59</sup> Several years after its launch in 2010, the NEU has proven itself to be an effective utility business model, with revenues from a growing customer base as the development expands. Analysis shows that even in the absence of the federal grant, the project's economics would have been favourable. These systems can often struggle due to upfront capital costs, which makes them especially suitable for investors such as pension funds.

Private sector investments in renewables could look like the U.S. company Solar City. On the customer side, Solar City installs and maintains solar panels, while charging and guaranteeing a price lower than its clients' previous electricity bills. To raise capital, the company has issued Solar Bonds, which Americans can now put into their retirement accounts, and accepted a \$300-million investment from Google.<sup>60</sup> While it is disputable this "democratizes" energy, as the company claims, the model is gaining traction now that solar costs have come down so much.

This kind of approach to renewables would be of most interest to Canadian provinces with electricity generated from fossil fuels, and could be developed through Crown corporations as a bond issue. Manitoba Hydro has funded energy efficiency investments in a similar manner, passing lower prices on to customers, while the upfront investment is economically justified by energy savings to the utility.

Other innovative approaches are also making headway. YieldCos, publicly-traded corporations that purchase and operate assets, are providing stable returns to investors. This hybrid of bonds and equities has a precedent in Canada in the form of real estate investment trusts (REITs).<sup>61</sup> Pension funds could show leadership by using this model as part of their investment strategy.

The bottom line for pension funds is that there are a wide range of options available as they divest from fossil fuels, and these will grow substantially in the face of more stringent climate policies. But pension funds could also play a role by strategically allocating capital in support of green infrastructure, achieving returns comparable to those that once came from fossil fuel investments.

# Conclusion

SUCCESSFUL DIVESTMENT CAMPAIGNS by municipal governments, churches, and universities are proving fossil fuels are the new tobacco, taking the movement to financial markets, and questioning the legitimacy of a business model that is inconsistent with a habitable planet. An overarching question now, as we approach another important international climate summit, is whether humanity can find the political will to meaningfully address the carbon pollution that is causing climate change.

While progress toward an international treaty to constrain carbon emissions has been slow, the Fall 2014 accord between the U.S. and China to reduce emissions is a positive sign. Add in the European Union, which has also taken important steps to address climate change, these three countries represent more than half of global emissions, infusing hope into climate negotiations for the first time in many years.

Grassroots action is also intensifying. In September 2014, 400,000 people marched in New York City, and even more in satellite actions around the world, in the largest march for climate action in history. Resistance to new fossil fuel infrastructure, such as the Keystone XL, Northern Gateway and Energy East pipelines, is making life difficult for fossil fuel corporations. Religious leaders, notably the Pope, have provided strong moral support to the cause of climate action.

Addressing climate change requires a shift from investing in fossil fuel infrastructure to green infrastructure. Pension funds can be part of that solution while meeting their fiduciary responsibility to beneficiaries. We hope

this report sparks a new conversation among pension fund trustees and concerned plan members, in particular in the following areas:

**Disclosure:** Members and trustees should press for detailed disclosure of pension fund portfolios so there is daylight on holdings.

**Carbon stress testing:** Faced with the risks outlined here, fund managers and trustees should be required to justify continued fossil fuel investments, clarify the risks associated with fossil fuel holdings, and develop criteria to evaluate best and worst performers.

**Engagement:** Pension trustees should be asking pointed questions of fossil fuel companies about their capital investment plans in light of climate science and future constraints on carbon.

**Divestment and re-investment:** Pension funds should develop a process for divestment and removal of high-risk companies from portfolios, minimally aimed at coal and tar sands stocks, but ideally across all sectors. This should also include a process for re-investment – shifting funds to other areas of the economy and to strategic green infrastructure investments.

# Appendix

## Estimated Carbon Exposure of Public Sector Pension Funds

INDIVIDUALS ARE OFTEN advised to distribute their financial investments across a range of asset types (typically stocks, bonds, and cash). The same is true for pension funds, although they have access to a much wider range of choices due to their size. This can include mortgages, privately held firms, infrastructure, renewable resources (such as forestry), fixed income, real estate, and the equity shares traded on public exchanges. These asset classes provide returns in different ways and hold various risk characteristics. Fund managers seek to optimize these characteristics using techniques of portfolio construction.

Across the 20 largest public sector funds, the average portfolio allocation was 46.8% in equities (13.9% to Canadian companies), 21.4% to bonds, 3.7% to absolute return strategies (such as arbitrage, leverage, derivatives, options, and short selling), 7.7% to infrastructure, 6.3% to private equity and other private placements, 2.7% to mortgages, and 2.2% in resources, with about 9.2% in a range of other investments. Oil, gas, and coal investments that carry explicit unburnable carbon risks can directly or indirectly enter into pension fund portfolios through each of these asset classes.

Although our analysis was limited due to a lack of data disclosure from pension funds, we evaluated the potential carbon exposure by assessing the fossil fuel holdings of each fund based on their exposure to exchanges

based in Canada, the U.S., and around the world. This estimation is contrasted against the financial impact on energy companies of the oil price rout that started in 2014. Pension funds can also take on stranded asset risks through their investments in bond markets (primarily corporate bonds issued by major energy companies, but also government debt), commodity markets, and fossil fuel infrastructure (such as pipelines, equipment, and export facilities).

**TABLE 1** Estimated Carbon Exposure of Public Sector Pension Funds

Rank	Pension Fund Name	Abbreviation	Number of total members	Assets under management, 2013 (\$billion)	Estimated Fossil Fuel Content—Equities	Estimated Fossil Fuel Content—Other Asset Classes†	Estimated Losses from Oil Price Shock (\$million)
1	Ontario Teachers' Pension Plan	OTPP	307,000	\$140.8	5.6%	12%	\$1,768
2	Ontario Municipal Employees Retirement System	OMERS	429,000	\$66.3	1.3%	14%	\$192
3	Public Service Pension Plan	PWGSC	563,714	\$56.9	5.4%	5%	\$695
4	Healthcare of Ontario Pension Plan	HOOPP	286,212	\$54.5	0.4%	11%	\$53
5	Quebec Government & Public Employees Retirement Plan	RREGOP	579,466	\$50.6	4.6%	7%	\$523
6	BC Municipal Pension Fund	MPP	290,967	\$36.0	6.2%	4%	\$506
7	Alberta—Local Authorities Pension Plan	LAPP	320,000	\$26.5	5.5%	5%	\$326
8	BC Public Service Pension Plan	PSPP	113,191	\$20.9	6.6%	4%	\$310
9	Ontario Pension Board	OPB	41,925	\$20.9	3.3%	4%	\$154
10	BC Teachers Pension Fund	TPP	90,000	\$20.7	6.6%	4%	\$306
11	Canadian Forces Pension Plan	CFPS	64,000	\$18.4	6.6%	5%	\$237
12	OPSEU Pension Trust	OPTrust	84,000	\$16.0	5.7%	7%	\$188
13	Régime de Retraite du Personnel d'Encadrement	RRPE	29,118	\$8.7	5.2%	4%	\$114
14	Alberta Teachers' Retirement Fund	ATRF	74,900	\$8.6	5.8%	5%	\$140
15	Alberta—Public Service Pension Plan	AB-PSP	79,930	\$8.6	7.2%	4%	\$121
16	Province of Newfoundland & Labrador	NLPSPA	42,000†	\$8.3	6.3%	3%	\$184
17	RCMP Pension Plan	RCMPPP	35,000†	\$6.7	9.8%	5%	\$87
18	The Public Employees Pension Plan (Saskatchewan)	PEPP	54,000	\$6.5	5.7%	2%	\$120
19	New Brunswick—Public Service Shared Risk Plan	NBPS	24,000†	\$5.6	8.2%	3%	\$100
20	Healthcare Employees Pension Plan—Manitoba	HEPP	72,050	\$5.5	7.9%	5%	\$113

**Note** Estimated losses from oil price shock are for equities only, based on market valuations between June 1, 2014 and December 31, 2014

**Sources** 2014 Annual Reports of these pension funds

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