



MERCER

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Carbon Counts: Assessing the Carbon Exposure of Canadian Institutional Investment Portfolios

A report commissioned by WWF–Canada

The background of the lower half of the cover is a grayscale photograph of a large industrial smokestack emitting a thick plume of white smoke that rises into the sky. The smoke is dense and billowing, partially obscuring the sky.

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Executive summary

The credit crisis provided an alarming example of what can happen when the investment community fails to identify and address systemic risks building within the global financial system. Following growing scientific consensus and public concern, investors are increasingly narrowing their sights on climate change as another material risk that will soon face businesses and the capital markets.

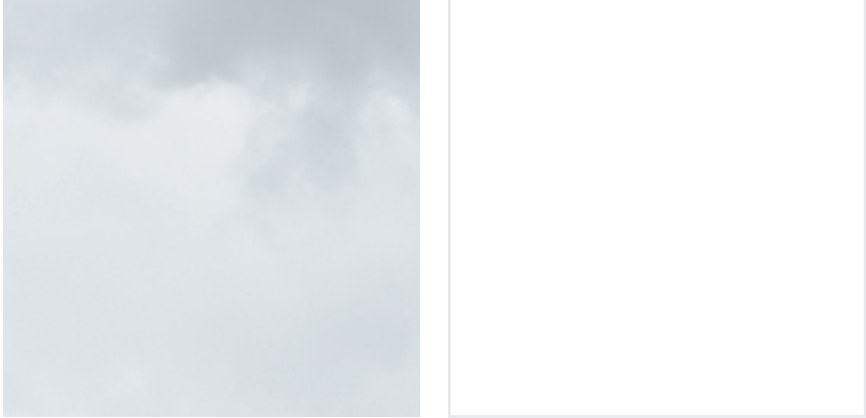
Climate change and related carbon risk are becoming important issues for institutional investors – both in terms of potential risk and opportunity.

As world leaders debate global emission reduction targets and

consider additional carbon trading systems, markets continue to fail to systematically integrate climate change considerations into company valuations.

WWF-Canada commissioned this study in order to identify the carbon exposure of Canadian institutional pooled investment products and raise awareness regarding its findings. The study was undertaken by Mercer, utilizing carbon footprint data provided by environmental data provider Trucost Plc (Trucost).

Carbon exposure is the focus of this report, but it is only one area of risk in the face of climate change.



Overview

Assessing the carbon exposure of an investment portfolio is one way that investors can bring climate change analysis into the investment process. It allows for consideration, quantification and monitoring of the level of carbon in a public equity portfolio (or those of other asset classes). As such, this report undertakes an analysis to find what stock selection and sector allocation contribute to the level of carbon in a benchmarked portfolio. For WWF-Canada's study of this issue, Mercer and Trucost have provided analysis in the following areas of study:

1. Analysis of the carbon exposure of Canadian and global institutional pooled investment funds (Mercer)
2. Four case studies of the carbon exposure of selected Canadian institutional investors (Mercer)
3. A discussion of investment risks within oil sands operations (Trucost)
4. Opportunities for asset owners and investment managers to take action (Mercer)

Overview of the carbon exposure of Canadian and international institutional pooled investment funds

The analysis of institutional investment funds is based on funds contained within Mercer's Global Investment Manager Database (GIMD™) for which carbon exposure information was available as at Dec. 31, 2009:

- For Canadian pooled equity investment funds, carbon exposure data were available for 181 strategies (with an average of 70% coverage for securities held within those strategies). These Canadian pooled equity funds are invested both in Canada (48%, corresponding to 87 strategies out of 181) and globally.
- The global equity analysis is based on 1,134 non-segregated equity strategies for which carbon footprint data were available. Twenty different benchmarks were included, depending on the geographic region of the non-segregated funds.

Overall findings

- The S&P/TSX is the third largest market in terms of carbon footprint, measured in carbon dioxide equivalent (CO₂e) per USD1 million sales. Canada is only preceded by India and Emerging Markets, and is followed by Australia. As expected, these findings are consistent with resource-based economies.
- The average carbon exposure of the 181 Canadian pooled funds studied in this report is less than that of the benchmark.
- This result is largely due to the sector allocation decision of managers to underweight the heavily emitting utilities, energy and materials sectors. Except for the materials sector, security selection within these sectors also helped reduce the footprint of Canadian pooled funds.
- Canadian pooled-fund sector rotation was higher over the last year than in the previous three. This resulted in very different carbon footprint findings from quarter to quarter.
- In terms of style, for the Canadian pooled-fund universe and the world non-segregated equity funds, the growth portfolios tended to have lower carbon footprints than did their value counterparts.
- In contrast with the Canadian market, large cap international non-segregated equity funds tend to have a lower carbon footprint than do their small/mid cap counterparts.
- Non-segregated global value portfolios have a much wider range of carbon footprints than do growth or core portfolios, making fund selection more important.
- On balance, world non-segregated growth funds offer the lowest carbon footprints, even after adjusting for the respective benchmarks. Also, their range of tilts is much narrower than that of value funds.

Case studies of four Canadian institutional investors

To better consider carbon footprint analysis in the context of unique investment organizations, four case studies were undertaken. These included two Canadian endowment funds, Toronto Atmospheric Fund (TAF) and Community Foundation of Ottawa (CFO); one Canadian public pension fund; and one workers' union fund in Canada, Batirente. For each, we assessed the carbon footprint of one of their external equity managers (all of which were benchmarked against the S&P/TSX Capped Composite Index). This provided different points of views on carbon footprint assessment for different investment portfolios and allowed for the opportunity to discuss the outcomes and the potential for follow-through by each organization.

Highlights: Findings were different for each case study participant

- TAF's carbon footprint was lower than the benchmark carbon footprint for the portfolio analyzed. The primary difference was that the portfolio manager chose to invest in less carbon-intensive sectors compared to the benchmark over the time period. The manager's security selection also had a positive impact in terms of carbon reduction.
- CFO's carbon footprint was lower than the benchmark's for the portfolio analyzed, again with sector allocation acting as the main contributor in reducing carbon footprint.
- The public pension plan (participating on an anonymous basis) also had a lower carbon footprint than the benchmark's but was equal to it when the sector allocation effect was removed.
- Bâtirente's carbon footprint was higher than the benchmark carbon footprint when the sector allocation effect was removed, suggesting that stock selection increased the portfolio's carbon footprint.
- Three out of four participants plan to follow up on discussions with their investment managers on the way they are integrating carbon risk analysis and opportunities into their portfolio.

A discussion of investment risks within oil sands operations (provided by Trucost)

The impact of the oil sands in Alberta, as an important component of Canadian pooled funds, is provided as a part of this analysis.

Oil sands highlights

- The pooled funds invested USD3.7 billion in 20 companies analyzed that own or operate oil sands projects. The largest investments were in Suncor Energy and Canadian Natural Resources Ltd.
- Thirteen of the companies had stakes in 11 oil sands projects that were in production in 2008 and emitted over 33 million tonnes of greenhouse gases (GHGs) in 2008. The remaining companies owned projects that were still in development.
- The 13 companies held in the pooled funds produced over 1 million barrels of oil per day from oil sands in 2008.
- Carbon intensity increased between 2006 and 2008 at six projects analyzed. Rising carbon intensity could indicate growing exposure to carbon costs.
- The carbon intensity of oil sands projects varies widely. Factors that include different production processes contribute to variations in carbon intensity.
- The combined proved oil sands reserves for potential future exploitation by 11 companies equates to almost one-third of their total proved oil reserves.
- The funds "own" 115 million barrels of oil sands proved reserves. Carbon costs for projected emissions from owned reserves could total from USD297 million to USD464 million at a carbon price of USD30.28 per tonne of CO₂e. Exposure to future carbon costs is greatest through holdings in Canadian Natural Resources.



Opportunities for asset owners and investment managers to take action

Managing the risks and opportunities associated with climate change and carbon emissions is an emerging practice. New tools are being developed, awareness is growing and more research into the impact of carbon management and overall emissions on company performance is emerging.

This leads us to a point in time when asset owners and the investment managers they hire need to become increasingly sophisticated in the way they consider, approach, measure and manage climate-related risks.

Asset owners can:

- Undertake a policy review and carbon footprint analysis, and then can consider introducing related criteria into the selection and evaluation of fund managers
- Monitor portfolios on GHG emissions and related exposure to carbon costs under existing and planned regulatory frameworks
- Develop processes to proactively manage emissions-related risks and opportunities in portfolios to better protect their beneficiaries' long-term savings

Further, asset owners can encourage investment managers to report on how they are addressing GHG-related risks by posing questions such as the following:

A critical tool for trustees: Knowing which questions to ask investment managers

- What expertise do you have regarding climate change?
- Do you engage with companies on this issue?
- Do you factor climate change-related risks and opportunities into investment decisions?
- Can you assess the potential risk and opportunities of climate change on our portfolio holdings?

Investment managers can:

- Increase the extent to which they report to clients on their exposure to carbon emissions within the portfolio
- Integrate climate change criteria, such as carbon performance, into financial analysis, stock-selection decisions and active-ownership practices
- Use existing carbon data and support robust mandatory emissions reporting requirements for companies to disclose GHG emissions and related costs to investors
- Invest in solutions such as renewable energy and energy-efficiency technologies
- Engage with carbon-intensive investee companies to encourage them to report emissions fully, disclose carbon costs, reduce emissions and develop effective strategies to manage climate risks and opportunities

Climate change and related carbon risk are becoming issues of importance for institutional investors – both in terms of potential risk and opportunity. Moving toward quantifiable and comparable environmental data is the first step toward assessing climate change-related investment risks.

2

Introduction

This report provides, for the first time in Canada, a quantitative assessment of the environmental impact of Canadian institutional investors' portfolios. This assessment, which was commissioned by WWF-Canada and provided by Mercer and Trucost, analyzes the GHG emissions – and associated risks – generated by companies held in these institutional portfolios.

The focus on carbon and carbon-related emissions is both relevant and meaningful. It is relevant because governments and societies around the world are struggling to understand and adapt to climate change, driven in large part by economic decision making. Whether or not individual investors believe climate change is a reality, most investors recognize that we are likely to see profound regulatory and social changes driven by climate change concerns.

The focus on emissions is meaningful because what we measure, we can manage. Moving toward quantifiable and comparable environmental data is the first step toward assessing climate change-related investment risks. These risks are not limited to the financial industry's typical focus on quarterly earnings but encompass regulatory, litigation and reputational risks as well.

The difference between the portfolio and benchmark carbon footprint is proxy for potential risk. The greater the carbon in the portfolio as compared to the benchmark, the higher the exposure to emission-related risks can be assumed. Moving toward quantifiable and comparable environmental data is the first step toward assessing climate change-related investment risks associated with changes to regulation, assessment of physical impacts of company operations, litigation, competition and reputation.

In analyzing the carbon intensity of portfolios, this report raises and seeks to respond to the following questions:

- How exposed are Canadian pension funds and other institutional investors if a quantifiable value is introduced for carbon emissions?¹
- Are investment managers incorporating carbon risks and opportunities into their investments?
- Which economic sectors or individual companies make the largest contribution to carbon emissions in a portfolio?
- What can investors do to help ensure that risks and opportunities are being managed in their portfolios?

¹ "Carbon", "carbon emissions", and "carbon footprint" are terms used throughout this report; however, it should be understood that these terms include other GHG emissions identified and quantified in line with international standards. For the purposes of this analysis, the carbon footprint for a company, an investment portfolio or a benchmark is equal to the tonnes of CO₂e divided by sales and is measured in units of tonnes of CO₂e per USD 1 million sales.

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Carbon exposure of equity funds

Carbon exposure of equity funds

This chapter explores the carbon exposure of Canadian equity pooled funds and non-segregated global equity funds. The analysis assesses the environmental impact of Canadian institutional investor portfolios resulting from the choices that managers make regarding asset allocation and security selection. The managers reviewed in this study have different market cap biases (large cap, mid/small cap, neutral) or style biases (value, growth or core). Our analysis assesses the impact of these choices in relation to portfolio carbon footprint/environmental impact.

The results discussed herein are based on only active strategies, because passive strategies tracking the benchmark were deemed to have a limited value added in terms of understanding the impact of manager asset and security selection with respect to the carbon footprint of the portfolio.

Carbon exposure of Canadian equity pooled funds

The Canadian analysis is based on the Canadian institutional pooled funds contained within Mercer's GIMD for which carbon footprint data were available.² As at Dec. 31, 2009, out of 571 active Canadian pooled-fund strategies in the GIMD universe, there were 181 active strategies with carbon footprint data valued at USD46.5 billion with investments across 20,853 companies. These Canadian equity pooled funds are invested both in Canada (48%, corresponding to 87 strategies out of 181) and globally.

Carbon footprint data were available for an average of 78% of the securities held within the 181 portfolio strategies reviewed. However, the coverage range depended on the asset class. For instance, carbon footprint data are available for 96% of the equities within the international strategies available for Canadian investors (69 strategies). There is 70% coverage for Canadian equities benchmarked against the S&P/TSX Index (77 strategies) but weaker coverage for small cap Canadian equities (10 strategies). The difference between asset classes is mainly explained by the limited coverage of small cap companies in the Canadian universe maintained by Trucost.

The analysis of the 181 Canadian institutional pooled funds was conducted in terms of market capitalization (large, mid/small or neutral) and style (value, growth or core) based on how the manager identifies the strategy in Mercer's GIMD. In addition, a more detailed sector analysis and carbon footprint attribution was conducted as at Dec. 31, 2009.

² Mercer's proprietary GIMD is a database that stores all types of manager information: firm-wide demographic details, investment product details, performance and Mercer research such as our meeting notes, news items and manager ratings. There are more than 3,300 investment managers in our database that manage more than 19,000 different investment strategies. All the managers participating in this search were asked to access the database and ensure that all their details were correct and up to date.

Terminology and style definitions

Market capitalization is often used as a measure of a company's size. It is equal to the market value of the company's share price multiplied by the number of shares outstanding (common stock). **Small capitalization** strategies are portfolios that contain stocks of companies with a capitalization smaller than the average of the market. Managers identify their strategies as either **large/mid/small cap or market neutral**.

An investment style employed by investment managers who invest primarily in companies that have superior growth prospects is identified as a **growth style**. An investment style employed by investment managers who invest primarily in companies that appear to be undervalued relative to the market is identified as a **value style**. Finally, a strategy with investments in a large number of securities in each sector of the economy in order to obtain a portfolio with characteristics similar to that of the index (that is, no value or growth bias) is identified as a **core style**.

The results of the study are displayed using quartile charts for the carbon footprint, carbon footprint tilt and carbon footprint sector-adjusted tilt, as explained below:

- To calculate a company's carbon footprint, Trucost analyzes a company's direct GHG emissions (Scope 1 of the GHG Protocol) and its first-tier (direct) supplier emissions (Scope 2 and Scope 3 of the GHG Protocol). A company's carbon inventory will thus include its direct emissions from fossil fuel combustion and relevant chemical processes, as well as supply chain emissions from purchased electricity, business travel and logistics. All GHG emissions are adjusted for their global warming potential, or their ability to cause climate change, and summed to a CO₂e value. So that companies can be compared regardless of size, industry or geography, Trucost normalizes a company's carbon emissions to its annual sales revenue. A company's carbon footprint is thus its tonnes of direct and first-tier supply chain CO₂e emissions per USD million sales revenue (tonnes of CO₂e/USD million sales).
- Carbon footprint is understood as the tonnes of CO₂e divided by sales and is measured in units of tonnes of CO₂e per USD1 million sales. This factor is intended to provide insight into exposure to GHG emission-related risks. The rationale is that companies with carbon footprints in excess of their peers may have higher CO₂ emissions-related risks (for example, regulatory, physical, litigation, competitive and reputational risks).
- Carbon footprint tilt is designed to answer the question "How significantly different is the portfolio's

carbon footprint from the benchmark's carbon footprint?" The tilt is a standardized measure that uses a normalization process. Normalization is adjusted for sample size so that the tilts are standard deviations from the mean of the selected benchmark. The tilts are indicators of how significantly different the portfolio is from the benchmark.

- Carbon footprint sector-adjusted tilt repeats the tilt analysis outlined above but neutralizes the impact of sector weighting. It presents the difference between the carbon footprint of the portfolio and that of the benchmark when the impact of the sector allocation is stripped out from the analysis. Therefore, the sector-adjusted tilt is driven by the carbon footprint of individual companies within each sector, rather than by sector weights.

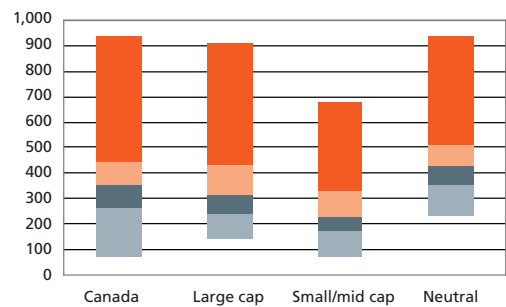
- Orange: top 25%
- Light orange: 50%–75%
- Grey: 25%–50%
- Light grey: bottom 25%

The length (spread) of the quartile box represents the variation within the universe of pooled funds considered in the analysis for each given quartile.

Three types of graphs will be used for the analysis: carbon footprint (measured in tonnes of CO₂e divided by sales), carbon footprint tilt (standardized measure) and carbon footprint sector-adjusted tilt. These concepts were explained in detail above.

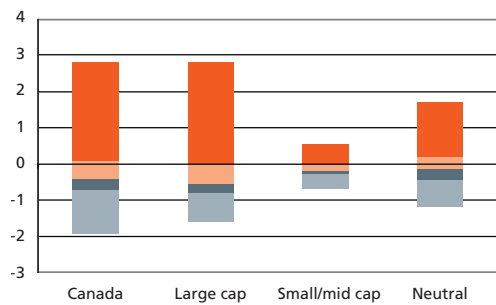
Market capitalization of Canadian equity pooled funds

Carbon footprint by market cap



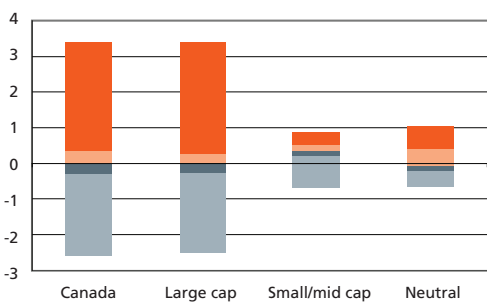
- Small/mid cap portfolios offered to Canadian investors tend to have lower carbon footprints than do Canadian large cap or neutral portfolios. The median carbon footprint of the small/mid cap portfolios is lower than that of large cap portfolios. The range for the small/mid cap portfolios is also smaller than that of large caps.
- Interestingly, close to neutral market cap portfolios have the highest carbon footprint, due to sector allocation (refer to sector-adjusted tilt graph).

Carbon footprint tilt by market cap



- Small/mid cap funds³ offered to Canadian investors tend not to deviate much from their benchmarks in terms of carbon footprint.
- On balance, large cap funds offer a lower tilt. However, the tilt of these funds tends to be widely dispersed, suggesting that specific fund selection is much more critical within the Canadian large cap universe of pooled funds.
- Interestingly, the median fund in each market cap category is below the benchmark, although not by a statistically significant amount.

Carbon footprint sector-adjusted tilt by market cap

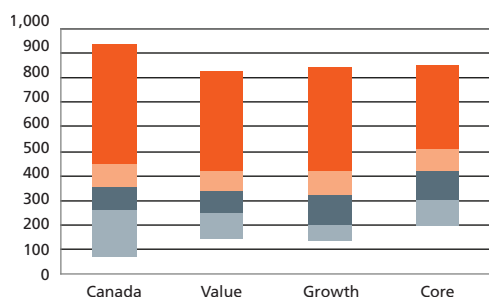


- Small/mid cap portfolios offered to the Canadian investor tend to have a tight range in terms of carbon footprints, even after adjusting for sector deviations. However, the sector-adjusted tilt for smaller capitalized portfolios suggests that, on balance, these managers tend to select stocks with higher carbon footprints.
- The median large cap fund has a sector-adjusted tilt in line with the benchmark, but again, there is a wide range of carbon footprints within the Canadian large cap universe of pooled funds, making manager selection critical.

³ These funds correspond to those benchmarked against the all cap index but with a small/mid cap bias as identified by the manager in GIMD.

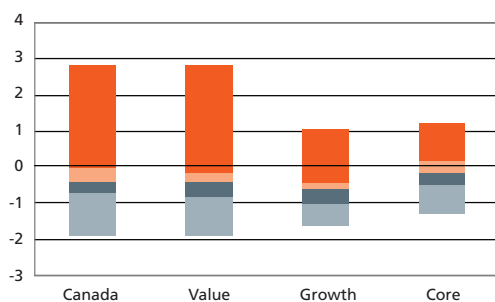
Style analysis of Canadian equity pooled funds

Carbon footprint by style



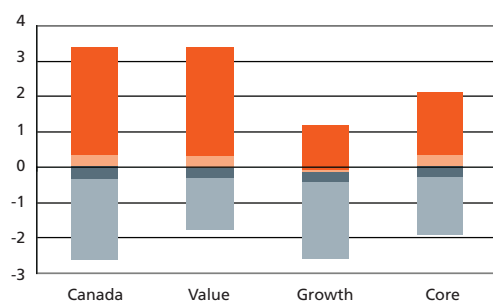
- Growth portfolios offered to Canadian investors tend to have slightly lower carbon footprints than those of value portfolios. However, Canadian growth portfolios have a slightly wider range of carbon footprints, highlighting the importance of fund selection.
- Importantly, both Canadian value and growth portfolios tend to have a slightly lower median carbon footprint than do core portfolios or the overall Canadian pooled-funds market.

Carbon footprint tilt by style



- Canadian growth portfolios tend to offer the lowest carbon footprints, even after adjusting for the respective benchmarks.
- Interestingly, Canadian growth funds no longer have the widest dispersion of carbon footprints once the portfolios are adjusted for the benchmarks. In fact, the range of tilts for growth funds is much narrower than that of value portfolios. Similarly, funds with a core strategy tend not to deviate much from their benchmarks.
- Consistent with our findings with strategies of differing capitalization strategies, the median fund footprint in each of the investment style categories is below the benchmark, although not by a statistically significant amount.

Carbon footprint sector-adjusted tilt by style



- The carbon footprint of the median fund in each of the investment style categories is very close to that of the benchmark after adjusting for sector deviations.
- However, the bottom quartile is skewed much lower for Canadian growth funds compared with either value or core portfolios offered to Canadian investors. Thus, manager selection is critical.

Carbon footprint attribution analysis

The table below provides details in terms of the contribution of sector allocation, stock selection and the interaction per sector for the combined 181 Canadian institutional pooled funds and their respective benchmarks included in the analysis.

Sector	Weight		Carbon footprint (tCO ₂ e/USD million revenue)		Footprint attribution			
	Port.	Bench.	Port.	Bench.	Sector allocation	Stock selection	Interaction	Total
Financials	23.7%	24.8%	22.5	24.9	4.9	-0.6	0.0	4.3
Energy	17.0%	18.2%	639.3	642.2	-2.0	-0.5	0.0	-2.5
Utilities	2.1%	3.4%	3370.3	4805.1	-58.2	-49.1	19.3	-87.9
Information technology	8.6%	7.2%	78.6	64.9	-5.8	1.0	0.2	-4.7
Health Care	6.1%	5.4%	70.6	68.5	-2.9	0.1	0.0	-2.7
Consumer staples	7.1%	6.6%	212.9	219.6	-1.3	-0.4	0.0	-1.8
Consumer discretionary	8.8%	7.1%	114.6	104.3	-6.5	0.7	0.2	-5.6
Telecommunication services	4.6%	4.4%	35.0	37.3	-0.7	-0.1	0.0	-0.8
Industrials	10.0%	8.6%	296.1	307.9	-2.4	-1.0	-0.2	-3.6
Materials	12.0%	14.3%	960.6	920.7	-10.2	5.7	-0.9	-5.4
		Total	367.0	477.7	-85.1	-44.2	18.6	-110.7

The average sector weights and carbon footprints for the combined portfolios and the benchmark are provided as well as the total weighted average carbon footprints.

The sector allocation factor takes into account the carbon footprint impact of the typical Canadian fund manager's decision to overweight or underweight a particular sector within the portfolio. Similarly, the stock selection factor accounts for the carbon footprint implication resulting from individual security selection within each sector. Finally, the interaction factor is the residual impact resulting from both asset allocation decisions. Interaction does not represent an explicit decision of the investment manager, and with the exception of the utilities sector, the interaction factor is close to zero. The utilities sector is the largest polluting sector in both the portfolio holdings and the benchmark.

It is interesting to note that the total carbon footprint of the Canadian pooled funds is less than the benchmark, an observation highlighted in the charts in the prior pages. This result was largely due to the sector allocation decision of managers to underweight the heavily polluting utilities, energy and materials sectors. Except for the latter, security selection within these sectors also helped reduce the footprint of Canadian pooled funds. These findings may change over time, as the sector allocation is a tactical strategy changing over time.

Similarly, an above-benchmark allocation by fund managers in relatively lower polluting sectors (including telecommunication services, health care, information technology and consumer discretionary) also helped reduce the total carbon footprint. Stock selection offset some of these impacts.

However, on balance, fund managers held a below-benchmark allocation to financials. Given that this is a very low polluting sector, the choice to underweight financials and reallocate the funds elsewhere increased the overall carbon footprint of the average Canadian pooled portfolio and offset some of the impacts from other asset allocation decisions. However, stock selection within the financial sector helped reduce the overall carbon footprint and keep it below the aggregate benchmark.

Carbon exposure of non-segregated global equity funds

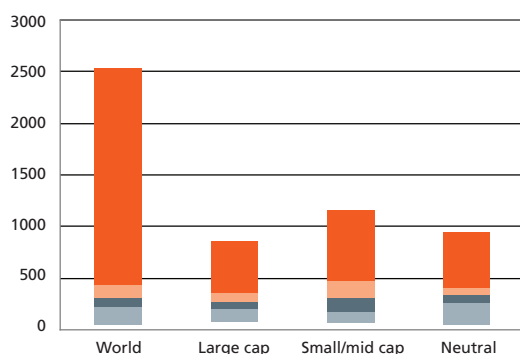
The analysis is based on non-segregated equity funds contained within GIMD for which carbon footprint data were available. A non-segregated strategy is defined as a grouping of assets from more than one client. The following types of non-segregated vehicles (across regions) are included in this analysis: Australian wholesale pooled superannuation trusts, Australian wholesale unit trusts, Canadian institutional pooled funds, Open Ended Investment Companies (OEICs), Pension Fund Pooling Vehicles (PFPVs), SICAF, SICAV, US ERISA and US Non-ERISA institutional pooled funds.

As at Dec. 31, 2009, out of the 6,148 active non-segregated global equity strategies in the GIMD universe, carbon footprint data were available for 1,134 strategies. The coverage per region was as follows: Asia (75 strategies), Japan (51 strategies), Australia (132 strategies), Emerging Markets (68 strategies), International (408 strategies), US (305 strategies) and Canada (95 strategies). The latter includes the 87 Canadian pooled-fund vehicles previously discussed and eight other non-segregated vehicles in the Canadian equity universe.

Twenty different benchmarks were included in the study, depending on the region of the non-segregated fund. For instance, in the US equity market, the Russell 1000®, Russell 2000®, Russell 2500® and Russell 3000® were included. In the international non-segregated portfolios, the MSCI EAFE, MSCI World, MSCI EAFE Small Cap and MSCI World Small Cap indices were incorporated.

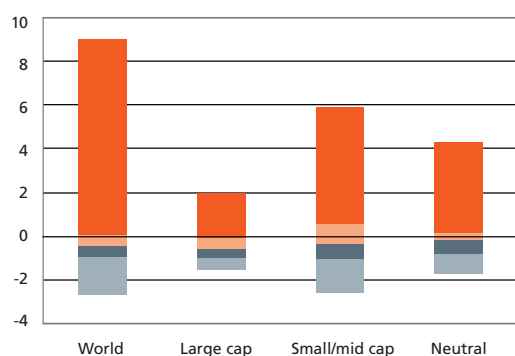
Market capitalization of non-segregated global equity funds

Carbon footprint by market cap



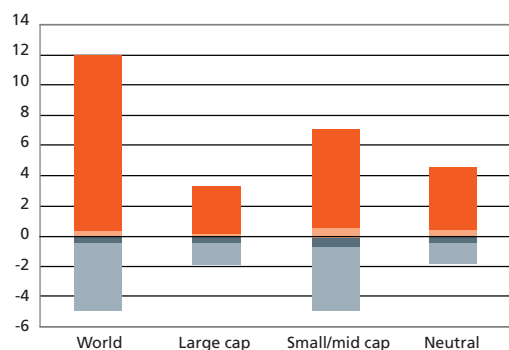
- In contrast to the Canadian market, large cap funds offered to global investors tend to have lower carbon footprints than do their small/mid cap counterparts. This regional difference is largely the result of a disproportionate weight to materials and energy companies in the Canadian large cap universe. Global large caps are heavily weighted to financials, pharmaceuticals and technology.
- The top quartile of the overall world non-segregated equity funds has a notably wide spread. This is the result of a handful of emerging Asian portfolios that have an exceptionally high carbon footprint but have failed to provide details in GIMD on their capitalization strategies.

Carbon footprint tilt by market cap



- Large cap funds offered to global investors tend not to deviate materially from their benchmarks with respect to their carbon footprints. Small/mid cap and market neutral strategies had a wider range, making fund selection much more critical.
- The median large cap fund offered to global investors has a lower carbon footprint than does the median small/mid cap portfolio. However, the tilt of the bottom quartile of the small/mid cap strategies is noticeably lower.
- As found in the Canadian analysis, the median fund in each market cap category for world non-segregated funds is below the benchmark, although not by a statistically significant amount.

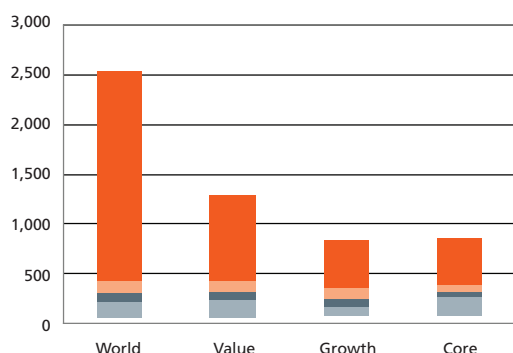
Carbon footprint sector-adjusted tilt by market cap



- The carbon footprint of the median fund in each of the capitalization categories is roughly equivalent to the benchmark after adjusting for sector deviations.
- Large cap portfolios offered to global investors tend to have a very narrow range in terms of their sector-adjusted carbon footprint tilts. In contrast, there remains a wide dispersion among small/mid cap funds, making manager selection critical.

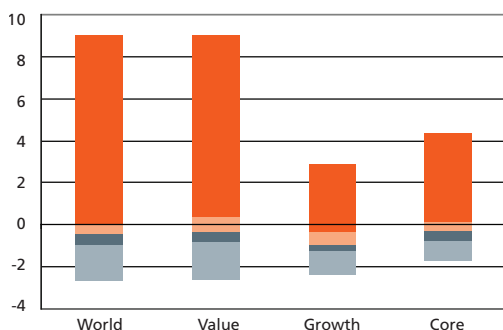
Style analysis of non-segregated global equity funds

Carbon footprint by style



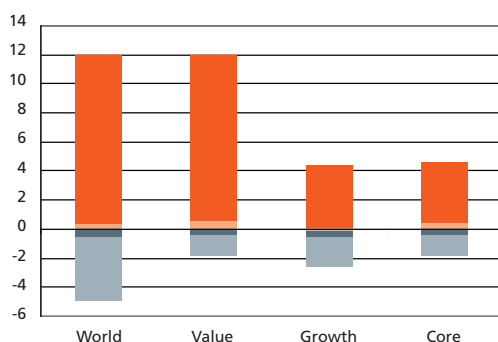
- Similar to the Canadian pooled-fund universe, the growth portfolios offered globally tend to have lower carbon footprints than do their value counterparts.
- Non-segregated global value portfolios have a much wider range of carbon footprints than growth or core strategy portfolios, making fund selection more important.
- Again, the dispersion of the top quartile carbon footprints of the overall world non-segregated equity funds is notably wide and extends much higher than do each of the style categories. This is due to a few emerging Asian portfolios with exceptionally high carbon footprints that failed to provide details in GIMD on their style bias (as highlighted previously).

Carbon footprint tilt by style

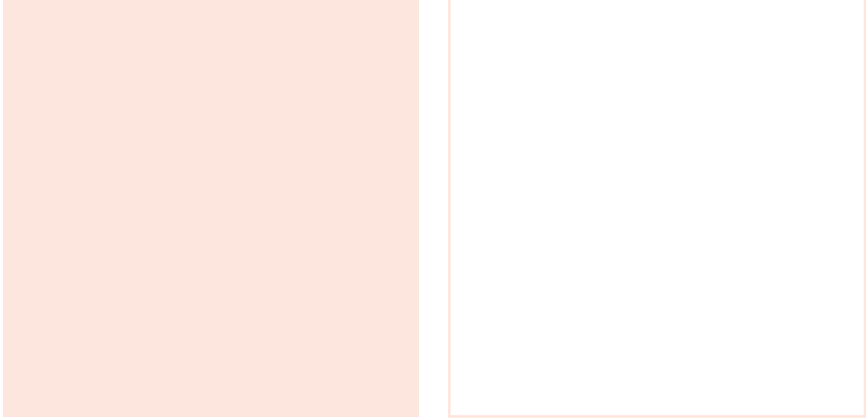


- On balance, world non-segregated growth funds offer the lowest carbon footprints, even after adjusting for the respective benchmarks.
- The range of tilts for global growth portfolios is much narrower than that of value funds. The latter has a particularly wide dispersion, primarily due to the top quartile.
- Similar to our findings in the Canadian market, the median funds' carbon footprint in each style category is below the benchmark, although not by a statistically significant amount.

Carbon footprint sector-adjusted tilt by style



- The carbon footprint of the median fund of each of the investment style categories is very close to the benchmark after adjusting for sector deviations.
- However, the bottom quartile among world non-segregated growth portfolios is materially lower. Similarly, the top quartile of value portfolios is considerably higher. Again, this suggests that manager selection is critical.



In contrast to the Canadian market, large cap world non-segregated equity funds tend to have lower carbon footprints than those of their small/mid cap counterparts. This could be explained by the disproportionate weight of materials and energy companies in the Canadian large cap universe. Furthermore, selection among small/mid cap and market neutral non-segregated equity funds is critical due to the wide dispersion of the carbon footprints.

As found in the Canadian analysis, the median fund in each market cap category for world non-segregated funds is below the benchmark, although not by a statistically significant amount. The carbon footprint of the median fund in each of the capitalization categories is roughly equivalent to the benchmark after adjusting for sector deviations, implying that manager selection can be critical in limiting portfolio exposure to carbon emissions.

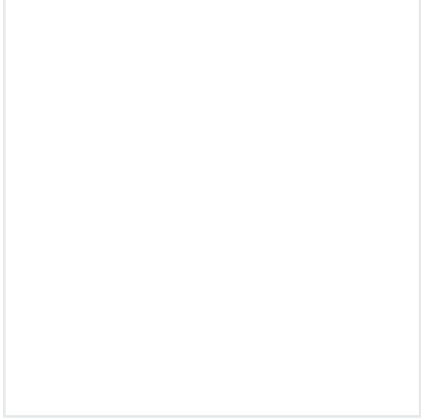
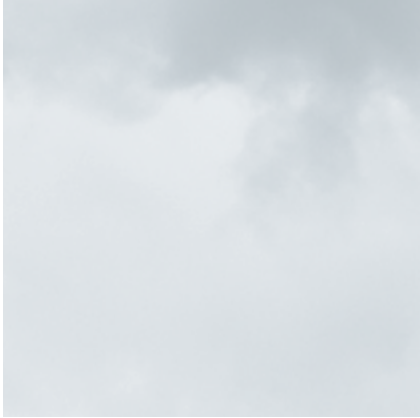
In terms of style, similar to the Canadian pooled-fund universe, the global growth portfolios offered tend to have lower carbon footprints than those of their value counterparts. Non-segregated global value portfolios have a much wider range of carbon footprints than do growth or core portfolios; therefore, fund selection among value strategies can be very important for investors looking to limit carbon exposure. On balance, world non-segregated growth funds offer the lowest carbon footprints, even after adjusting for the respective benchmarks. Also, their range of tilts is much narrower than that of value funds.

4

Case studies: How investors use carbon footprint information

In order to better consider carbon footprint analysis in the context of unique investment organizations, we have included four case studies in this report. We believe it is valuable to include such portfolios in order to perform a complete analysis and demonstrate how some institutions go about using the information about their portfolio carbon footprints. We hope that these case studies will help develop a general understanding of climate change-related risks and opportunities and how they can impact portfolio construction.

The participants in the study are two endowment funds (Toronto Atmospheric Fund and Community Foundation of Ottawa), one Canadian public pension fund and one workers' union fund in Canada. All participants provided one externally managed Canadian equity strategy from their funds for the purposes of this study. This produced a variety of data for carbon footprint assessment among the different investment portfolios.



Toronto Atmospheric Fund

The portfolio selected for analysis in this project is the Canadian equity mandate of the TAF, managed by one of TAF's two managers.

Summary of findings

TAF's Canadian equity portfolio showed a lower carbon footprint relative to the benchmark as at Sept. 30, 2009. This was primarily explained by sector allocation, with security selection playing a lesser role.

1. The utilities sector was underrepresented in the portfolio relative to the benchmark. Since the utilities sector is the most carbon-intensive sector from the benchmark, based on Trucost data, the result of such a lower exposure weighting in the sector was a lower carbon footprint of the portfolio as compared to the benchmark. In addition, most of the portfolio exposure to the utilities sector was concentrated on one specific security that had a significantly lower carbon footprint relative to the rest of the sector, which further lowered the carbon footprint of the portfolio compared to the benchmark.
2. The portfolio had significantly less exposure to energy companies than the benchmark; specifically, the benchmark's energy exposure was almost twice that of the portfolio's. This underweight position in a carbon-intensive sector significantly reduced the portfolio's carbon footprint. The data are less clear in providing an understanding of the impact of security selection because the carbon footprint coverage of the energy stocks in the portfolio was only 56%. Further research would need to be conducted on the carbon footprint of the energy sector of TAF's Canadian equity portfolio to determine the carbon footprint contribution from a security selection point of view.
3. Almost 50% of the total portfolio was invested in the financial sector, which has the lowest carbon footprint of any sector in the benchmark. This significant overweight in financials as compared to the benchmark had an important role in lowering the carbon footprint of the portfolio.

Description

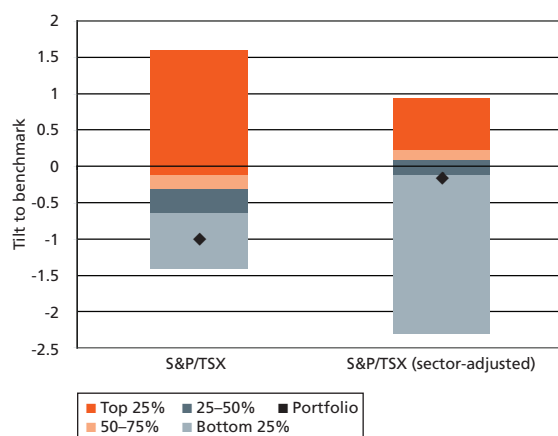
Portfolio: The portfolio was composed of 84 securities as at Sept. 30, 2009. Trucost had carbon footprint data for 61% of TAF's Canadian equity portfolio.

1. Readers should note that Trucost provides carbon footprint data on 100% of the Canadian S&P/TSX 60, large cap stocks in Canada. TAF's Canadian equity portfolio was highly weighted in small cap securities often not included in the S&P/TSX 60. This explains such coverage.
2. Additional analysis showed that only 16% of the TAF's Canadian equity portfolio was invested in the energy and materials sectors, which are among the most carbon-intensive sectors in the benchmark. For comparison, the benchmark is invested close to 46% in these two latter sectors. Although we did not have carbon footprint data for half of TAF's energy and materials sector exposure, which is not enough for a detailed analysis, some general conclusions can still be drawn from the data available.

Canadian pooled-fund universe: The Canadian pooled-fund universe was composed of 40 Canadian institutional pooled funds as at Sept. 30, 2009.

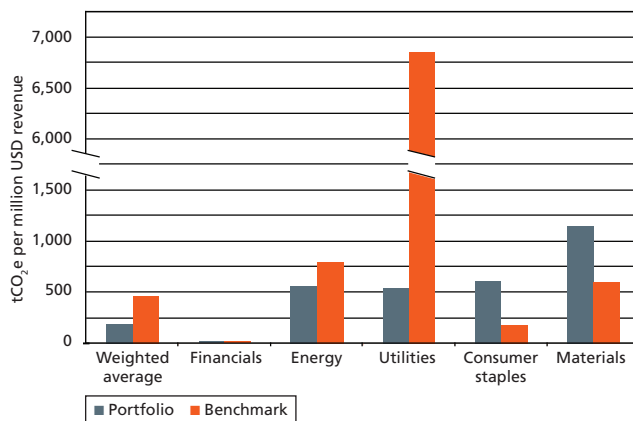
Benchmark: S&P/TSX Capped Composite Index.

Carbon footprint tilts of the portfolio and Canadian institutional pooled funds relative to the S&P/TSX Capped Composite Index



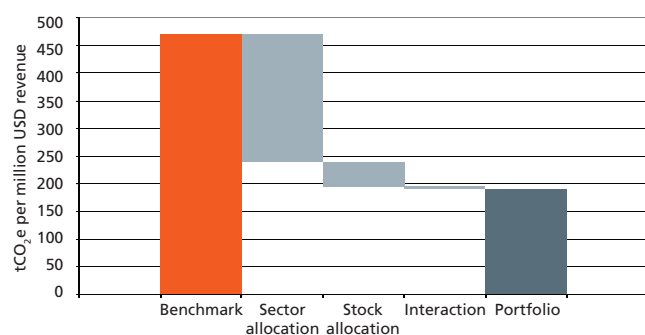
- The chart exhibits the carbon footprint of the portfolio compared to that of the benchmark and Mercer's Canadian equity pooled fund as at Sept. 30, 2009. The portfolio carbon footprint is significantly lower than the benchmark's, ranking among the least carbon-intensive strategies in the Canadian pooled-fund universe (that is, the fourth quartile).
- When sector allocation is removed (sector-adjusted tilt, on right bar), the portfolio carbon footprint is in line with that of the benchmark. This suggests that differences in sector weightings have an important impact on the lower carbon footprint of the portfolio.

Carbon footprint



- This chart compares the weighted average carbon footprint for the entire portfolio (grey bars) to the benchmark (orange bars) by sector.
- As described above, the lower carbon footprint of the portfolio relative to the benchmark due to sector underweights in the utilities and energy sectors more than offsets the larger carbon footprint of the portfolio in the consumer staples and materials sectors.

Asset allocation and stock selection contributions to the difference between the benchmark and portfolio carbon footprints



- This chart provides insight into what factors contributed most to the difference in carbon footprint between the portfolio and the benchmark – namely, sector allocation and, to a lesser degree, the stock selection within a sector.
- The orange bar represents a contribution that lowers the carbon footprint.

Stock	Sector	Portfolio weight	Benchmark weight	Stock carbon footprint	Carbon footprint of sector	% of weighted average
Saputo Inc.	Consumer staples	3.4%	0.3%	944.2	182.1	26.6%
Suncor Energy Inc.	Energy	3.8%	47%	594.2	800.2	18.7%
Canadian National	Industrials	2.5%	20%	573.3	384.4	12.0%

- This table identifies the top three contributors to the portfolio carbon footprint at the stock level. Notably, the highest contributor to the portfolio carbon footprint is the Saputo exposure, which is both overweighted relative to the benchmark and has a high carbon footprint (more than four times the weighted average of the carbon footprint of the sector).

Feedback from the investors on this carbon footprint assessment

1. Description of the fund

TAF was established in 1991 with an endowment of CAD23 million and a mandate to support and advance municipal solutions to climate change and air pollution. The fund has a diversified asset base across equities, fixed income and direct investments (whereby TAF lends to mandate-relevant projects that generate both financial and emission-reduction returns on investment).

2. Why did you participate in this study?

We recently redrafted our Statement of Investment Objectives & Principles to reflect our goals of aligning our investment approach with our mandate and achieving superior risk-adjusted returns. We believe that identifying and managing climate change-related risks and opportunities is an important part of this.

3. Were you surprised by the outcomes?

Since the manager's mandate was not crafted with an environment, social and governance (ESG) perspective (beyond several stock exclusions), having a lower carbon footprint than the benchmark's is a welcome surprise. We also have to be careful about interpretation because Trucost coverage of the portfolio was slim. It seems logical that the sector weights are the dominant influence, but the importance and the impact of key stock picks are also instructive.

4. Do you believe the analysis highlights material investment risks or opportunities (now or for the future)?

TAF's go-forward investment strategy is premised on the belief that carbon risk will affect performance, and will be a policy consideration, so our intention is to be prudent investors from all angles.

5. Have you discussed the findings with your manager? (and if yes, what did he or she say?)

Not yet, although TAF's interest in environmentally responsible investing has been conveyed and discussed.

6. Will you take any "next steps" as a result of this exercise?

These specific findings will definitely be discussed with our manager. In the short term, consideration could be given to disposition/acquisition of specific stocks based on carbon footprint as well as returns. This will also be an opportunity to discuss shareholder resolutions with our manager, using the Suncor shareholder resolution as a case in point.

Community Foundation of Ottawa

The portfolio selected for the analysis in this project was the Canadian equity mandate of CFO.

Summary of findings

As at Sept. 30, 2009, the portfolio's carbon footprint was lower than the benchmark carbon footprint. This was mainly driven by sector allocation, namely:

1. The portfolio had an underweight position in the utilities sector, which is the most carbon-intensive sector in the benchmark.
2. The portfolio had an overweight position in the financial sector, the lowest carbon-intensive sector in the benchmark.

3. The portfolio had a large underweight position in the materials sector, despite the fact that the securities chosen in the materials sector had a much larger weighted average carbon footprint relative to the benchmark. In fact, the carbon footprint of these securities was almost twice as large as the weighted average carbon footprint of the sector.

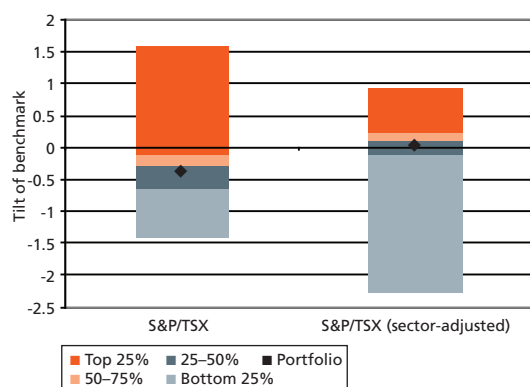
Description

Portfolio: The portfolio was composed of 26 securities as at Sept. 30, 2009. Trucost had carbon footprint coverage of 91.3% of CFO's Canadian equity portfolio.

Canadian pooled-fund universe: The Canadian pooled-fund universe was composed of 40 Canadian institutional pooled funds as at Sept. 30, 2009.

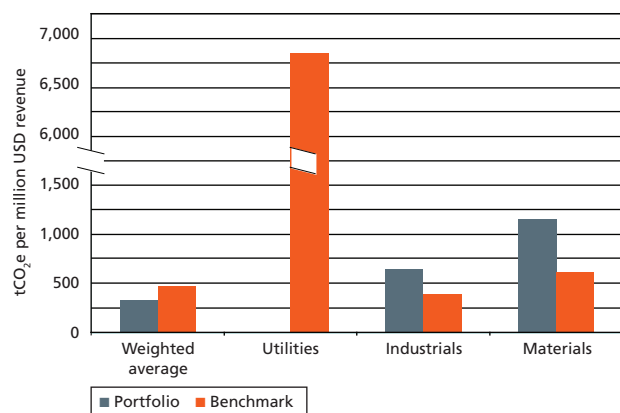
Benchmark: S&P/TSX Capped Composite Index.

Carbon footprint tilts of the portfolio and Canadian institutional pooled funds relative to the S&P/TSX Capped Composite Index



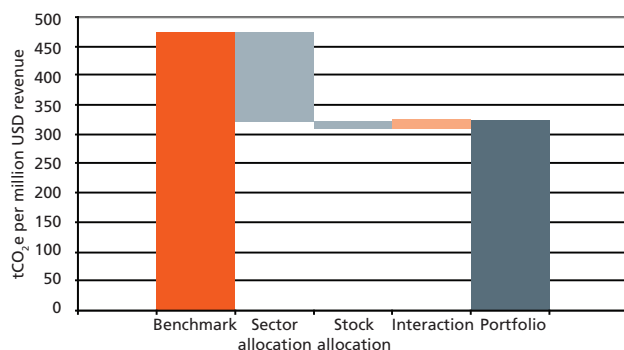
- The chart exhibits the carbon footprint of the portfolio compared to that of the benchmark and to Mercer's Canadian pooled-fund universe as at Sept. 30, 2009. The portfolio carbon footprint is lower than the benchmark's and is ranked in the third quartile.
- When sector allocation is removed (sector-adjusted tilt, right bar), the portfolio carbon footprint is in line with that of the benchmark. This suggests that differences in sector weights had an important impact on lowering the carbon footprint of the portfolio.

Carbon footprints



- This chart compares the weighted average carbon footprint for the entire portfolio (grey bar) to that of the benchmark (orange bar) by sector.
- The portfolio carbon footprint was lower than the benchmark's due to the lack of exposure to the utilities sector, the most carbon-intensive sector of the Canadian market, and an important underweight position in the materials sector. This more than offset the fact that securities selected in the industrials and materials sectors had a much larger weighted average carbon footprint than the average carbon footprint of the securities in the benchmark.

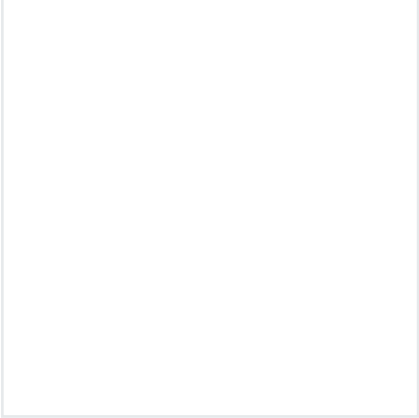
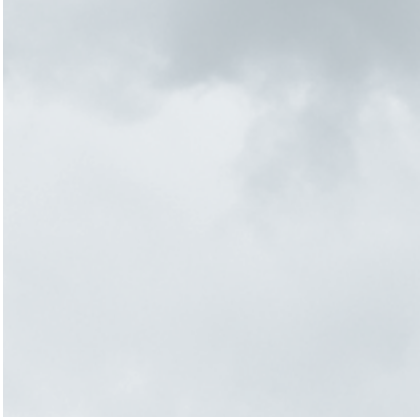
Asset allocation and stock selection contributions to the difference between the benchmark and portfolio carbon footprints



- This chart provides insight into what factors contributed most to the difference in carbon footprint between the portfolio and the benchmark – namely, the stock selection within a sector and sector allocation.
- The grey bar represents a contribution that lowers the carbon footprint. The orange bar represents the opposite.
- This chart confirms that most of the variation between the portfolio and the benchmark is driven by sector allocation and, on a much smaller scale, by security selection. The interaction factor, which as the name suggests, measures the synergies between sector allocation and security selections, had a minor negative impact on the overall portfolio's carbon footprint.

Stock	Sector	Portfolio weight	Benchmark weight	Stock carbon footprint	Carbon footprint of sector	% of weighted average
Talisman Energy Inc.	Energy	5.0%	1.5%	1355.4	804.4	21.8%
Suncor Energy Inc.	Energy	8.4%	4.7%	594.2	804.4	16.0%
TransCanada Corp.	Energy	3.7%	1.8%	1205.8	804.4	14.2%

- This table illustrates the top three contributors to the portfolio carbon footprint at the stock level. All three contributors are within the energy sector, which is the second largest carbon-intensive sector in the Canadian market.



Feedback from the investors on this carbon footprint assessment

1. Description

The CFO is a public, nonprofit organization. As an independent centre for community philanthropy, it connects donors who care with causes that matter and serves as a trusted resource for addressing issues and leveraging opportunities within the community. The Foundation comprises more than 600 endowment funds whose assets are pooled for investment purposes.

2. Why did you participate in this study?

The Foundation recently created a task force to develop a policy that guides the incorporation of responsible investing methods, where capacity allows, that are aligned with the mission and vision of CFO and to suggest investment practices that support the policy over time. The task force presented the policy and an action plan to the board for approval in April 2010. The policy is based on two core investment beliefs: (1) integrating ESG factors into investment analysis generally has a positive influence of long-term financial performance and (2) since CFO's mission is to have "an enduring impact on communities", then it makes sense to invest its assets responsibly in a way that is consistent with its mission.

3. Were you surprised by the outcomes?

Yes. The impact of stock selection is interesting. While we would have expected a higher-than-benchmark footprint due to our overweight in energy, it is diminished by the fact that our two largest holdings in energy have lower-than-benchmark carbon footprints. The opposite is true of our selection in materials, where we are significantly underweight by sector but our holdings result in very high footprints.

4. Are you satisfied with your profile?

It is difficult to say. We don't feel equipped as yet to understand all the metrics in this report to see how we might improve, but it would appear that we might be able to do better in the industrials and materials sectors. I think it is also interesting that our value-style investment approach, which favours financials and steady dividend-paying firms, has produced a portfolio with a lower carbon footprint.

5. Do you believe the analysis highlights material investment risks or opportunities (now or for the future)?

Certainly carbon risk is one we should be watching going forward. The degree to which CFO should focus on this will depend on the results of all the ESG analysis we do this year on our invested companies. As a foundation with limited resources, we will need to pick and choose our issues carefully. Having said that, with Mercer able to continually monitor our carbon footprint as part of its reports, we could perhaps set as an objective to maintain our carbon footprint at below that of the benchmark.

6. Do you plan to discuss the findings with your manager, and what expectations do you have for what might arise as a result of this conversation?

Yes. We would hope it would give him/her some ideas about what other data he/she might need to include carbon risk in his/her investment analysis. If we determine that our carbon footprint is a priority for the Foundation's responsible investing approach, we would want to know that his/her analysis would favour companies, where other factors remain equivalent, that had a lower carbon footprint.

7. What "next steps" will you take (or consider taking) as a result of this exercise?

This information is part of our learning process and we will plan on continuing to monitor carbon footprint through Mercer while determining an appropriate response to the data.

Pension plan (participating on an anonymous basis)

The portfolio selected for the analysis in this project was one of the Canadian equity mandates of a large Canadian public pension plan.

Summary of findings

As at Sept. 30, 2009, the portfolio's carbon footprint was significantly lower compared to the benchmark carbon footprint, due mainly to the following three reasons:

1. The portfolio had a lack of exposure to the utilities sector, which is the most carbon-intensive sector in the benchmark.
2. The portfolio had a larger exposure to the financials sector, the lowest carbon-intensive sector in the benchmark.

3. The portfolio had a larger exposure to the consumer staples sector in securities that had a weighted average carbon footprint lower than the sector weighted average carbon footprint.

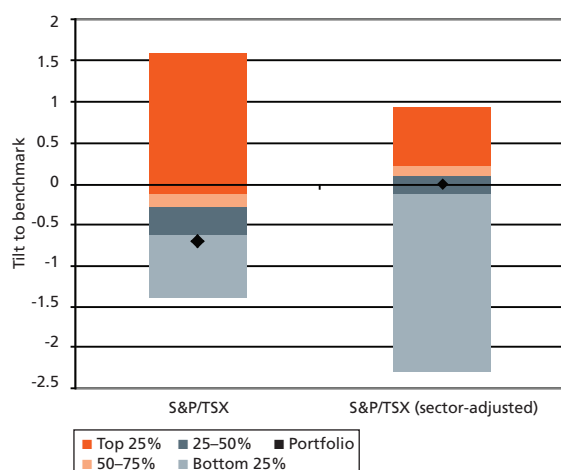
Description

Portfolio: The portfolio was composed of 66 Canadian securities as at Sept. 30, 2009. Trucost had a carbon footprint coverage of 83% of the analyzed Canadian equity portfolio.

Canadian pooled-fund universe: The Canadian pooled-fund universe was composed of 40 Canadian institutional pooled funds as at Sept. 30, 2009.

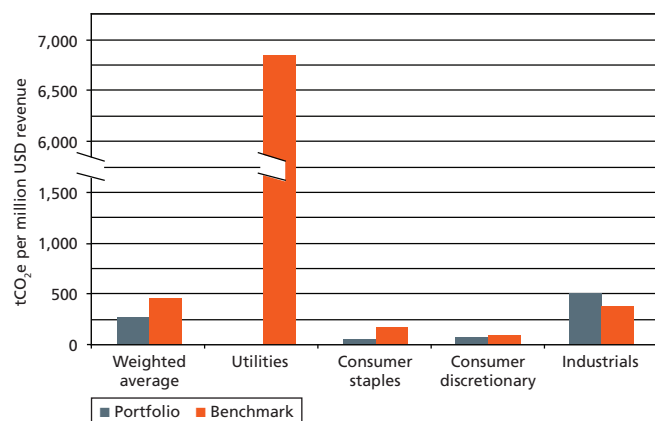
Benchmark: S&P/TSX Capped Composite Index.

Carbon footprint tilts of the portfolio and Canadian institutional pooled funds relative to the S&P/TSX Capped Composite Index



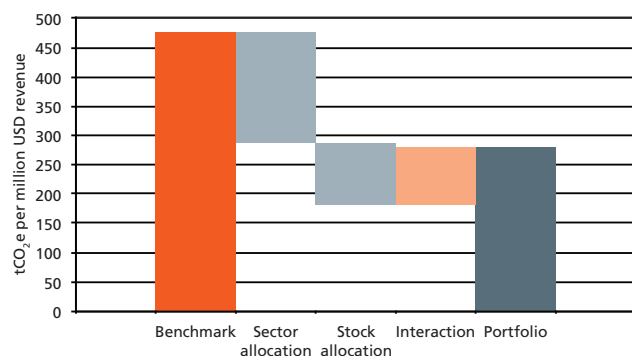
- The chart exhibits the carbon footprint of the portfolio compared to that of the benchmark and to Mercer's Canadian pooled-fund universe as at Sept. 30, 2009. The portfolio carbon footprint is lower than that of the benchmark and is ranked among the least carbon footprint intensive strategies (that is, the fourth quartile).
- When sector allocation is removed (sector-adjusted tilt, right bar), the portfolio carbon footprint is in line with that of the benchmark. This suggests that differences in sector weightings had an important impact on the lower carbon footprint of the portfolio.

Carbon footprints



- This chart compares the weighted average carbon footprint for the entire portfolio (grey bar) to that of the benchmark (orange bar) by sector.
- As described above, the lower carbon footprint of the portfolio was largely driven by the lack of exposure to the utilities sector, the highest carbon-intensive sector in the benchmark. However, the weighted average carbon footprint of the companies in the industrials and energy sectors was higher than the weighted average carbon footprint of the companies in the benchmark.

Asset allocation and stock selection contributions to the difference between the benchmark and portfolio carbon footprints



- This chart provides insight into what factors contributed most to the difference in carbon footprint between the portfolio and the benchmark – namely, the stock selection within a sector and sector allocation.
- The light grey bar represents a contribution that lowers the carbon footprint. The light orange bar represents the opposite.
- Consistent with previous findings, the lower carbon footprint of the portfolio is explained mostly by sector allocation and stock selection. The interaction factor, which is not attributable to a manager decision, increased carbon footprint.

Stock	Sector	Portfolio weight	Benchmark weight	Stock carbon footprint	Carbon footprint of sector	% of weighted average
Talisman Energy Inc.	Energy	4.4%	1.5%	1355.4	804.4	26.6%
Canadian Oil Sands Trust	Energy	1.8%	1.2%	1720.7	804.4	14.1%
Encana Corp.	Energy	6.1%	3.8%	498.4	804.4	13.7%

- This table illustrates the top three contributors to the portfolio carbon footprint at the stock level. All three contributors are within the energy sector, which is the second largest carbon-intensive sector in the Canadian market.

Feedback from the investors on this carbon footprint assessment

1. Why did you participate in this study?

We participated in the study because we are interested in the methodology of carbon footprint measure for portfolios, and to assess any opportunities or issues in risk management.

2. Were you surprised by the outcomes?

We are not particularly surprised by the outcome. Although we are not unsatisfied with the profile, it is not evident to us how there is a great deal of value in sharing the results with our manager. It might have been different if the footprint of the portfolio differed significantly from the benchmark or if the difference was only attributable to stock selection.

3. Do you believe the analysis highlights material investment risks or opportunities (now or for the future)?

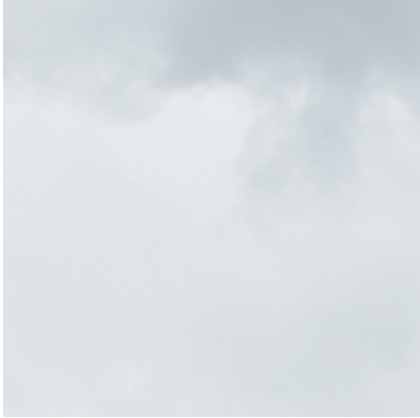
At this time, we do not see any material investment risk.

4. Have you discussed the findings with your manager? (and if yes, what did he or she say?)

We do not plan to engage in any discussion on the topic with the manager.

5. Will you take any “next steps” as a result of this exercise?

We will continue to use available data to evaluate the carbon risk of our externally managed portfolio and continue to evaluate potential risk related to competition, regulation and reputation.



Comité syndical national de retraite Bâtirente

The portfolio selected for the analysis in this project is the Canadian equity mandate of the Comité syndical national de retraite Bâtirente (Bâtirente) pension fund.

Summary of findings

As at Sept. 30, 2009, the portfolio's carbon footprint was slightly lower than the benchmark carbon footprint. When the sector allocation effect was removed, Bâtirente's carbon footprint was higher than the benchmark carbon footprint, suggesting that stock selection increased the portfolio's carbon footprint. One particular stock in the consumer goods sector appears to be the primary cause of this increase. The following reasons also impacted the results:

1. The portfolio had an underweight position in the utilities sector, which is the most carbon-intensive sector in the benchmark.
2. The portfolio had an overweight position in the information technology sector, which, relative to

the benchmark, has a lower weighted average carbon footprint.

3. The portfolio had a larger exposure to securities in the industrial sector, which had a lower weighted average carbon footprint compared to the sector weighted average carbon footprint.

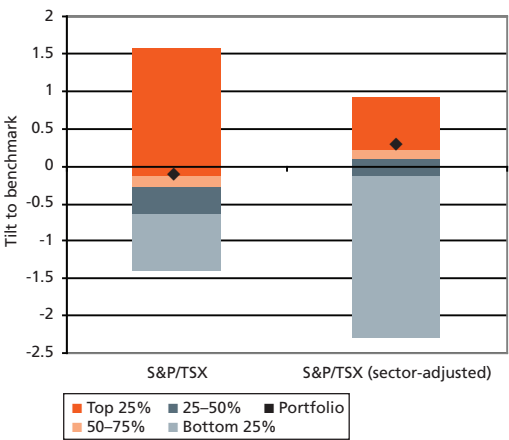
Description

Portfolio: The portfolio was composed of 82 securities, which included 35 securities and ETFs from allocation to another Canadian equity portfolio as at Sept. 30, 2009. Trucost had a carbon footprint coverage of 83% of Bâtirente's Canadian equity portfolio.

Canadian pooled-fund universe: The Canadian pooled-fund universe was composed of 40 Canadian institutional pooled funds.

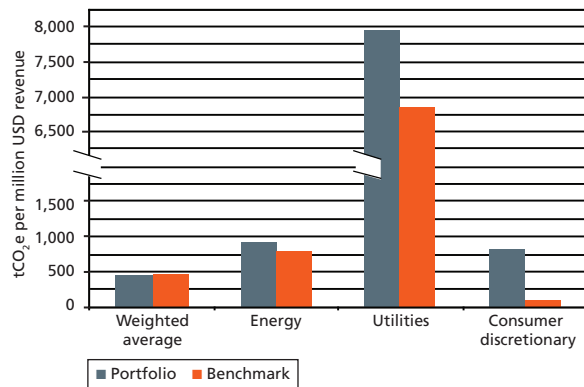
Benchmark: S&P/TSX Capped Composite Index.

Carbon footprint tilts of the portfolio and Canadian institutional pooled funds relative to the S&P/TSX Capped Composite Index



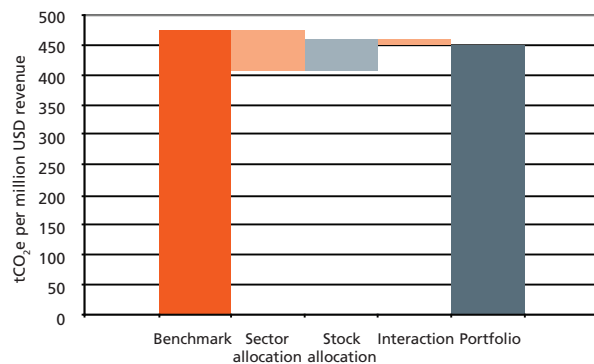
- The chart exhibits the carbon footprint of the portfolio compared to that of the benchmark and to Mercer's Canadian pooled-fund universe as at Sept. 30, 2009. The portfolio carbon footprint is slightly lower than the benchmark's and is ranked first quartile, among the highest carbon footprint-intensive strategies.
- When sector allocation is removed (sector-adjusted tilt, right bar), the portfolio carbon footprint is higher than the benchmark carbon footprint. This suggests that differences in sector weights had an important impact on lowering the carbon footprint of the portfolio.

Carbon footprints



- This chart compares the weighted average carbon footprint for the entire portfolio (grey bar) to the benchmark (orange bar) by sector.
- The carbon footprint of the portfolio is slightly lower than the benchmark's. The portfolio had a minimal exposure to the utilities sector, the largest carbon-intensive sector in the Canadian market. The weighted average carbon footprint of the companies in the portfolio in the energy, utilities and consumer discretionary sectors is higher than the weighted average carbon footprint of the companies in the benchmark.

Asset allocation and stock selection contributions to the difference between the benchmark and portfolio carbon footprints



- This chart provides insight into what factors contributed most to the difference in carbon footprint between the portfolio and the benchmark – namely, the stock selection within a sector and sector allocation.
- The light orange bar represents a contribution that lowers the carbon footprint. The light grey bar represents the opposite.
- While the sector allocation lowered the carbon footprint of the portfolio, the security selection contributed to the increase in the portfolio's carbon footprint. The interaction factor, which is not attributable to a manager decision, had a minimal impact.

Stock	Sector	Portfolio weight	Benchmark weight	Stock carbon footprint	Carbon footprint of sector	% of weighted average
Talisman Energy Inc.	Energy	4.8%	1.5%	1355.4	804.4	18.7%
Canadian Natural Resources Ltd.	Energy	4.3%	3.2%	1203.1	804.4	15.0%
Gildan Activewear Inc.	Consumer discretionary	3.3%	0.2%	1097.8	108.3	10.5%

- This table indicates the contributors to the portfolio carbon footprint at the stock level. The top two contributors were in the energy sector, a high carbon-intensive sector, while the third largest contributor was within the consumer discretionary sector. The latter security had an average carbon footprint of close to 10 times the weighted average carbon footprint of the sector.



Feedback from the investors on this carbon footprint assessment

1. Description of the fund

Bâtirente was created in 1987 to give workers access to retirement plans. More than 25,000 members in four hundred groups, most of which are labour unions affiliated with the Confédération des syndicats nationaux (CSN), have Bâtirente retirement plans. Bâtirente manages more than CAD700 million.

2. Why did you participate in this study?

We undertook this study to measure the carbon footprint of our investment and identify methods to reduce the carbon risk.

3. Were you surprised by the outcomes?

Yes and no. We are over the benchmark carbon footprint because of the stock selection of a few securities that have a high carbon footprint in sectors that do not particularly have high carbon footprints (for example, Gildan).

4. Do you believe the analysis highlights material investment risks or opportunities (now or for the future)?

Yes, in security selection as well as in sector allocation.

5. Have you discussed the findings with your manager? (and if yes, what did he or she say?)

Yes, we will talk about it and we are expecting that he/she will do his/her own analysis and tell us if he/she sees benefits in beating the benchmark carbon footprint and how he/she will deal with it.

6. Will you take any “next steps” as a result of this exercise?

We will engage in a discussion with the portfolio manager and see if the carbon footprint analysis should be updated every year and how much it would cost.

5

Canadian investor risks in the oil sands

WWF-Canada commissioned global environmental data provider Trucost to assess the carbon-related investment implications of Canadian institutional pooled funds' investments in the Canadian oil sands through their ownership of oil and gas companies.

Trucost's Anastassia Filimonova and Liesel van Ast provide the study results in this chapter.

Energy investments spur oil sands emissions

The 181 active strategies in the Canadian pooled funds held more than USD7.7 billion⁴ in over 180 companies in the energy sector. This represents 17% of the combined value of holdings (more than USD46.5 billion) at Dec. 31, 2009. The sector contributed 13.5% to the total carbon footprint of the pooled institutional funds. When the high-polluting utilities sector is excluded, the energy sector contributed to 27% of the total carbon footprint.

Note: This chapter does not reflect the opinion of Mercer. Mercer gives no representations or warranties as to the accuracy of the information and accepts no responsibility or liability, including for indirect, consequential or incidental damages for any error, omission or inaccuracy in such information prepared by Trucost.

⁴ Based on aggregated Canadian pooled-fund holdings; many of the firms operate globally and the majority of free float equity is held outside Canada. While 17% is a relatively high proportion to be invested in a sector, it is a lower allocation than the sector weighting in the TSX. Not all funds will be benchmarked against the TSX.

Many energy companies held in the funds are expanding their oil production from oil sands in Alberta. Extraction processes used in the oil sands (see box on oil sands production below) emit far more GHG emissions than do conventional oil production techniques. On average, the oil sands industry emits 0.0855-0.1335 tonnes of CO₂e to produce one barrel of oil (bbl), according to The Pembina Institute (2005) and the United States Department of Energy (2008).⁵ This is approximately three times more carbon intensive than conventional oil production, which emits an average of 0.0286-0.0352 tonnes of CO₂e per barrel.

Oil sands expansion is contributing to rising GHG emissions in Canada. However, demand for oil produced from oil sands could fall under policy measures to cut GHG emissions from fuel consumption in Canada and the United States. Oil sands projects are also financially exposed to rising carbon costs under cap-and-trade programs. The pooled-fund investments in oil and gas companies with oil sands operations could be indirectly contributing to rising emissions while putting fund returns at risk.

Oil sands production

Processes to produce oil from oil sands include:⁶

- Surface mining: Oil sands deposits are extracted by “open pit” processes. This method causes significant damage to land cover.
- Steam Assisted Gravity Drainage (SAGD) or Cyclic Steam Stimulation (CSS): For deeper deposits, steam is injected into the ground to help the oil flow to the surface. The in situ process uses more water and energy than does surface mining.
- Upgrading: Bitumen extracted can be converted into lighter synthetic crude oil or “syncrude” by removing carbon or adding hydrogen. A catalyst can be used to remove sulphur, nitrogen and metals. Upgrading is energy and water intensive.

Scope of oil sands analysis

Trucost identified the funds’ 20 largest investments in energy companies that operate in the Canadian oil sands, based on equity holdings data provided by Mercer. The pooled funds had more than USD3.7 billion invested in the 20 companies examined with oil sands operations. The value of investments in these companies amounted to 48% of the total assets allocated to the energy sector. Given the significant market capitalizations of the 20 firms (more than USD1.8 trillion), the funds’ ownership represents 0.2% of the combined values of the companies as at Dec. 31, 2009. The funds are invested in further oil and gas companies that own or operate oil sands projects.

The latest available data on oil sands production levels (barrels of oil per day) were extracted from the 2008 annual, 10-K and 20-F reports of the top 20 companies.

Trucost identified five companies that have the largest investments from the pooled funds. GHG emissions data for their oil sands projects were collected from Environment Canada. Trucost summed up the companies’ owned oil production (bbl/day) and GHG emissions from each oil sands project to calculate their carbon intensities. Different processes contribute to different emissions levels and outputs at various projects.

Data on proved Canadian oil sands oil reserves were collected from the 11 companies that reported this information in their 2008 annual, 10-K and 20-F reports. Trucost applied the range in average industrywide carbon intensities to reserve data to calculate potential future GHG emissions from oil sands production. A projected carbon price for 2020, based on possible future-linked cap-and-trade systems in Canada and the United States,⁷ was applied to these emissions to identify potential future exposure to carbon costs.

5 Woynillowicz, D., Severson-Baker, C., Reynolds, M., The Pembina Institute (2005), Oil Sands Fever, The Environmental Implications of Canada’s Oil Sands Rush, <http://pubs.pembina.org/reports/OilSands72.pdf>, accessed March 2, 2010; and National Energy Technology Laboratory, Department of Energy, United States of America (2008), Development of Baseline Data and Analysis of Life Cycle Greenhouse Gas Emissions of Petroleum-Based Fuels, <http://www.netl.doe.gov/energy-analyses/pubs/NETL%20LCA%20Petroleum-Based%20Fuels%20Nov%202008.pdf>, accessed March 2, 2010.

6 WWF-UK, The Co-operative Financial Services (2008), Unconventional Oil, Scraping the bottom of the barrel?, <http://www.netl.doe.gov/energy-analyses/pubs/NETL%20LCA%20Petroleum-Based%20Fuels%20Nov%202008.pdf>, accessed March 2, 2010.

7 Bramley, M., Partington, P.J., Sawyer, D., The Pembina Institute and International Institute for Sustainable Development (2009), Linking National Cap-and-Trade Systems in North America, Clean Energy and Climate Action: A North American Collaboration, Draft Paper for Discussion, http://www.iisd.org/pdf/2009/linking_nat_cap_north_america.pdf, accessed March 2, 2010.

Top 20 oil sands investments

The largest investments in oil and gas companies that operate in the Canadian oil sands are listed below, based on the combined value of holdings in the pooled funds (see Table 1). Many of the companies are involved in joint-venture oil sands projects.

Table 1: Top 20 oil sands investments

	Company name	Combined value of holdings (USD millions) in the Canadian pooled funds*	Oil sands production 2008 (barrels per day)	Company's Canadian oil sands production/ company's global oil production (%)
1	Suncor Energy ⁸	916	228,000	100
2	Canadian Natural Resources Ltd.	819	65,000	21
3	Cenovus Energy Inc. ⁹	432	30,183	23
4	Total S.A.	330	8,000	<1
5	Royal Dutch Shell Plc ¹⁰	295	90,500	5
6	Nexen Inc.	196	24,800	12
7	Husky Energy Inc.	105	4,800	<1
8	BP Plc	86	-	-
9	Petrobank Energy and Resources Ltd.	86	-	-
10	ConocoPhillips ¹¹	66	58,000	6
11	Chevron Corporation	60	27,000	1
12	PetroChina Company Ltd.	57	-	-
13	Canadian Oil Sands Trust	56	106,179	100
14	Imperial Oil Ltd.	52	219,250	86
15	Occidental Petroleum Corporation	30	-	-
16	Penn West Energy Trust ¹²	29	27,366	25
17	Statoil ASA	22	-	-
18	Exxon Mobil Corporation ¹³	22	153,256	6
19	Enerplus Resources Fund	14	-	-
20	Inpex Corporation	8	-	-

* Figures are rounded up.

8 Suncor and Petro-Canada merged on Aug. 1, 2009 (<http://www.suncor.com/en/newsroom/2418.aspx?id=1110535>, accessed March 2, 2010). Suncor production figures are for 2008 and exclude Petro-Canada's tar sands assets.

9 Cenovus commenced operations Dec. 1, 2009, when Encana separated its natural gas and oil assets. Cenovus represents assets and operations of the Integrated Oil and Canadian Plains Divisions of Encana, including oil sands projects. Data are based on Cenovus assets as operated by Encana prior to Dec. 1, 2009. See <http://www.cenovus.com/invest/docs/2009/2009-aif.pdf>, accessed April 19, 2010.

10 Production and GHG emissions data for the Athabasca Oil Sands Project were allocated to Royal Dutch Shell on a percentage ownership (60%) basis.

11 ConocoPhillips announced on April 12, 2010, that it has agreed to sell its 9.03% interest in Syncrude to subsidiaries of Sinopec International Petroleum Exploration and Production Company.

12 Trucost assumed that the 27,366 barrels per day reported for heavy oil production in the company's annual report were all from tar sands, although the figure may include other sources. Data for tar sands production were not reported separately.

13 Figures for ExxonMobil represent 69.9% of the production reported by Imperial Oil Ltd., in line with Exxon's interest in the company. There is therefore double-counting of production data for Imperial Oil in the table.

Table 1 shows the share of each company's total oil production that came from Canadian oil sands in 2008, based on their ownership of oil sands projects at the time. Each company's percentage ownership reflects its share of equity in an operation, rather than its control over production processes.¹⁴ Equity share reflects economic interest and related rights to the risks and rewards from oil sands projects. The figures reflect the latest publicly available data at the time of writing.

Seven companies did not produce oil from oil sands in 2008 (BP Plc, Petrobank Energy and Resources Ltd., PetroChina Company Ltd., Occidental Petroleum Corporation, Statoil ASA, Enerplus Resources Fund and Inpex Corporation). However, these companies have significant Canadian oil sands leases and ownership of projects that are in the planning, construction or development stages. Company stakes in oil sands projects outside Canada are excluded from this analysis.

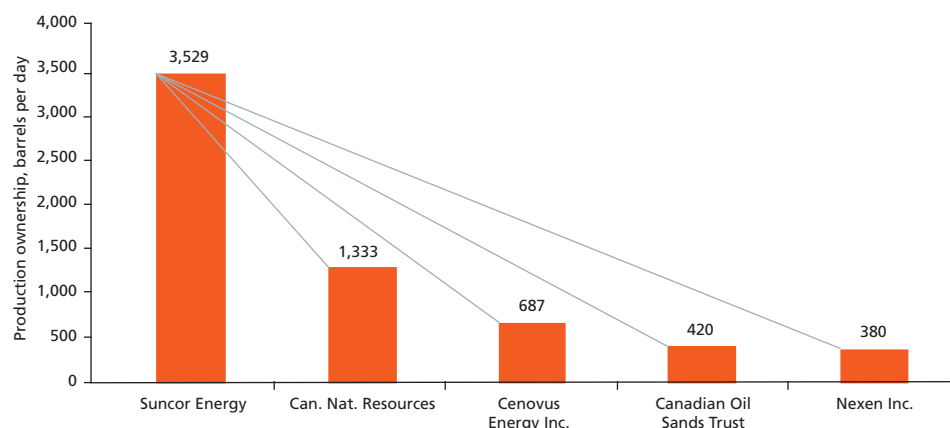
In summary:

- **Thirteen companies held in the funds have interests in 11 oil-producing projects.** The projects produced more than 340 million barrels of oil in 2008. Based on

their stakes in each project, the companies produced a total of 1,042,333 bbl/day from oil sands in 2008. Oil produced from oil sands amounted to 10% of the companies' total oil production (10,696,915 bbl/day).

- **The 11 oil sands projects emitted 33.4 million tonnes of GHGs, measured as CO₂e.** Syncrude Canada Ltd., which produced the most oil, was responsible for the greatest amount of emissions (36% of the total). Imperial Oil and Suncor Energy, through its acquisition of Petro-Canada, have significant stakes in Syncrude Canada Ltd.
- **For every barrel of oil produced, oil sands projects analyzed emitted 0.1229 tonnes of CO₂e.** Their combined carbon intensity was based on the weighted average carbon intensity of each of the 11 oil-producing projects. Between 2006 and 2008, carbon intensity increased at six projects.
- **Together the funds "own" 7,035 bbl/day.**¹⁵ Trucost allocated each company's oil sands production (bbl/day) to the funds in proportion to the value of holdings as a percentage of market capitalization (as at Dec. 31, 2009). Fifty percent of the production "owned" came from their investments in Suncor (see Chart 1).

Chart 1: Fund ownership of oil sands production by company – top five



Source: Trucost Plc

¹⁴ World Business Council for Sustainable Development and World Resources Institute (2004), The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard.

¹⁵ The average carbon intensity for 11 projects analyzed was applied to production owned to identify potential absolute emissions. However, actual emissions may vary since the calculation does not reflect the weightings of company stakes in various projects that have different carbon intensities.

Carbon risks from top five oil sands investments

Canada's regulatory framework for industrial GHG emissions floundered in 2009 with the withdrawal of plans to require oil and gas facilities to reduce their carbon intensity – CO₂e emissions per unit of output – by 18% below 2006 emissions by 2010. The Canadian government aims to follow the US lead in establishing a cap-and-trade system to help achieve a target to cut emissions by 17% from 2005 levels by 2020. Linked cap-and-trade programs in Canada and the US could result in a carbon price of CAD31 (USD 30.28) per tonne in Canada in 2020, according to a draft discussion paper by The Pembina Institute and International Institute for Sustainable Development.¹⁶

In short, it is quite possible that oil sands projects will be exposed to carbon costs under future legislation that sets mandatory caps on emissions. Firms that do not meet targets will likely be able to purchase tradable credits or offset credits to comply with regulations. Meanwhile, oil sands facilities in Alberta are currently covered by a provincial Climate Change and Emissions Management Act and related Specified Gas Emitters Regulation.¹⁷ Facilities that emit more than 100,000 tonnes of GHGs annually must cut their emissions intensity by 12% below a 2003-2005 baseline annually. All 11 projects analyzed for this study meet the threshold. If they do not meet the mandatory intensity target, they can comply by purchasing carbon credits or contributing CAD15 per tonne of CO₂e to a Climate Change and Emissions Management Fund. In 2008, industrial facilities covered by the scheme cut emissions by 6.5 million tonnes of CO₂e and paid CAD82.3 million into the fund.¹⁸

Oil sands operations could also be exposed to carbon costs passed on by suppliers through higher input costs, for instance, by natural gas producers and electricity providers that generate significant emissions upstream from projects. Fluctuating oil prices and competition from more carbon-efficient conventional oil producers could make it difficult for facilities that fail to cut their emissions intensity to pass carbon costs on to consumers without losing market share. Future demand for oil from oil sands could be limited by shifts toward low-carbon purchasing and emission standards. For instance, the retailer Whole Foods is dropping suppliers that source fuel from oil sands in order to reduce its carbon footprint.¹⁹ Low carbon fuel standards in the US and the European Union aim to reduce lifecycle GHG emissions of fuels, taking into account upstream emissions from extraction and production.

Company oil sands carbon intensity

Trucost analyzed the carbon intensity of the funds' main oil sands investments to identify potential risk from facilities with rising emissions intensities. Trucost analyzed data to calculate the carbon intensity of oil sands projects owned by the top five companies held in the pooled funds – Suncor Energy, Canadian Natural Resources, Cenovus Energy Inc., Total S.A. and Royal Dutch Shell. Trucost's analysis of their oil sands projects excludes emissions from cogeneration facilities, where these are reported separately to Environment Canada. The analysis also excludes lifecycle emissions from outsourced activities and downstream impacts from fuel transportation and use.

Carbon intensity – based on levels of GHG emissions relative to oil production (bbl/day) – increased at all six projects that produced oil and reported greenhouse emissions data to Environment Canada between 2006 and 2008: Athabasca Oil Sands Project (Royal Dutch Shell, Chevron, Marathon Oil), Christina Lake (Cenovus, ConocoPhillips), Foster Creek (Cenovus, ConocoPhillips), Peace River (Royal Dutch Shell), Suncor Energy Inc. Oil Sands (Suncor Energy) and Wolf Lake/Primrose (Canadian Natural Resources).

¹⁶ Bramley, M., Partington, P.J., Sawyer, D., The Pembina Institute and International Institute for Sustainable Development (2009), Linking National Cap-and-Trade Systems in North America, Clean Energy and Climate Action: A North American Collaboration, Draft Paper for Discussion.

¹⁷ For more information, see <http://environment.alberta.ca/0915.html>, accessed Feb. 19, 2010.

¹⁸ For more information, see <http://alberta.ca/acn/200904/25761CEE17478-A430-B24A-B65903CB1372560F.html#>, accessed Feb. 17, 2010.

¹⁹ McNulty S., Financial Times, Feb. 10, 2010, Suppliers of oil sands fuel shunned.

Increases in carbon intensity at a project level indicate rising exposure to carbon costs under federal and provincial climate change policies. Operators and owners of oil sands projects with the greatest rises in carbon intensity could be most exposed to regulatory compliance costs.

Significant variations in carbon intensity at a project level reflect different processes used. For instance, the Canadian Natural Resources' Wolf Lake/Primrose project uses CSS and SAGD technologies, whereas the Cenovus projects use SAGD technologies only. Some projects include upgrading facilities, while others outsource this process. The variations also reflect different stages of development at oil sands facilities, as well as potential to improve operating carbon efficiency.

Where operations include extraction and upgrading facilities, exposure to carbon costs would be largely direct from operations. Projects that outsource processes such as upgrading and power generation could be exposed to further carbon costs in their supply chains. Exposure to carbon costs from oil sands operations would also vary at a company level.

Future oil sands carbon risks

Trucost assessed potential fund exposure to carbon costs from proved Canadian oil sands oil reserves. Eleven companies reported 12,458 million barrels of proved oil sands reserves for potential future exploitation, which amounts to 30% of their total proved oil reserves (see Table 2). The other nine companies in the top 20 did not publicly report data on oil sands reserves separately.

Table 2: Oil sands proved reserves and ownership²⁰

Company name	Oil sands proved reserves (million barrels)	Proportion of total oil reserves (%)
Suncor Energy	2,476	100
Canadian Natural Resources Ltd. ²¹	2,350	71
Exxon Mobil Corporation ²²	2,090	17
Imperial Oil	1,364	96
Canadian Oil Sands Trust	1,000	100
Royal Dutch Shell Plc ²³	997	22
Nexen Inc. ²⁴	577	69
ConocoPhillips ²⁵	729	13
Cenovus Energy Inc.	480	48
Chevron Corporation ²⁶	332	4
Penn West Energy Trust ²⁷	62	18
Total	12,457	30

The table only includes proved oil sands reserves reported by the companies. However, further oil sands reserves may be available to them, as many own leases in the Athabasca region of Canada, where reserves are only estimated. Most of the companies analyzed have plans and construction approvals to expand their existing oil sands projects or construct new ones but have not committed to particular dates for expansion.

²⁰ Data on reserves for undeveloped leases, which are mainly estimated, were excluded from this study.

²¹ The figure refers to barrels of synthetic crude oil. Reserves were based on upgrading bitumen.

²² The figure includes 69.9% of the reserves held by Imperial Oil and Kearn project proved reserves.

²³ Peace River reserves were not reported and were therefore excluded.

²⁴ Nexen's Long Lake project is developing only 10% of the company's owned Athabasca tar sands leases.

²⁵ The figure includes reserves from interests in Syncrude, Foster Creek and Christina Lake projects. Information was not available for reserves at a Surmont project.

²⁶ Tar sands reserves were not reported in the company's 2008 annual report. The figure was calculated based on reserves reported by Royal Dutch Shell for the Athabasca Oil Sands Project.

²⁷ Trucost assumed that the figure reported as heavy oil reserves referred to tar sands, but other heavy oil reserves may be included. Tar sands reserves were not clearly reported separately.

The higher cost of oil sands extraction compared with conventional oil production makes the profitability of oil sands projects highly dependent on oil market prices. The price sensitivity of oil sands operations makes their income streams particularly volatile compared to conventional production. Economic uncertainty and a relatively low oil price led to the majority of firms suspending, postponing or rescheduling expansion and construction works during 2009. Information on the amount the companies plan to spend on specific projects in a particular timeframe is scarce.

Carbon capture and storage R&D

The oil sands industry is currently exploring the potential to use CCS technologies to separate, capture, transport and store CO₂ emissions from production processes at oil sands operations. Companies including Shell Canada, Suncor and Nexen are participating in CCS research and development projects in Alberta. The Alberta provincial government is providing CAD2 billion to fund four commercial-scale CCS projects.²⁸

CCS is energy intensive and could increase oil sands production costs by 5-30%.²⁹ While costs would be site-specific and vary, they could range from USD75 to more than USD230 per tonne of CO₂ for oil sands facilities.^{30,31}

Costs may outweigh benefits. CCS would not reduce emissions at all facilities and could lower upstream emissions from oil sands by just 10-30% by 2020 or up to 50% by 2050.³² Uncertainties about the technology's application and the security of storage present technical, liability, safety and environmental risks.

Based on the value of equity holdings in the 11 companies as a percentage of their market capitalizations, Trucost assessed fund "ownership" of oil sands reserves.

The funds "own" 115 million barrels of oil sands proved reserves. If these reserves were exploited at the average carbon intensity of oil sands production of 0.0855-0.1335 tonnes of CO₂e/bbl (see page 30), they would emit 9.83 million to 15.35 million tonnes of CO₂e. Actual emissions could be lower if projects deploy more efficient technologies and cleaner fuels. Many of the oil companies aim to develop carbon capture and storage (CCS) technologies to sequester emissions with the help of government funding. However, CCS is highly costly and carries environmental and financial risks (see box on carbon capture and storage R&D).

If the companies had to pay the projected carbon price of USD30.28 per tonne of CO₂e in 2020 under linked cap-and-trade programs in Canada and the US,³³ carbon costs for projected emissions from owned reserves would total USD297 million to USD464 million. While policy uncertainties remain and some allowances are likely to be allocated free of charge, modelling potential carbon costs provides insight into future exposure in a carbon-constrained economy. While companies may be able to pass on a share of carbon costs, their ability to do so will be limited by competition from lower-carbon fuel suppliers with lower-carbon risks. Exposure to carbon costs at a company level would vary significantly. Fund ownership of oil sands reserves is greatest through investments in Canadian Natural Resources.

28 For more information, see <http://www.energy.gov.ab.ca/Initiatives/1438.asp>, accessed March 2, 2010.

29 Farrell A.E., Brandt A.R., (2006), Risks of the oil transition, Environmental Research Letters, Vol. 1, No. 1.

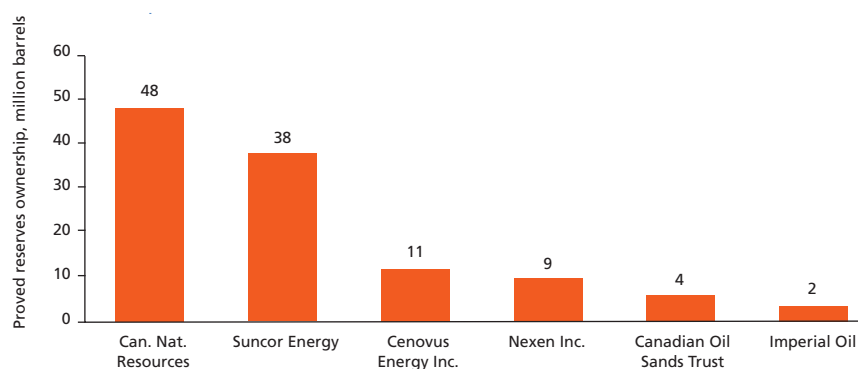
30 <http://www.co-operative.coop/Corporate/PDFs/Tar%20Sands%20CCS.pdf>.

31 Alberta Carbon Capture and Storage Development Council, Accelerating Carbon Capture and Storage Implementation in Alberta, March 2009, See http://www.energy.alberta.ca/Org/pdfs/CCS_Implementation.pdf, accessed April 19, 2010.

32 Farrell A.E., Brandt A.R., (2006), Risks of the oil transition, Environmental Research Letters, Vol. 1, No. 1.

33 Bramley, M., Partington, P.J., Sawyer, D., (2009), Linking National Cap-and-Trade Systems in North America, Clean Energy and Climate Action: A North American Collaboration, Draft Paper for Discussion, The Pembina Institute and International Institute for Sustainable Development, http://www.iisd.org/pdf/2009/linking_nat_cap_north_america.pdf, accessed March 2, 2010.

Chart 2: Consolidated fund ownership of oil sands proved reserves – top five companies



Source: Trucost Plc

Managing fund carbon risk related to oil sands projects

To address fund exposure to carbon risks related to oil sands projects, asset owners and fund managers could model potential risk-adjusted returns taking account of exposure to carbon constraints. They could also:

- Include climate change criteria for the energy sector in principles for proxy voting and engagement programs. These active ownership practices could be used to encourage companies to:
 - Disclose oil sands production and environmental data separately from conventional oil and gas data within regulatory and statutory filings
 - Disclose GHG intensity per barrel of oil equivalent produced in oil sands year on year
 - Clearly report the current and projected costs of compliance with GHG regulations, including carbon prices used to model potential future risk in investment appraisals
- Report on expected costs of CCS activities to 2020 and the likely ability to pass these on
- Incorporate exposure to carbon costs and carbon management strategies into investment decisions
- Provide information on the potential financial impacts of emissions standards, cap-and-trade programs and low-carbon procurement by downstream users
- Include financial risk from carbon constraints in a cost/benefit analysis comparing oil sands expansion with the development of less emissions-intensive fuel sources
- Collaborate with other institutional investors to address carbon risks from oil sands projects

6

Addressing carbon risk: Opportunities for asset owners and investment managers

Asset owners

Asset owners can reposition their investment frameworks to better address short- and long-term climate change risks. For example, asset owners can encourage their investment managers to integrate climate change considerations into investment processes by taking the following steps:

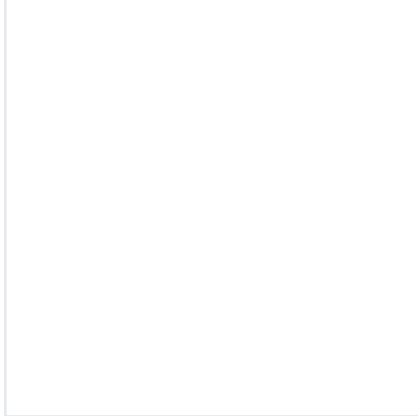
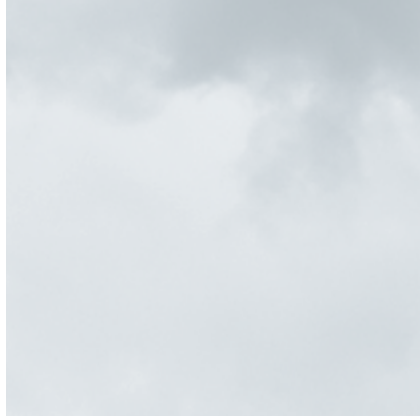
- Incorporate climate change criteria into Statements of Investment Policy and Procedures, and active ownership activities, such as proxy voting and engagement
- Include climate-related requirements for identifying potential carbon risks and opportunities and protecting the long-term value of the fund within Requests for Proposals for investment managers, consultants, advisors and Investment Management Agreements
- Require investment managers to report on how they are managing climate change risks
- Develop controls and strategies to ensure that investment decisions take account of relevant climate-related risks
- Incorporate climate change criteria into investment performance monitoring frameworks and ongoing evaluation of investment managers and consultants
- Monitor investment managers to ensure that they have adequate resources to exercise ownership rights on climate-related issues and that they review the outcomes of these activities
- Link reward structures to longer-term investment management performance

Your external investment managers are in the best position to monitor and proactively manage the portfolio's exposure to climate change-related risks and opportunities. To the right are some general and specific questions for your investment manager as well as some general activities for you or your investment manager to consider.

Questions for managers

You may want to consider discussing the following general questions with your investment managers to determine how they are addressing GHG-related risks, if at all:

1. Do you view corporate GHG emission performance and climate change strategy as potentially material to corporate stakeholders? Does this view vary by sector?
2. How do you measure GHG emissions and exposure to potential costs associated with these emissions in my portfolio and over what time horizons?
3. How do you analyze the impact of climate-related risks and opportunities on long-term portfolio risk and return?
4. How is climate change considered in related proxy voting decisions, and is it a topic of discussion during relevant meetings with companies?
5. What resources (such as internal specialists or external research firms) support the above, and are there any industry best practices you follow or look to?
6. Do you have a view on what GHG emission regulatory frameworks are likely to be imposed on Canadian businesses and in what timeframe?
7. Did you know that you can extract GHG emissions data from the Bloomberg Professional service?



If a carbon footprint analysis was conducted for your portfolio, you may want to consider discussing **specific** questions like these about your portfolio:

1. Are the results of this analysis informative?
Are they surprising?
2. Are you aware that the portfolio has a lower carbon footprint than the benchmark?
3. Are you aware that the primary reason for the lower footprint is sector allocation and not stock selection?
4. Does your sector allocation reflect your views on GHG-related risks for different sectors?
5. Are you aware that an investor has filed a shareholder resolution calling on Suncor to report to investors how the company includes the potential cost of carbon in its long-term business planning?³⁴
What process would you use to decide how to vote on this resolution if it is put to investors?

Following a discussion of the results with your manager, you may wish to discuss the following questions with him or her, exploring the question, **“Where do we go from here?”**

1. Having had the opportunity to review this analysis, do you believe your existing investment process accords you adequate information to manage carbon risk?
2. How do you expect your focus on analyzing and managing carbon risk to change or evolve going forward?
3. What additional resources (such as internal specialists or external research firms) might be required?

Checking on voting

Step 1

Gather your investment holdings as of the end of the year.

Step 2

Check SHARE's or Interfaith Center for Corporate Responsibility's website for upcoming carbon emission or climate change-related shareholder resolutions.

Step 3

Ask your voting agent how he or she voted in the past or how he or she plans to vote on these resolutions.

Step 4

Ask your manager to highlight, at least once a year, three different shareholder resolutions related to carbon emissions or climate change and to highlight how and why he or she voted on your behalf.

³⁴ For more information, see <http://www.share.ca/en/node/2168>.

Investment managers

There are several different approaches an investment manager can take to incorporate climate change-related risks and opportunities into the investment process.

In general, investment managers can:

- Conduct research in order to understand exposure to carbon costs
- Monitor GHG emissions and related exposure to carbon costs under existing and pending regulatory frameworks
- Develop processes to proactively manage emissions-related risks and opportunities in portfolios
- Integrate climate change criteria such as carbon performance into financial analysis, stock selection decisions and active ownership practices
- Support robust reporting requirements for companies to disclose GHG emissions, climate-related policies and potential risks to investors
- Invest in solutions such as renewable energy and energy-efficiency technologies
- Engage with carbon-intensive investee companies to encourage them to report emissions fully, disclose carbon costs, reduce emissions and develop effective strategies to manage climate risks and opportunities
- In line with above, support initiatives such as the Carbon Disclosure Project and the recent Investor Statement on Climate Risk³⁵

Managing the risks and opportunities associated with climate change and carbon emissions is an emerging practice. However, the approaches to the left furnish asset owners and managers with a variety of ways to take action. New tools are being developed, awareness is growing and more research into the impact of carbon management and overall emissions on company performance is emerging.

This leads us to a point in time when asset owners and the investment managers they hire need to become increasingly sophisticated in the way they consider, approach, measure and manage climate-related risks.

³⁵ For more information on the Carbon Disclosure Project, see www.cdproject.net. To read about the Investor Statement on Climate Risk, go to www.incr.com/Page.aspx?pid=1177, accessed Feb. 11, 2010.

7

Conclusion

WWF-Canada commissioned this study in order to identify the carbon exposure of Canadian institutional pooled investment products and raise awareness regarding its findings. Climate change and assessing carbon exposure are becoming important issues for institutional investors – both in terms of potential risk and opportunity. Moving toward quantifiable and comparable environmental data is the first step toward assessing climate change-related investment risks.

The difference between the portfolio and benchmark carbon exposure of a portfolio is a proxy for potential risk in so far as the greater the carbon in the portfolio compared to that in the benchmark, the higher the exposure to emission-related risks can be assumed. The findings show that stock selection and sector allocation contribute to carbon intensity in a portfolio, and asset owners and managers can take a number of positive actions to mitigate their exposure to carbon.

As public policy develops and if a quantifiable value is introduced for carbon emissions broadly, it is likely that investors will see changes to regulation, greater demand for assessment of physical impacts of company operations and an increase in litigation, competition and reputation impacts.

However, as noted in this report, further research is required to better address the full implications of climate change and associated carbon exposure for investors.



Glossary

Carbon dioxide equivalents

Carbon dioxide equivalents (or CO₂e) as used in this report, represent the greenhouse gases (GHGs) included in the Kyoto Protocol (see Greenhouse gases).

Carbon footprint

Tonnes of carbon dioxide equivalent emissions per USD1 million revenue.

Carbon footprint tilt

A measure of the significance of the difference in carbon intensity between the portfolio and the benchmark. Note that this is a measure of statistical significance, expressed as standard deviations from the mean of the benchmark. A positive tilt indicates that a portfolio has a higher carbon footprint than the benchmark and a negative tilt indicates that a portfolio has a lower carbon footprint.

Carbon intensity

See Carbon footprint.

Climate change

A change of climate that is attributed to natural or anthropogenic activity that alters the composition of the global atmosphere and changes weather patterns on a global scale. There is compelling evidence that increasing concentrations of GHGs in the atmosphere are attributable to human activity and are increasing the greenhouse effect and causing climate change.

Climate risks

The risks stemming from climate change that have the potential to affect companies, industries and whole economies. There are five key areas of business risk associated with climate change: regulatory, physical, litigation, competitiveness and reputational.

Greenhouse gases

The gases that contribute to the greenhouse effect and global warming. The gases are released into the atmosphere through the combustion of organic matter (including fossil fuels) and through natural processes. The Kyoto Protocol deals with the following GHGs: carbon dioxide, nitrous oxide, methane, sulphur hexafluoride, hydrofluorocarbons and perfluorocarbons.

Portfolio carbon footprint

The carbon footprint of a portfolio (and a benchmark) is the weighted average carbon footprints of the holdings in the portfolio. This is calculated by summing the investment weight of each holding by the holdings' carbon footprint.

Sector allocation effect

The effect of different sector weightings relative to the benchmark.

Stock selection effect

The effect of different stock selection and weighting within the sector.

B

Methodology

One of the steps investors can take to increase awareness of, and better manage, carbon risk is to monitor the carbon exposure in their portfolios. Some investors may wish to monitor this to be informed about an emerging risk factor, while others may monitor the exposure to help them to engage with fund managers on the topic.

The carbon footprint analysis in this report is part of a new analysis Mercer offers as a part of its monitoring capability. This initiative by Mercer's Responsible Investment team has been made possible by a partnership with an external environmental data provider, Trucost Plc, via the Style Research Portfolio Analyzer (SRPA).

To understand the carbon footprint of a portfolio and its carbon risk exposure, the asset owner needs to understand the risks to each of the individual companies in a fund. Trucost's analysis and emissions modelling provide the necessary carbon performance data on more than 4,500 publicly listed companies. Company carbon performance data are assigned to the portfolio in proportion to its weighting in the portfolio to calculate the carbon footprint of a fund. This exercise is repeated for the benchmark in order to compare and understand the portfolio's relative performance using StyleResearch's Skyline analysis.

Calculating a company's carbon footprint

To calculate a company's carbon footprint, Trucost analyzes a company's direct GHG emissions (Scope 1 of the GHG Protocol) and its first-tier (direct) supplier emissions (Scope 2 and Scope 3 of the GHG Protocol). A company's carbon inventory will thus include its direct emissions from fossil fuel combustion and relevant chemical processes and supply chain emissions from purchased electricity, business travel and logistics. All GHG emissions are adjusted for their global warming potential, that is, their ability to cause climate change, and are summed to a CO₂e value. So that companies can be compared regardless of size, industry or geography, a company's carbon emissions are normalized to its annual sales revenue. A company's carbon footprint is thus its tonnes of direct and first-tier supply chain CO₂e emissions per USD million sales revenue (tonnes of CO₂e/USD million sales).

Trucost analyzes all public GHG emissions disclosure from a company, such as its annual report, CSR/environmental report or other public disclosure. Trucost's analysts make efforts to ensure that any disclosed value covers a company's entire global operations internationally. Where the disclosed data are deemed insufficient, Trucost will standardize the value to make it comparable with the GHG protocol. Trucost contacts every company it analyzes to ask for feedback on its data; new or updated information will be entered into its database.

To be able to have data on an entire investment universe, Trucost has developed an environmental input-output model to estimate company emissions in the absence of disclosure. Trucost estimates company emissions where disclosure is partial or even absent. Trucost has carbon emission profiles for 464 different industry sectors. The emissions for each sector are allocated to a company according to the proportion of its revenues in each sub-sector.

For more detailed information on the Trucost methodology, please see www.trucost.com.

Measuring carbon footprint of a portfolio

The carbon footprint of a portfolio (and a benchmark) is the weighted average carbon footprints of the holdings in the portfolio. This is calculated by summing the investment weight of a holding by the holdings' carbon footprint. If a portfolio is weighted toward companies with lower carbon footprints, it will have a lower carbon footprint. Similarly, if the portfolio tilts toward more carbon intense companies, the portfolio will have a high carbon footprint reflective of its higher exposure to carbon.

Style research

Some of the charts used in this report have been created using data provided by StyleResearch Ltd. through SRPA, a portfolio style and analytics package. This package is used to analyze fund managers' portfolios, including style and risk characteristics based on a detailed examination of the portfolio composition.

For more information on SRPA, see www.styleresearch.com



About WWF-Canada

WWF-Canada

Our mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption. We focus our work on three areas: climate (Arctic, transportation, tar sands initiatives), water (freshwater and marine protection) and people (engaging consumers and companies to change their behaviours).

WWF-Canada has demonstrated success with its method of pursuing collaborative efforts to find solutions for a living planet. WWF-Canada works with partners in provincial and federal governments, Aboriginal communities and groups, non-governmental organizations, local communities, and industry and corporations. WWF-Canada's supporters include individuals, foundations, governments, corporations and other non-governmental organizations.

Climate Savers. WWF-Canada is working with leading companies eager to turn necessity into greater business advantages. WWF-Canada collaborates with major global business and industry leaders through the global Climate Savers program to establish ambitious targets to voluntarily and creatively reduce greenhouse gases.

By the end of 2010, our Climate Savers companies will collectively cut carbon emissions by some 14 million tonnes annually – the equivalent of taking more than 3 million cars off the road every year. By increasing efficiency, Climate Savers companies also save hundreds of millions of dollars – proving that protecting the environment really does make smart business sense!

There are enormous opportunities for businesses to improve their standing and bottom line by cutting CO₂ emissions. WWF-Canada firmly believes these actions are entirely compatible with improving shareholder and stakeholder values.

Mercer's Investment Consulting business

Mercer is a leading global provider of consulting, outsourcing and investment services, with more than 25,000 clients worldwide. Mercer consultants help clients design and manage health, retirement, and other benefits and optimize human capital. The firm also provides customized administration, technology and total benefit outsourcing solutions. Mercer's investment services include global leadership in investment consulting and multimanager investment management.

Mercer's global network of more than 19,000 employees, based in over 40 countries, helps ensure integrated, worldwide solutions. Our consultants work with clients to develop solutions that address global and country-specific challenges and opportunities. Mercer is experienced in assisting both major and growing midsize companies.

Mercer investment consulting is a leading global provider of investment consulting services and offers customized guidance at every stage of the investment decision, risk management and investment monitoring process. We have been dedicated to meeting the needs of clients for more than 30 years, and we work with the fiduciaries of pension funds, foundations, endowments and other investors in some 35 countries. We assist with every aspect of institutional investing (and retail portfolios in some geographies), from strategy, structure and implementation to ongoing portfolio management. We create value through our commitment to thought leadership; world-class, independent research; and top-notch consultants with local expertise.

The company is a wholly owned subsidiary of Marsh & McLennan Companies, Inc., which lists its stock (ticker symbol: MMC) on the New York, Chicago and London stock exchanges.

For more information, please visit www.mercer.com

Trucost

Trucost was established in 2000, to help organizations, investors and governments understand and quantify the environmental impacts of business activities.

Over the past 10 years Trucost has collected, researched and validated environmental data from organizations across the world. The result is the world's most comprehensive data on corporate environmental impacts, covering greenhouse gases (GHGs), water, waste, metals and chemicals.

This enables our clients to access:

- The most efficient approach to measuring GHG emissions and wider environmental impacts across organizations, supply chains and investment portfolios
- Clear identification of priority areas for reducing environmental impacts
- Validation of source data, including completion of gaps in data which are not currently being tracked or reported on
- Comparison of environmental performance against peers, sectors and investment benchmarks
- The ability to create environmentally oriented investment products

For more information, visit www.trucost.com

Mercer

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- The value of bonds and other fixed income investments, including unit trusts, can go down as well as up, and you may not get back the amount you have invested.
- Investments denominated in a foreign currency will fluctuate with the value of the currency.

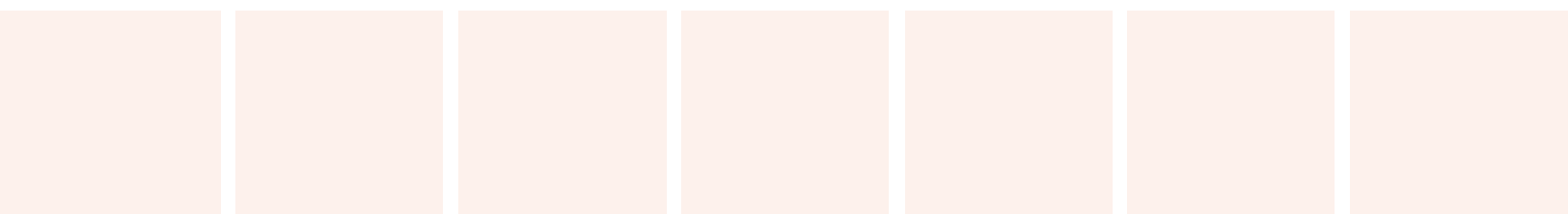
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