Welcome to your CDP Climate Change Questionnaire 2020

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

Manulife Financial Corporation (Manulife) is a leading international financial services group that helps people make their decisions easier and lives better. We operate primarily as John Hancock in the United States and Manulife elsewhere. We provide financial advice, insurance, as well as wealth and asset management solutions for individuals, groups and institutions. At the end of 2019, we had more than 35,000 employees, over 98,000 agents, and thousands of distribution partners, serving almost 30 million customers. As of December 31, 2019, we had $1.2 trillion (US$0.9 trillion) in assets under management and administration, and in the previous 12 months, we made $29.7 billion in payments to our customers. Our principal operations in Asia, Canada and the United States are where we have served customers for more than 100 years. With our global headquarters in Toronto, Canada, we trade as 'MFC' on the Toronto, New York, and the Philippine stock exchanges and under '945' in Hong Kong.

Effective January 1, 2018, the Company introduced Global Wealth and Asset Management as a primary reporting Segment in addition to existing the Segments of Asia, Canada and the United States. This change reflected organizational changes made to drive better alignment with our strategic priorities as well as to increase focus and leverage scale in our global wealth and asset management businesses. Our reporting elements in this submission for the Global Wealth and Asset Management Segment are:

- Manulife Investment Management is the unified global brand for Manulife’s Global Wealth and Asset Management (GWAM) segment, which serves individual investor and institutional clients in three businesses: Retirement, Retail, and Institutional Asset Management (Public Markets and Private Markets). For the purposes of this submission, two businesses within Manulife Investment Management we would like to highlight are the following:
  - Agriculture and timber businesses also known as Hancock Natural Resource Group (HNRG): Our agriculture and timber businesses specialize in global farmland and timberland portfolio development and management. Assets are managed on behalf of our clients through the Hancock Agricultural Investment Group (HAIG) and the Hancock Timber Resource Group (HTRG). Investments are integrated with comprehensive property management operations. We manage over 5.4 million acres of timberland and nearly 470,000 acres of farmland globally, with approximately US$14.1 billion in assets under management.
  - Real Estate: our Real Estate portfolio consists of space that is occupied both by external tenants and by Manulife corporate users. Most of our assets are managed by our robust team of real estate professionals. We do not include...
data from properties that are managed by third-party property management firms in our reporting, as we do not have operational control over these buildings.

Another part of Manulife we will be highlighting in this submission is our General Fund which supports the operations of our Asia, Canada and United States Segments. Our investment philosophy for the General Fund is to invest in an asset mix that optimizes our risk adjusted returns and matches the characteristics of our underlying liabilities. We follow a bottom up approach which combines our strong asset management skills with an in-depth understanding of the characteristics of each investment. We invest in a diversified mix of assets, including a variety of alternative long-duration asset classes. Our diversification strategy has historically produced superior risk adjusted returns while reducing overall risk. We use a disciplined approach across all asset classes, and we do not chase yield in the riskier end of the fixed income or alternative asset market. As part of our well-diversified investment program, we are a market leader in financing renewable energy and energy efficiency projects. Our Infrastructure investment teams include renewable energy financing specialists that invest Manulife’s on-balance-sheet assets into wind, solar, hydroelectric, geothermal, and waste-to-energy projects, as well as in energy efficiency installations that allow our borrowers to reduce their energy use. Since 2002, Manulife has invested CAD $14.8 billion in renewable energy and energy efficiency projects.

Under General Fund, our Oil and gas company NAL Resources Limited is one of Manulife’s wholly owned subsidiaries. All of NAL’s assets are located in western Canada.

Corporate and Other: comprised of investment performance on assets backing capital, net of amounts allocated to operating segments; financial costs; costs incurred by the corporate office related to shareholder activities (not allocated to operating segments); our Property and Casualty (P&C) Reinsurance business; and run-off reinsurance business lines.

All data provided is for 2019 and in Canadian dollars, unless otherwise stated.

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

<table>
<thead>
<tr>
<th>Reporting year</th>
<th>Start date</th>
<th>End date</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 1, 2019</td>
<td>December 31, 2019</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C0.3

(C0.3) Select the countries/areas for which you will be supplying data.

- Australia
- Bermuda
- Cambodia
- Canada
Chile  
China  
China, Hong Kong Special Administrative Region  
Indonesia  
Ireland  
Japan  
Malaysia  
New Zealand  
Philippines  
Singapore  
Taiwan, Greater China  
Thailand  
United Kingdom of Great Britain and Northern Ireland  
United States of America  
Viet Nam

**C0.4**

(C0.4) Select the currency used for all financial information disclosed throughout your response.  
CAD

**C0.5**

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.  
Operational control

**C-FS0.7**

(C-FS0.7) Which organizational activities does your organization undertake?  
Investing (Asset manager)  
Investing (Asset owner)  
Insurance underwriting (Insurance company)

**C1. Governance**

**C1.1**

(C1.1) Is there board-level oversight of climate-related issues within your organization?  
Yes
C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

<table>
<thead>
<tr>
<th>Position of individual(s)</th>
<th>Please explain</th>
</tr>
</thead>
</table>
| Board-level committee     | Oversight of our environmental, social and governance framework is included in the charter of the Corporate Governance and Nominating Committee of the Board of Directors. The committee reviews Manulife’s sustainability strategy progression and stays informed of Environmental, Social, and Governance (ESG) trends, risks and opportunities through management reporting. Members of the Corporate Governance and Nominating Committee include the Board Chair and 6 independent Board members. Examples of climate-related matters considered by this committee in 2019 include:
  - Reviewed our Sustainability Strategy
  - Reviewed and approved our Climate Change position Statement and TCFD disclosure |

C1.1b

(C1.1b) Provide further details on the board’s oversight of climate-related issues.

<table>
<thead>
<tr>
<th>Frequency with which climate-related issues are a scheduled agenda item</th>
<th>Governance mechanisms into which climate-related issues are integrated</th>
<th>Scope of board-level oversight</th>
<th>Please explain</th>
</tr>
</thead>
</table>
| Scheduled – all meetings                                               | Reviewing and guiding strategy
  Reviewing and guiding major plans of action
  Reviewing and guiding risk management policies                         | Climate-related risks and opportunities to our own operations
  Climate-related risks and opportunities to our investment activities
  Climate-related risks and opportunities to our insurance underwriting activities | Oversight of our environmental, social and governance (ESG) framework is included in the charter of the Board’s Corporate Governance and Nominating Committee (the Committee). The Committee reviews progress made on our sustainability strategy and stays informed of ESG trends, risks and opportunities through management reporting. Members of the Committee include the Board Chair and five independent Board members. |
### The impact of our own operations on the climate
- The impact of our investing activities on the climate
- The impact of our insurance underwriting activities on the climate

### C1.2

**C1.2** Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

<table>
<thead>
<tr>
<th>Name of the position(s) and/or committee(s)</th>
<th>Reporting line</th>
<th>Responsibility</th>
<th>Coverage of responsibility</th>
<th>Frequency of reporting to the board on climate-related issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chief Executive Officer (CEO)</td>
<td>Reports to the board directly</td>
<td>Assessing climate-related risks and opportunities</td>
<td>Risks and opportunities related to our bank lending activities, Risks and opportunities related to our investing activities, Risks and opportunities related to our insurance underwriting activities, Risks and opportunities related to our other products and services</td>
<td>More frequently than quarterly</td>
</tr>
<tr>
<td>Role</td>
<td>CEO Reporting Line</td>
<td>Risks and Opportunities</td>
<td>Frequency</td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
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<td>--------------------------</td>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>Chief Financial Officer (CFO)</td>
<td>Both assessing and managing climate-related risks and opportunities</td>
<td>Risks and opportunities related to our own operations</td>
<td>More frequently than quarterly</td>
<td></td>
</tr>
<tr>
<td>Chief Risks Officer (CRO)</td>
<td>Both assessing and managing climate-related risks and opportunities</td>
<td>Risks and opportunities related to our own operations</td>
<td>More frequently than quarterly</td>
<td></td>
</tr>
<tr>
<td>Risks and opportunities related to our underwriting activities</td>
<td>Risks and opportunities related to our other products and services</td>
<td>More frequently than quarterly</td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Chief Operating Officer (COO)</td>
<td>Both assessing and managing climate-related risks and opportunities</td>
<td>Risks and opportunities related to our own operations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEO reporting line</td>
<td></td>
<td>More frequently than quarterly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other, please specify Executive Sustainability Council (ESC): Members are: Chief Financial Officer, Chief Risk Officer, Chief Investment Officer, General Counsel, Chief Analytics Officer, President and CEO of Global Wealth and Asset Management, Chief Marketing Officer</td>
<td>Other, please specify Both assessing and managing climate-related risks and opportunities. (1) Sets Manulife’s sustainability ambition and strategy, (2) Acts as recommendation body on strategy and significant issues to Executive Leadership Team, including the CEO</td>
<td>Risks and opportunities related to our bank lending activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEO reporting line</td>
<td></td>
<td>More frequently than quarterly</td>
<td></td>
<td></td>
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<tr>
<td>Other, please specify</td>
<td></td>
<td>Risks and opportunities related to our insurance activities</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Risks and opportunities related to our other products and services</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Risks and opportunities related to our investing activities</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

Matters related to climate change is a component of Manulife’s ESG framework, overseen by the Corporate Governance and Nominating Committee of the Board (CGNC). Climate-related risks and opportunities are also considered by the Board’s Risk Committee through the ongoing monitoring and reporting of emerging risks.

The CGNC reviews progress made on our sustainability strategy and stays informed of ESG trends, risks and opportunities through management reporting. The Chair of the CGNC reports to the full Board on matters discussed at committee meetings. Members of the CGNC include the Board Chair and six independent Board members. The CGNC’s oversight of the company’s ESG framework complements the work of the Executive Sustainability Council (ESC). The ESC, which consists of nine members of our Executive Leadership Team (ELT), is responsible for establishing the enterprise’s sustainability ambition, guiding the development and execution of the sustainability strategy and providing recommendations and direction on matters related to sustainability to our Executive Leadership Team. In addition to the ESC, we have a subsidiary-specific committee that executes asset class specific sustainability objectives.

To operationalize our governance model, we established a Sustainability Centre of Expertise (CoE) in 2018. The CoE consists of corporate function and business unit sustainability leads tasked with integrating sustainability into our business practices. This group’s responsibilities include:

• Leading development and implementation of sustainability strategy
• Ensuring integration of sustainability into business unit strategies, policies and procedures
• Advising on sustainability matters and providing support and capacity building to business units

In 2019 we also established a Climate Change Working Group (CCWG), chaired by our Chief Risk Officer. This working group is responsible for developing our approach to climate change. The Climate Change Working Group escalates climate, and more broadly, environmental risks to the ESC, of which our Chief Risk Officer is also a member. In addition to issue-specific reporting, the management of climate change is captured in our Enterprise Risk Management (ERM) Evolving Risk Inventory, which is reported to the Board’s Risk Committee. In 2019, through the work of the Climate Change Working Group, and with support and approval of the Executive Sustainability Council, Manulife released a Climate Change Position statement, outlining our approach to climate change. For clarity, however, note that the Corporate Governance and Nominating Committee of the Board has oversight of ESG matters.

Manulife Investment Management has established a governance structure to oversee its teams’ sustainable and responsible investing and activities. The structure is comprised of two committees that ensure oversight and decision-making at the appropriate levels:
Manulife Financial Corp. CDP Climate Change Questionnaire 2020 Wednesday, August 26, 2020

Public Markets Sustainable Investing Committee and Private Markets Sustainable Investing Committee.

Manulife Investment Management, Real Estate arm: Sustainability topics, including issues related to climate, are overseen by the Real Estate Executive Sustainability Steering Committee, which is chaired by Manulife Investment Management’s Global Head of Real Estate Asset Management and consists of senior real estate executives from key departments and regions. The Committee oversees progress toward achieving our sustainability vision and ensures we meet our commitments and adhere to corporate policies and practices and meets quarterly to discuss sustainability strategy, sustainability program advancement and portfolio performance. Strategy and performance relating to climate change risks and opportunities are addressed through analysis of greenhouse gas emissions, greenhouse gas reduction targets, renewable energy strategy and performance and performance in industry ESG benchmarking initiatives including GRESB.

Manulife Investment Management’s Agriculture and Timber group: Accountability for Sustainability and Responsible Investing (SRI) lies with the Agriculture and Timber group’s Executive Team, the most senior decision-making body in the company. Our Chief Sustainability Officer oversees implementation of SRI in matters of investment, operations, and policy, and SRI issues are further informed by sustainability working groups within Manulife Investment Management and Manulife.

NAL Resources: NAL has initiated several core business strategies including a Carbon Footprint Reduction strategy with associated targets and goals. This strategy is sponsored by our VP, Financial and Information Services. Key committees that monitor climate-related issues include NAL Executive, NAL’s Board of Directors and Health, Safety, and Environment Committee.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

<table>
<thead>
<tr>
<th>Provide incentives for the management of climate-related issues</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Monetary incentives are provided for the management of climate-related issues in our Manulife Investment Management Real Estate arm.</td>
</tr>
</tbody>
</table>

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

<table>
<thead>
<tr>
<th>Entitled to incentive</th>
<th>Type of incentive</th>
<th>Activity incentivized</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>
C-FS1.4

(C-FS1.4) Does your organization offer its employees an employment-based retirement scheme that incorporates ESG principles, including climate change?

<table>
<thead>
<tr>
<th>Row</th>
<th>Monetary reward</th>
<th>Energy reduction target</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Other (please specify)</td>
<td>Water and waste reduction targets</td>
<td>Manulife has a robust pension governance model which includes oversight Committees comprised of plan fiduciaries that routinely select and monitor the investment options available to plan members in company-sponsored defined contribution (DC) plans. DC investment options made available to members are intended to be sufficiently diversified, avoid excessive risk, and provide strong risk-adjusted long-term returns. Investment options are not evaluated on any single criteria, but include a myriad of factors, including social, environmental or ethical policies. Fund managers of the DC investment options take ESG considerations into account when selecting investments to the extent that it is expected to improve their risk-adjusted returns.</td>
</tr>
</tbody>
</table>

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes
C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

<table>
<thead>
<tr>
<th></th>
<th>From (years)</th>
<th>To (years)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short-term</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Medium-term</td>
<td>3</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Long-term</td>
<td>15</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

Manulife considers a climate-related risk and opportunities to be financially substantive if it has a negative impact on our financial position or our ability to operate. These impacts may be direct or indirect and may include business losses or disruption resulting from extreme weather conditions; the impact of changes in legal or regulatory framework made to address climate change; or increased mortality or morbidity resulting from environmental damage or climate change. We also include the impact on the value of owned assets of all these factors particularly weather events and transition to a low carbon economy.

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered

Direct operations

Risk management process

Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment

More than once a year

Time horizon(s) covered

Short-term
Medium-term
Long-term

Description of process

Our definition of climate-related risk is aligned with the TCFD definition and is the risk of loss and/or reputational damage resulting from the inability to adequately plan for the
impacts of climate change or the transition to a lower-carbon economy through mechanisms, such as industry regulations, government interventions, and shifts in consumer preferences. We view climate-related risk as a type of strategic risk, since climate change impacts can manifest themselves through any of our existing principal risks.

In 2019, Global Risk Management initiated the review of key policies and standards to enhance the integration of climate-related risk taking activities into the ERM framework to ensure that they are managed in a manner consistent with our common approach to risk management (refer to section “e – Risk Identification, Measurement and Assessment” above). This review included procedures, protocols and due diligence standards of business and functional units that invest and manage real assets, such as Manulife Investment Management’s (“MIM”) real estate arm, NAL Resources, and Hancock Natural Resource Group.

Some examples of our climate-related risk management activities include monitoring industry and regulatory developments and engaging with investee companies to encourage better disclosures. For example, Manulife Investment Management’s public markets team engages some of the world’s largest emitters on climate-related risks and opportunities as part of the collaborative industry program Climate Action 100+. In addition, there is a Manulife Investment Management Responsible Investing approach that integrates ESG considerations and the General Account has a set of ESG guidelines that seek to do the same for the assets we own.

As sustainability is integrated into our business operations, Manulife introduced in 2018 the Sustainability Centre of Expertise - made up of Head Office Leads, Business Unit Sustainability Leads and other key internal stakeholders. This group meets once a month and responsibilities include the Identification of risks and opportunities related to sustainability and climate change. When a risk is identified, and is material, it is escalated to the Executive Sustainability Council.

Corporate: Manulife considers a climate-related risk and opportunities to be financially substantive if it has a negative impact on our financial position or our ability to operate. These impacts may be direct or indirect and may include business losses or disruption resulting from extreme weather conditions; the impact of changes in legal or regulatory framework made to address climate change; or increased mortality or morbidity resulting from environmental damage or climate change.

Management of material climate-related issues for our real assets is carried out at the Business Unit (BU) level. Systems for risk identification, assessment and management are built into existing policies and procedures and are specific to the asset (e.g. oil and gas, real estate, forestry, agriculture etc.). BU Sustainability leads report on environmental issues, including issues related to climate change. The Climate Change Working group launched in 2019 as a sub-team of the Sustainability Centre of Expertise and sponsored by the CRO, is responsible for working with BU Sustainability leads to set, measure and report on Manulife’s environmental KPIs and indicators. The working
group performs an assessment and reports to the Executive Sustainability Council (ESC), which includes the CRO, any material environmental issues, which would be reported to the Board’s Risk Committee and/or Corporate Governance & Nominating Committee through consolidated reporting. The management of climate change is captured in ERM’s Evolving Risk Inventory and reported to the Board’s Risk Committee at least twice a year. ERM scans for trends/insights via industry publications and other channels and disseminates any relevant information to BUs and other internal stakeholder as required. The Corporate Sustainability team does the same and acts as a resource to BU Sustainability leads in their development of processes related to climate management.

Examples:
Manulife Investment Management’s Real Estate arm: Real Estate considers climate and natural hazard risks during its acquisition due diligence process. 3rd party consultants perform building assessments and rely on local studies and guidelines where available. Environmental assessments, building status reports and insurance renewals are conducted periodically depending on the risk profile of a property. The Engineering and Technical Services team assesses portfolio-level CC risks and opportunities and tracks and benchmarks energy and GHG emissions. As building owners and managers, we minimize our environmental footprint by systematically investing in resource efficiency and embedding conservation practices throughout our operations. In our investment practices, we list sustainability issues and risks that must be considered in due diligence checklists. A “Sustainability in Investment and Due Diligence Summary Form” is completed for all investments, is signed off on by the investment manager and is provided as part of the investment package. This form specifically asks if there are any climate related risks identified during the due diligence process. We have set five-year targets for energy, water and waste and a long-term greenhouse gas emissions target for 2022 that aligns with national and international greenhouse gas emission reduction commitments. We report our progress to investors and other stakeholders through our Real Estate Sustainability Report, the annual GRESB for each fund and the PRI Direct Property Investing module.

Manulife Investment Management’s Agriculture and Timber group: Climate risk is assessed as part of the due diligence process for new acquisitions, where future water availability, fire and pest risk (among other issues) and carbon market opportunities are identified. One identified physical risk is chronic risks associated with changes in precipitation patterns and extreme variability in weather patterns. Our investment goal is to build diversified investment portfolios that are likely to reduce risks over the life of the asset. Process-wise, the Agriculture and Timber group’s CFO uses quarterly risk registry updates to assess climate-related risks and opportunities; whereas the Agriculture and Timber group’s COO uses those registries to manage related risks.

NAL: Using the AS.NZ4360:2004 framework, we identify, analyze, mitigate and monitor risks across risk categories. The categories include financial, operational, legal/regulatory, human resources and reputational risks.
Risks are evaluated on the consequence and likelihood of the risk occurring, within a 1 yr. and 5 yr. time frame, and then are prioritized utilizing a risk assessment matrix. Identified risks are monitored and reported on a quarterly basis.

C2.2a

(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

<table>
<thead>
<tr>
<th>Current regulation</th>
<th>Relevance &amp; inclusion</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Relevant, always included</td>
<td>Failure to adequately prepare for the potential realities of climate change may have a negative impact on our financial position and/or our ability to operate. Climate change risks include transition risks, such as potential positive and negative impacts of climate-related litigation, technological change, and environmental regulatory regimes; and physical risks, such as disruption resulting from extreme weather conditions or increased mortality or morbidity. MFC’s internal policies and guidelines provide enterprise-wide protocols for managing environmental risks, including climate change. Business and functional units are responsible for observing protocols and exercising due diligence to identify and manage environmental risks in accordance with these policies. Examples: Corporate level: The Manulife Sustainability Centre of Expertise works in tandem with Regulatory and Public Affairs group to monitor emerging regulations and cascades through the organization as appropriate. Manulife’s Legal and Compliance function is responsible for monitoring compliance with current regulations. BU level: Business unit Sustainability leads are responsible for monitoring regulatory changes in their sectors. For example: The Manulife Investment Management real estate arm complies with local energy benchmarking and mandatory greenhouse gas, energy and water reporting requirements in jurisdictions that we own assets.</td>
</tr>
<tr>
<td>Emerging regulation</td>
<td>Relevant, always included</td>
<td>Failure to adequately prepare for the potential realities of climate change may have a negative impact on our financial position and/or our ability to operate. Climate change risks include transition risks, such as potential positive and negative impacts of climate-related litigation, technological change, and environmental regulatory regimes;</td>
</tr>
</tbody>
</table>
and physical risks, such as disruption resulting from extreme weather conditions or increased mortality or morbidity. MFC’s internal policies and guidelines provide enterprise-wide protocols for managing environmental risks, including climate change. Business and functional units are responsible for observing protocols and exercising due diligence to identify and manage environmental risks in accordance with these policies.

Examples:

Corporate level: The Centre of Expertise works in tandem with Regulatory and Public Affairs group to monitor emerging regulations and cascades through the organization as appropriate. BU level: Business unit Sustainability leads are responsible for monitoring regulatory changes in their sectors.

Manulife Investment Management’s Agriculture and Timber group closely monitors carbon regulation and markets to be prepared to offer solutions to investors in the event of increased or more widespread carbon prices. In 2019 we began publicly reporting our GHG emissions and removals.

<table>
<thead>
<tr>
<th>Technology</th>
<th>Relevant, always included</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Failure to adequately prepare for the potential realities of climate change may have a negative impact on our financial position and/or our ability to operate. Climate change risks include transition risks, such as potential positive and negative impacts of climate-related litigation, technological change, and environmental regulatory regimes; and physical risks, such as disruption resulting from extreme weather conditions or increased mortality or morbidity. MFC’s internal policies and guidelines provide enterprise-wide protocols for managing environmental risks, including climate change. Business and functional units are responsible for observing protocols and exercising due diligence to identify and manage environmental risks in accordance with these policies.</td>
</tr>
</tbody>
</table>

Examples:

Manulife Corporate and our business units are always assessing the risks associated with new technologies in the market. Examples include in our utilities investment team considers disruptive technologies that may impact energy delivery, e.g. advances in the electric vehicle infrastructure.

Another example is NAL Resources is always assessing technological solutions for lower emissions and the costs associated with
Example 1, our utilities investment team considers disruptive technologies that may impact energy delivery, e.g. advances in the electric vehicle infrastructure, etc. Example 2, NAL assess technological solutions for lowering emissions and the costs associated with implementing these technologies as compliance costs rise.

| Legal          | Relevant, always included | Failure to adequately prepare for the potential realities of climate change may have a negative impact on our financial position and/or our ability to operate. Climate change risks include transition risks, such as potential positive and negative impacts of climate-related litigation, technological change, and environmental regulatory regimes; and physical risks, such as disruption resulting from extreme weather conditions or increased mortality or morbidity. MFC’s internal policies and guidelines provide enterprise-wide protocols for managing environmental risks, including climate change. Business and functional units are responsible for observing protocols and exercising due diligence to identify and manage environmental risks in accordance with these policies.  
Examples:  
We consistently monitor the potential of legal actions or shareholder proposals/resolutions regarding our management of climate change risks. |
| Market        | Relevant, sometimes included | Failure to adequately prepare for the potential realities of climate change may have a negative impact on our financial position and/or our ability to operate. Climate change risks include transition risks, such as potential positive and negative impacts of climate-related litigation, technological change, and environmental regulatory regimes; and physical risks, such as disruption resulting from extreme weather conditions or increased mortality or morbidity. MFC’s internal policies and guidelines provide enterprise-wide protocols for managing environmental risks, including climate change. Business and functional units are responsible for observing protocols and exercising due diligence to identify and manage environmental risks in accordance with these policies.  
Examples:  
Manulife Investment Management’s real estate group has a Sustainable Real Estate Framework to supplement the Manulife Investment Management’s Sustainable Investing Statement. We integrate ESG considerations into investment and due diligence practices to identify and manage risks and opportunities. We also integrate ESG considerations into our ongoing portfolio and asset management. |
management practices. We track and report on ESG integration in our portfolio. We promote responsible investing in the real estate industry through participation in industry initiatives such as the Global Real Estate Sustainability Benchmark (GRESB) Assessment.

Within real estate there is an increasing investor and customer demand for sustainable and energy efficient properties. We are at risk of tenants going elsewhere if we do not address these demands.

Reputation Relevant, always included

Failure to adequately prepare for the potential realities of climate change may have a negative impact on our financial position and/or our ability to operate. Climate change risks include transition risks, such as potential positive and negative impacts of climate-related litigation, technological change, and environmental regulatory regimes; and physical risks, such as disruption resulting from extreme weather conditions or increased mortality or morbidity. MFC’s internal policies and guidelines provide enterprise-wide protocols for managing environmental risks, including climate change. Business and functional units are responsible for observing protocols and exercising due diligence to identify and manage environmental risks in accordance with these policies.

Financial institutions such as Manulife, are expected by stakeholders to demonstrate their commitment to the transition to a low-carbon economy. The Manulife Executive Sustainability Council and Sustainability Centre of Expertise works in tandem with our Investor Relations, Brand Marketing, Regulatory and Public Affairs groups to monitor emerging reputational risks associated with such sustainability factors.

Examples:

Manulife Investment Management’s Agriculture and Timber group example 1: In 2019, the Agriculture and Timber group’s Executive Team adopted a formal zero-deforestation policy, committing not to clear native forests or acquire any land on which native forests have been cleared since regional cut-off dates agreed upon by international best practices.

Manulife Investment Management’s Agriculture and Timber group example 2: In 2019, after two years of working collaboratively with many of our colleagues throughout the agriculture sector, we have developed a performance-based, industry-wide sustainability standard and third-party certification program for agriculture, known as Leading Harvest. We are committed to enrolling eligible properties in the program, which includes in its principles energy efficiency and emissions reductions.
| Acute physical | Relevant, always included | Failure to adequately prepare for the potential realities of climate change may have a negative impact on our financial position and/or our ability to operate. Climate change risks include transition risks, such as potential positive and negative impacts of climate-related litigation, technological change, and environmental regulatory regimes; and physical risks, such as disruption resulting from extreme weather conditions or increased mortality or morbidity. MFC’s internal policies and guidelines provide enterprise-wide protocols for managing environmental risks, including climate change. Business and functional units are responsible for observing protocols and exercising due diligence to identify and manage environmental risks in accordance with these policies.

Examples:
Corporate level: An acute physical risk for Manulife is business disruption due to severe weather events that may translate into the mortality risk, operational disruption, or devaluation of impacted invested assets, for example coastal real estate. Manulife has business continuity policies, plans and procedures in place that take into account the risk of business disruption due to severe weather events.

Manulife Investment Management’s Real Estate group: Relevant, always included. Manulife Investment Management’s real estate group assesses natural hazards as part of its due diligence process, physical risk is included in insurance reports including natural hazards, environmental reports, e.g. floodplain maps, wind hazards, soil contamination.

Manulife Investment Management’s Agriculture and Timber group considers wildfire risk in its timberland acquisition due diligence. |
| Chronic physical | Relevant, always included | Failure to adequately prepare for the potential realities of climate change may have a negative impact on our financial position and/or our ability to operate. Climate change risks include transition risks, such as potential positive and negative impacts of climate-related litigation, technological change, and environmental regulatory regimes; and physical risks, such as disruption resulting from extreme weather conditions or increased mortality or morbidity. MFC’s internal policies and guidelines provide enterprise-wide protocols for managing environmental risks, including climate change. Business and functional units are responsible for observing protocols and exercising due diligence to identify and manage environmental risks in accordance with these policies.

Examples:
As part of the Manulife Investment Management’s Agriculture and |
Timber group’s risk assessments, the impact and management of chronic physical conditions such as drought and water scarcity are built into investment due diligence and operational procedures. In 2019, we conducted additional water scarcity due diligence on multiple acquisition targets.

Manulife Investment Management’s Real Estate group: Relevant, always included. Manulife Investment Management’s real estate group assesses natural hazards as part of its due diligence process, physical risk is included in insurance reports including natural hazards, environmental reports, e.g. floodplain maps, wind hazards.

**C-FS2.2b**

(C-FS2.2b) Do you assess your portfolio's exposure to climate-related risks and opportunities?

<table>
<thead>
<tr>
<th>We assess the portfolio's exposure</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investing (Asset manager) Yes</td>
<td>We may take a variety of actions towards managing climate-related risks and opportunities across our businesses and investments to appropriately price climate risk. Broadly summarized, our available actions relate to asset allocation and selection, investment analysis and research, proxy voting, mitigating direct GHG emissions, deploying best in class sustainability management practices for operated assets, and participating in collaborative industry climate initiatives. While we reserve the right to divest of any investment, our preferred position is company engagement to encourage climate risk mitigation and adaptation strategies.</td>
</tr>
<tr>
<td>Investing (Asset owner) Yes</td>
<td>We assess our portfolio's exposure to climate-related risks and opportunities for certain sectors only.</td>
</tr>
<tr>
<td>Insurance underwriting (Insurance company) Yes</td>
<td>We assess our portfolio’s exposure to climate-related risks and opportunities through the Underwriting Climate Change Working Group which was formed late 2019 to look at incorporating climate into their risk framework.</td>
</tr>
<tr>
<td>Other products and services, please specify</td>
<td></td>
</tr>
</tbody>
</table>
**C-FS2.2c**

(C-FS2.2c) Describe how you assess your portfolio’s exposure to climate-related risks and opportunities.

<table>
<thead>
<tr>
<th>Portfolio coverage</th>
<th>Assessment type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investing (Asset manager)</td>
<td>Minority of the portfolio</td>
<td>Qualitative and quantitative</td>
</tr>
<tr>
<td>Investing (Asset owner)</td>
<td>Majority of the portfolio</td>
<td>Quantitative</td>
</tr>
<tr>
<td>Insurance underwriting (Insurance company)</td>
<td>Unknown</td>
<td>Qualitative and quantitative</td>
</tr>
</tbody>
</table>

**C-FS2.2d**

(C-FS2.2d) Do you assess your portfolio’s exposure to water-related risks and opportunities?

<table>
<thead>
<tr>
<th>We assess the portfolio’s exposure</th>
<th>Portfolio coverage</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investing (Asset manager)</td>
<td>Yes</td>
<td>Minority of the portfolio</td>
</tr>
<tr>
<td></td>
<td></td>
<td>We are committed to responsible investing and sustainable management of our assets. Manulife’s commitment to environmental, social and governance integration and sustainable investment practices are outlined in Manulife Investment Management Sustainable Investment Statement, Real Estate Sustainability Framework, and Timber and Agriculture Sustainability and Responsible Investing (SRI) Framework.</td>
</tr>
</tbody>
</table>
Manulife Investment Management incorporates evaluation of ESG risks and opportunities in the investment and due diligence process. ESG considerations in the real estate investment process include, but are not limited to: transportation, building safety and materials, contamination, indoor environmental quality, regulatory compliance, flooding, natural hazards, climate change risks, energy efficiency, energy supply, water efficiency, waste management, water supply, tenant engagement programs, and green leasing.

We are committed to watershed protection in the operation of timber and agriculture assets. Protecting and improving watersheds is vital for the ecosystems and communities that depend on them. We do this by protecting sensitive lands, adhering to strict water and land management policies and best practices, and supporting forest growth.

<table>
<thead>
<tr>
<th>Investing (Asset owner)</th>
<th>Yes</th>
<th>Minority of the portfolio</th>
<th>Manulife will assess water related risks and opportunities if it is a material risk.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insurance underwriting (Insurance company)</td>
<td>Yes</td>
<td>Unknown</td>
<td>The process of assessing the portfolio’s exposure to water-related risks and opportunities just began in late 2019. The team is looking at developing a process.</td>
</tr>
<tr>
<td>Other products and services, please specify</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**C-FS2.2e**

*(C-FS2.2e) Do you assess your portfolio’s exposure to forests-related risks and opportunities?*

<table>
<thead>
<tr>
<th>We assess the portfolio’s exposure</th>
<th>Portfolio coverage</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investing (Asset manager)</td>
<td>Yes</td>
<td>Minority of the portfolio</td>
</tr>
</tbody>
</table>
Change and the Climate Smart Land Network, we are preparing to better understand and respond to the risks climate change poses to forestry and agriculture.

<table>
<thead>
<tr>
<th>Investing (Asset owner)</th>
<th>Yes</th>
<th>Majority of the portfolio</th>
<th>Manulife will assess forest related risks and opportunities if it is a material risk for an investment. Currently that would include our timber equity and debt portfolios.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insurance underwriting (Insurance company)</td>
<td>Not applicable</td>
<td>This is not applicable to our insurance underwriting business.</td>
<td></td>
</tr>
<tr>
<td>Other products and services, please specify</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**C-FS2.2f**

(C-FS2.2f) Do you request climate-related information from your clients/investees as part of your due diligence and/or risk assessment practices?

<table>
<thead>
<tr>
<th></th>
<th>We request climate-related information</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investing (Asset manager)</td>
<td>Yes, for some</td>
<td>Investment teams consider ESG factors which may be material to their investment thesis during initial and ongoing due diligence. We request climate-related information from some of our clients/investees as part of our due diligence practice.</td>
</tr>
<tr>
<td>Investing (Asset owner)</td>
<td>Yes, for some</td>
<td>We request climate-related information from some of our clients/investees as part of our due diligence practice. Manulife has a set of ESG Guidelines to follow when assessing ESG-related risks and opportunities, including climate related ones. Formal processes are still being put in place.</td>
</tr>
<tr>
<td>Insurance underwriting (Insurance company)</td>
<td>Not applicable</td>
<td>Not applicable to our insurance underwriting business.</td>
</tr>
<tr>
<td>Other products and services, please specify</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Risk 1</th>
</tr>
</thead>
</table>

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Primary potential financial impact

Increased indirect (operating) costs

Climate risk type mapped to traditional financial services industry risk classification

Operational risk

Company-specific description

The Montreal Protocol is leading to the phase-out of HCFC-22 gases in air conditioning equipment. A significant portion of the air conditioning units in Real Estate’s portfolio uses HCFC refrigerants (primarily R-22), which is a potent GHG. Due to phase-out regulations in Canada and the U.S., HCFC-22 refrigerants are being eliminated from the supply chain and no HCFC-22 (R-22) equipment will be manufactured in or imported into Canada. These policies could increase service and maintenance requirements as HCFC equipment may need to be retired before its typical replacement period.

Time horizon

Short-term

Likelihood

Virtually certain

Magnitude of impact

Medium-low

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate
Potential financial impact figure (currency)  
5,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure
Assuming 25%-50% of properties in Real Estate offices portfolio will require a chiller retrofit, capital costs could be in the range of $5 million per year. In 2017, chiller replacements in Chicago received almost $600,000 in government rebates to reduce this cost.

Cost of response to risk
0

Description of response and explanation of cost calculation
HCFC chillers, we try where possible to use low-GHG alternative gases. We are currently assessing the scale of this risk for operations and plan to compile a consolidated inventory of chiller equipment across the portfolio to design a strategy to comply with phase-out regulations. There is no additional cost for managing this risk. It is part of Manulife Real Estate’s Operations and Engineering and Technical Services group mandate.

Comment

Identifier
Risk 2

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver
Emerging regulation
Carbon pricing mechanisms

Primary potential financial impact
Increased indirect (operating) costs

Climate risk type mapped to traditional financial services industry risk classification
Policy and legal risk

Company-specific description
Carbon taxes and cap and trade programs came into effect in Alberta and Ontario in 2017, two provinces where Real Estate has operations, as well as in the state of California. A national price for carbon emissions will be rolled out where Real Estate operates. Carbon pricing schemes increase operating costs and is proportionately impacts costs for less efficient properties.

**Time horizon**
- Short-term

**Likelihood**
- Virtually certain

**Magnitude of impact**
- Medium-low

**Are you able to provide a potential financial impact figure?**
- Yes, a single figure estimate

**Potential financial impact figure (currency)**
- 4,800,000

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact figure**
The Canadian Tax Journal estimates that a $50 per tonne Carbon tax would mean a 30% price increase in natural gas and a 13% price increase in electricity. This would translate to additional costs of $4.8 million for all Canadian operations by 2022. Other regions, such as California, would also see proportionally similar costs.

**Cost of response to risk**
- 0

**Description of response and explanation of cost calculation**
Estimated budget increases from carbon pricing is included in property budgets, which rolls up to business planning. For example, in 2016, Real Estate’s utility management consultants Solution 105 provided estimated cost increases to properties in Alberta for their 2017 budgeting process. There is no additional cost for managing this risk. It is part of Manulife Real Estate’s Operations and Engineering and Technical Services group mandate.

**Comment**

**Identifier**
Risk 3

Where in the value chain does the risk driver occur?
Downstream

Risk type & Primary climate-related risk driver
Market
Changing customer behavior

Primary potential financial impact
Decreased revenues due to reduced demand for products and services

Climate risk type mapped to traditional financial services industry risk classification
Operational risk

Company-specific description
Increasing demand for sustainable and energy-efficient properties, particularly in the commercial office portfolio may lead to risk of properties underperforming or not meeting tenants’ sustainability demands. Additionally, tenants and investors place greater expectations on companies to manage and disclose their sustainability performance.

Time horizon
Short-term

Likelihood
Very likely

Magnitude of impact
Medium-low

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
85,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure
Manulife Investment Management’s real estate group has set five-year targets for energy, water and waste that managers are assessed against annually. Manager performance is also benchmarked against other portfolio performance and benchmarks such as GRESB. Real Estate’s Sustainable Building Standards program applies to both third-party and internal managers. Our minimum expectation in the program includes all properties having an energy management plan, track annual utility consumption, and
engage with tenants on sustainability.

Manulife Investment Management’s real estate team has had strong energy, water and waste management practices in place for many years and has five-year 10% energy reduction, 7.5% water reduction and 65% waste diversion targets. Tracking energy and water performance over time has shown consistent decreases in energy and water use intensities and resulted in average energy and water use intensities that are below industry benchmarks for the properties we have owned and managed for many years. For newer properties, programs have not been in place long enough to realize the same positive impact.

Cost of response to risk

0

Description of response and explanation of cost calculation

Given the rising demand among commercial tenants, Manulife continues to invest in sustainability to attract and retain tenants and sustain occupancy. As of end of 2019, Manulife had 48.7 million square feet certified to LEED, BOMA BEST or Energy Star. There is no additional cost for managing this risk. It is part of Manulife Investment Management’s real estate arm’s Sustainability and Asset Management’s mandates.

Comment

Identifier
Risk 4

Where in the value chain does the risk driver occur?
Direct operations

Risk type & Primary climate-related risk driver
Current regulation
Mandates on and regulation of existing products and services

Primary potential financial impact
Increased capital expenditures

Climate risk type mapped to traditional financial services industry risk classification
Operational risk

Company-specific description
Mandatory building disclosure for energy and water performance is in place in many US cities where Real Estate operates and was launched in the Province of Ontario in 2018. Other cities and regions will likely follow. These regulations add transparency may
reduce demand for properties that are below average efficiency. These regulations may require capital to improve efficiency to make properties marketable.

**Time horizon**
- Short-term

**Likelihood**
- About as likely as not

**Magnitude of impact**
- Low

**Are you able to provide a potential financial impact figure?**
- No, we do not have this figure

**Potential financial impact figure (currency)**
- Potential financial impact figure – minimum (currency)
- Potential financial impact figure – maximum (currency)

**Explanation of financial impact figure**
- Estimated financial impacts are difficult to assess as costs for any property will depend on local market performance relative to similar properties. Property costs may include lower vacancy rates in poorly performing properties or capital costs to improve efficiency. There are also small costs to comply with disclosure requirements.

**Cost of response to risk**
- 0

**Description of response and explanation of cost calculation**
- Properties are required to disclose performance in Chicago, New York and Boston, due to municipal programs. Many properties utilize third-party consultants to comply with regulations and verify data. There is no additional cost for managing this risk. It is part of Manulife Investment Management’s real estate arm Sustainability mandate.

**Comment**

---

**Identifier**
- Risk 5

**Where in the value chain does the risk driver occur?**
- Direct operations

**Risk type & Primary climate-related risk driver**
Chronic physical
Changes in precipitation patterns and extreme variability in weather patterns

Primary potential financial impact
Increased direct costs

Climate risk type mapped to traditional financial services industry risk classification
Operational risk

Company-specific description
Extreme high temperatures or increased presence of storms increase the risk of disrupted electricity supply resulting in the need to operationalize business continuity plans and ensure back-up fuel sources (i.e. generators).

Time horizon
Short-term

Likelihood
Very likely

Magnitude of impact
Medium-low

Are you able to provide a potential financial impact figure?
No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure
Real Estate has not assessed the scale of this risk in financial terms, but we expect disruptions caused by extreme temperatures to have minimal impact on financial returns given the distributed nature of Real Estate’s operations and the business continuity plans already in place for such events. Real Estate has already equipped properties with generation capacity to provide electricity during black-outs. Both at the time of the acquisition, and on a rolling review basis, we identify flood risk, and prepare flood plans. These are conducted both by our Technical Services team, and our insurance provider.

Cost of response to risk
5,000,000

Description of response and explanation of cost calculation
Most properties have a business continuity plan to respond to supply disruptions. We also view improved energy efficiency as a method to manage the risk of extraordinary energy costs during periods of high electricity demand. Energy is tracked at all properties that pay for utilities. Annual performance at all properties is examined and reported internally by our energy management provider, Solution105. The cost to develop and implement business continuity plans and flood plans is low, and mainly relates to internal employee training costs. With respect to energy costs, the extraordinary costs related to extreme weather in the real estate portfolio are estimated at $5 million per year.

Comment

---

**Identifier**
Risk 6

**Where in the value chain does the risk driver occur?**
Direct operations

**Risk type & Primary climate-related risk driver**
Current regulation
Enhanced emissions-reporting obligations

**Primary potential financial impact**
Increased direct costs

**Climate risk type mapped to traditional financial services industry risk classification**

**Company-specific description**
There could be an increased operational cost for oil & gas producers associated with the introduction of a carbon tax and its implementation and integration with federal regulations.

**Time horizon**
Long-term

**Likelihood**
Very unlikely

**Magnitude of impact**
High

**Are you able to provide a potential financial impact figure?**
Yes, a single figure estimate

**Potential financial impact figure (currency)**
40,000,000

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact figure**

**Cost of response to risk**
250,000

**Description of response and explanation of cost calculation**
Commenced implementation of an internal carbon price. Evaluating carbon reduction investment opportunities on a case-by-case basis. Capital costs on a per case basis. G&A costs of ~$250k/year.

**Comment**

---

**Identifier**
Risk 7

**Where in the value chain does the risk driver occur?**
Direct operations

**Risk type & Primary climate-related risk driver**
Technology
Transitioning to lower emissions technology

**Primary potential financial impact**
Increased direct costs

**Climate risk type mapped to traditional financial services industry risk classification**

**Company-specific description**
Cost of compliance with new pieces of legislation implemented or pending is increasing and likely continue to rise. The federal government is contemplating dropping the reporting threshold to 10,000 tonnes CO2e/year, which will capture more NAL facilities. We are engaged with industry associations and our peers to better understand the risks and opportunities, and how the legislation will be implemented.

**Time horizon**
Manulife Financial Corp. CDP Climate Change Questionnaire 2020

Wednesday, August 26, 2020

Long-term

Likelihood
Virtually certain

Magnitude of impact
Medium-low

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
500,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure
Draft regulatory framework recommending measuring and reporting high emission intensity sites three times (3x) per year.

Cost of response to risk
200,000

Description of response and explanation of cost calculation
We are currently evaluating how this will be managed. Cost to manage will increase as site visit required 3x year for high emission intensity sites.

Comment

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?
Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier
Opp1
<table>
<thead>
<tr>
<th><strong>Where in the value chain does the opportunity occur?</strong></th>
<th>Downstream</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Opportunity type</strong></td>
<td>Products and services</td>
</tr>
<tr>
<td><strong>Primary climate-related opportunity driver</strong></td>
<td>Development and/or expansion of low emission goods and services</td>
</tr>
<tr>
<td><strong>Primary potential financial impact</strong></td>
<td>Increased revenues resulting from increased demand for products and services</td>
</tr>
<tr>
<td><strong>Company-specific description</strong></td>
<td>Commercial office tenants are increasingly looking to occupy properties that have superior environmental performance and support tenants’ corporate sustainability objectives. Real Estate believes that its reputation as a leading owner and manager of green commercial real estate in North America has a positive impact on Manulife Investment Management’s ability to attract and retain high-quality tenants and positively influence own employees who work in those.</td>
</tr>
<tr>
<td><strong>Time horizon</strong></td>
<td>Short-term</td>
</tr>
<tr>
<td><strong>Likelihood</strong></td>
<td>Likely</td>
</tr>
<tr>
<td><strong>Magnitude of impact</strong></td>
<td>Medium-low</td>
</tr>
<tr>
<td><strong>Are you able to provide a potential financial impact figure?</strong></td>
<td>No, we do not have this figure</td>
</tr>
<tr>
<td><strong>Potential financial impact figure (currency)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Potential financial impact figure – minimum (currency)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Potential financial impact figure – maximum (currency)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Explanation of financial impact figure</strong></td>
<td>Research published in the Journal of Portfolio Management (Sep. 2015) shows that properties with sustainability ratings or certifications (e.g. Energy Star, LEED, BOMA BEST) command rental rates that are roughly 3.7 percent higher per square foot than otherwise identical properties. The same study demonstrates numerous other benefits, including lower rent concessions, higher occupancy and lower operating costs. From this study, it can be extrapolated that a LEED certification, for example, can add 10% on the market value of a property.</td>
</tr>
</tbody>
</table>
Cost to realize opportunity
0

Strategy to realize opportunity and explanation of cost calculation
Energy efficiency investment and green building certification is managed at the asset-level with sign-off at the corporate-level. Manulife Investment Management’s real estate arm encourages property managers to take advantage of local/regional energy efficiency incentives and green building schemes, such as LEED and BOMA Best (Canada). As of the end of the year 2019, Manulife had 48.7 million square feet certified to LEED, BOMA BEST or Energy Star. Real Estate integrates best sustainability practices in developments as well. Costs associated with building certifications are incorporated into a building’s operating budget; or incorporated into the development proforma and new development budget. The cost of LEED certification varies depending on the type of certification being pursued. For new construction, LEED Gold certification can add up to 4 percent to the cost of construction and more than $100,000 in additional design/consulting fees. The cost of LEED certification for existing buildings varies depending on performance, and ranges from $20,000 to $100,000 depending on required building upgrades, external consulting fees and size of the building.

Comment

Identifier
Opp2

Where in the value chain does the opportunity occur?
Downstream

Opportunity type
Products and services

Primary climate-related opportunity driver
Development and/or expansion of low emission goods and services

Primary potential financial impact
Increased revenues resulting from increased demand for products and services

Company-specific description
As tenant organizations place greater emphasis on their corporate sustainability goals, there is an opportunity to provide them with additional services related to climate change. One example would be providing tenants with renewable energy to power their operations. This can be achieved both from on-site renewable energy generation and by off-site renewable procurement.

Time horizon
Short-term
<table>
<thead>
<tr>
<th><strong>Likelihood</strong></th>
<th>About as likely as not</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Magnitude of impact</strong></td>
<td>Medium-low</td>
</tr>
<tr>
<td><strong>Are you able to provide a potential financial impact figure?</strong></td>
<td>Yes, a single figure estimate</td>
</tr>
<tr>
<td><strong>Potential financial impact figure (currency)</strong></td>
<td>700,000</td>
</tr>
<tr>
<td><strong>Potential financial impact figure – minimum (currency)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Potential financial impact figure – maximum (currency)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Explanation of financial impact figure</strong></td>
<td>The primary benefits of a renewable energy strategy and tenant offering would be differentiation and to be good corporate citizen. If, Real Estate were able to procure or generate renewable electricity and sell to 20% of tenants to cover their electricity demand, at an average rate of $5 per MWh, this could generate an additional $700,000 annually.</td>
</tr>
<tr>
<td><strong>Cost to realize opportunity</strong></td>
<td>0</td>
</tr>
<tr>
<td><strong>Strategy to realize opportunity and explanation of cost calculation</strong></td>
<td>In 2016 and 2017, Real Estate developed a strategy for renewable energy, which included large scale procurement and tenant offerings. In 2018, Real Estate looked to validate its tenant offering strategy and secure commitment to increase renewable energy procurement in the portfolio. Management costs include the time required to develop renewable energy. This cost is still being assessed as part of our strategy.</td>
</tr>
<tr>
<td><strong>Comment</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Identifier</strong></td>
<td>Opp3</td>
</tr>
<tr>
<td><strong>Where in the value chain does the opportunity occur?</strong></td>
<td>Direct operations</td>
</tr>
<tr>
<td><strong>Opportunity type</strong></td>
<td>Energy source</td>
</tr>
<tr>
<td><strong>Primary climate-related opportunity driver</strong></td>
<td></td>
</tr>
</tbody>
</table>
Use of lower-emission sources of energy

Primary potential financial impact
Returns on investment in low-emission technology

Company-specific description
Decreasing costs to produce renewable energy compared to rising overall costs for energy production create an opportunity to invest in renewable energy. Entering into long-term power purchase agreements (PPAs) provide an opportunity to support emissions reductions at properties and generate returns.

Time horizon
Short-term

Likelihood
About as likely as not

Magnitude of impact
Medium-low

Are you able to provide a potential financial impact figure?
No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure
Impacts of the opportunity depend on many factors, including deal size and structure and future energy prices. It is therefore difficult to estimate.

Cost to realize opportunity
0

Strategy to realize opportunity and explanation of cost calculation
Manulife Investment Management’s Real Estate are has engaged with Manulife investment teams to identify potential for sourcing renewable energy deals internally. The cost of management was predominantly time required by real estate employees to participate in the consortium. An energy consultant has also been utilized to assess the deal and help develop an overall strategy. This cost is still being assessed as part of our strategy.

Comment
Where in the value chain does the opportunity occur?
- Direct operations

Opportunity type
- Resource efficiency

Primary climate-related opportunity driver
- Other, please specify

Primary potential financial impact
- Other, please specify
- Resource effic., increased assets value

Company-specific description
Manulife owns a significant portfolio of timber and agricultural land. With rising average temperatures induced by a changing climate, it is likely that we will experience a longer growing season in many regions which could increase productivity and thus the overall value of our land assets.

Time horizon
- Long-term

Likelihood
- Likely

Magnitude of impact
- Medium

Are you able to provide a potential financial impact figure?
- No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure
A significant portion of our agricultural land is in North America. The IPCC reports that over the first few decades of this century, moderate climate change would increase aggregate yields of rain-fed agriculture by 5–20%, but with important variability among regions. While it is difficult to predict what impact changing temperatures will have on the value of our agricultural assets over the next several decades, it could be in the range of +10-20%.
Cost to realize opportunity

0

**Strategy to realize opportunity and explanation of cost calculation**

1. Identify those crops that farmers can produce competitively in a global market. Competitively produced crops include such staples as corn, soybeans, almonds, and walnuts. We eliminate crops that do not pass this screen. 2. Identify the low-cost production regions for those crop types that were identified in step (1). For example, although corn and soybeans can be grown in almost every state, we purchase land that produces these crops almost exclusively in the Midwest and the Mississippi Delta, avoiding higher-cost production areas. 3. Identify those properties in the low-cost production regions that have the highest expected risk-adjusted returns. Climate change-related risks figure into this analysis. This is the "bottom-up" part of the strategy, where our acquisition team and our property management partners focus their efforts. Potential acquisitions are screened to make sure properties meet client objectives and have attractive risk/return characteristics. The cost of managing the opportunity will likely not be materially different than managing assets today; rather management options will change. As such, cost of risk management in previous column is 0.

**Comment**

---

**Identifier**

Opp5

**Where in the value chain does the opportunity occur?**

Upstream

**Opportunity type**

Products and services

**Primary climate-related opportunity driver**

Development of new products or services through R&D and innovation

**Primary potential financial impact**

Other, please specify

- Reduced exposure to GHGs/ carbon pricing

**Company-specific description**

NAL has partnered with a company to replace and install low bleed controllers to reduce venting.

**Time horizon**

Short-term

**Likelihood**

Virtually certain
Magnitude of impact
   Medium

Are you able to provide a potential financial impact figure?
   Yes, a single figure estimate

Potential financial impact figure (currency)
   2,300,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure
   Estimated reduction of emissions is 45,000 tonnes per year. Using the Federal government backstop of $50/tonne equates to reductions of carbon tax paid of ~$2.3MM.

Cost to realize opportunity
   0

Strategy to realize opportunity and explanation of cost calculation
   Utilizing 3rd party company to assist management of the initiative. The company we have partnered with installed the equipment at their cost in exchange for sharing the carbon credits which they would in turn market and sell to pay for the equipment. Once the capital expenditure has been covered, the 3rd party is sharing in net carbon tax benefits.

Comment

Identifier
   Opp6

Where in the value chain does the opportunity occur?
   Upstream

Opportunity type
   Products and services

Primary climate-related opportunity driver
   Development of new products or services through R&D and innovation

Primary potential financial impact
   Other, please specify
      Reduced exposure to GHGs/ carbon pricing
Company-specific description
NAL is exploring additional technology to capture venting from production tanks.

Time horizon
Short-term

Likelihood
Virtually certain

Magnitude of impact
Medium-high

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
1,100,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure
Estimated reduction of 21,000 tonnes of emission. Using the federal backstop of $50/tonne equates to a reduction of carbon tax paid of $1.1MM.

Cost to realize opportunity
50,000

Strategy to realize opportunity and explanation of cost calculation
NAL uses an emission software to track and report on emission from equipment. Cost to realize opportunity: 50,000. Exploring options to capture and use vented gas from production tanks would be a capital cost to NAL, which is unknown at this time. We are continuing to explore options.

Comment

Identifier
Opp7

Where in the value chain does the opportunity occur?
Upstream

Opportunity type
Products and services
Primary climate-related opportunity driver
Development of new products or services through R&D and innovation

Primary potential financial impact
Other, please specify
Reduced exposure to GHGs/ carbon pricing

Company-specific description
NAL is assessing 12 additional technologies aimed at GHG reduction.

Time horizon
Short-term

Likelihood
Unknown

Magnitude of impact
Unknown

Are you able to provide a potential financial impact figure?
No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure
Unknown

Cost to realize opportunity
0

Strategy to realize opportunity and explanation of cost calculation
Unknown

NAL is assessing 12 technologies aimed at GHG reduction.

Comment

Identifier
Opp8

Where in the value chain does the opportunity occur?
<table>
<thead>
<tr>
<th><strong>Direct operations</strong></th>
</tr>
</thead>
</table>

**Opportunity type**  
Energy source

**Primary climate-related opportunity driver**  
Shift toward decentralized energy generation

**Primary potential financial impact**  
Increased revenues resulting from increased demand for products and services

**Company-specific description**  
A continued decline in solar panel prices will see more commercial properties adding solar panels to their roofs. We have already financed a small number of portfolios and anticipate more will come. These do need some support from local government and this has generally been halted in Ontario, but we do believe over time these types of assets will come back and be financeable.

**Time horizon**  
Medium-term

**Likelihood**  
Likely

**Magnitude of impact**  
Medium

Are you able to provide a potential financial impact figure?  
Yes, a single figure estimate

**Potential financial impact figure (currency)**  
100,000,000

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact figure**  
We see the potential from these types of portfolio financings in the range of $100 million of EVA (Economic Value Add). This would be the profitability over comparable public transactions or opportunity cost investments.

**Cost to realize opportunity**  
0

**Strategy to realize opportunity and explanation of cost calculation**  
Managed by current portfolio team. No additional cost to realize the opportunity.

**Comment**
**Identifier**
Opp9

**Where in the value chain does the opportunity occur?**
Direct operations

**Opportunity type**
Markets

**Primary climate-related opportunity driver**
Other, please specify

**Primary potential financial impact**
Other, please specify
Increased review, greater demand

**Company-specific description**
As with the above, our portfolio is dependent to some degree on the policy of the government and the utilities providing Power Purchase Agreements to the market. We are at a low point in the cycle right now as BC, Ontario and Quebec are absorbing the costs from the previous cycle but anticipate within the next 5 years this part of the market will come back as these provinces enter new rounds of renewable energy growth.

**Time horizon**
Medium-term

**Likelihood**
Likely

**Magnitude of impact**
Medium

**Are you able to provide a potential financial impact figure?**
Yes, a single figure estimate

**Potential financial impact figure (currency)**
250,000,000

**Potential financial impact figure – minimum (currency)**

**Potential financial impact figure – maximum (currency)**

**Explanation of financial impact figure**
As above, this number is an incremental value add number. We would typically participate in a large percentage of the new transactions in the Canadian market if and when they come to fruition. The amount would be earned over a 3 or 4-year period.

**Cost to realize opportunity**

0

**Strategy to realize opportunity and explanation of cost calculation**

Managed by current portfolio team. No additional cost to realize the opportunity.

**Comment**

---

**Identifier**

Opp10

**Where in the value chain does the opportunity occur?**

Upstream

**Opportunity type**

Products and services

**Primary climate-related opportunity driver**

Development and/or expansion of low emission goods and services

**Primary potential financial impact**

Other, please specify

Reputational benefits resulting from increased demand for goods/services

**Company-specific description**

In November 2017, Manulife issued its inaugural Singapore dollar 500 million green bond, whereby proceeds were allocated to the wind and solar energy projects in North America. In May 2018, Manulife followed up with the second CAN$ 600 million green bond issue with proceeds allocated to renewable energy, buildings energy efficiency and sustainably managed forestry.

**Time horizon**

Short-term

**Likelihood**

 Likely

**Magnitude of impact**

Medium-low

**Are you able to provide a potential financial impact figure?**

No, we do not have this figure

**Potential financial impact figure (currency)**
### Potential financial impact figure – minimum (currency)

### Potential financial impact figure – maximum (currency)

### Explanation of financial impact figure
Unknown

### Cost to realize opportunity
0

### Strategy to realize opportunity and explanation of cost calculation
Continue investing in a sustainable economy.
Managed by current portfolio team. No additional cost to realise opportunity.

### Comment

<table>
<thead>
<tr>
<th>Identifier</th>
<th>Opp11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where in the value chain does the opportunity occur?</td>
<td>Downstream</td>
</tr>
<tr>
<td>Opportunity type</td>
<td>Products and services</td>
</tr>
<tr>
<td>Primary climate-related opportunity driver</td>
<td>Development and/or expansion of low emission goods and services</td>
</tr>
<tr>
<td>Primary potential financial impact</td>
<td>Other, please specify</td>
</tr>
<tr>
<td>Company-specific description</td>
<td>Increased revenue through demand for lower emissions products and services</td>
</tr>
<tr>
<td>Time horizon</td>
<td>Short-term</td>
</tr>
<tr>
<td>Likelihood</td>
<td>Very likely</td>
</tr>
<tr>
<td>Magnitude of impact</td>
<td></td>
</tr>
</tbody>
</table>
Unknown

Are you able to provide a potential financial impact figure?
   No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure
   We actively participate in carbon markets. In 2019 alone we sold over 1.2 million credits from our New Zealand forests. Since inception, we have sold over 6.1 million metric tons of carbon credits. We anticipate growth in carbon sequestration opportunities over time, both within and outside traditional carbon markets.

Cost to realize opportunity

Strategy to realize opportunity and explanation of cost calculation
   Work with investors to develop and source capital for carbon sequestration opportunities in our timberland and agriculture businesses.

Comment

C3. Business Strategy

C3.1

(C3.1) Have climate-related risks and opportunities influenced your organization’s strategy and/or financial planning?
   Yes

C3.1a

(C3.1a) Does your organization use climate-related scenario analysis to inform its strategy?
   Yes, qualitative and quantitative

C3.1b

(C3.1b) Provide details of your organization’s use of climate-related scenario analysis.
### Climate-related scenarios and models applied

<table>
<thead>
<tr>
<th>Details</th>
</tr>
</thead>
</table>
| Within our general account investments, in 2019 an assessment of climate risk was initiated as part of our dynamic capital adequacy testing (DCAT) based on the Dutch stress test design. In 2020, we plan on utilizing a modified version of the 2019 Bank of England life insurance test including equity and bond shocks at sub-sector level and a bottom-up impact assessment. Manulife Investment Management participated in the United Nations Environment Programme—Finance Initiative (UNEP FI) pilot project, which brought together 20 of the world’s leading investors to advance the TCFD recommendations. Over the past year, the project participants developed scenarios, models, and metrics to enable scenario-based, forward-looking assessment and disclosure of climate-related risks and opportunities. With UNEP FI and expert support, the investors trialed their portfolios against a range of climate scenarios and co-developed a metric for determining the value at risk for equity, bond, and real estate portfolios. The outputs and conclusions of this group are intended to stimulate and ease adoption of the TCFD recommendations by the wider industry, including the 1,900 investor members of the Principles for Responsible Investment. Manulife Investment Management has extensive experience investing globally in public markets asset classes. In 2019, we conducted a comparison of equity portfolios in different regions to evaluate the impact of climate risk by region and the implication of these risks on asset allocation. We analyzed the impact of climate risk on companies in two existing investment portfolios from different geographic regions, under three climate scenarios. The analysis also identified the physical hazards of climate change that carry the highest potential negative impact at the portfolio level and the industries in each portfolio that are potentially most exposed to these risks. The climate risk tool employed in our scenario analysis used a 15-year timeframe to assess risks and opportunities. The output allowed for an analysis at the company level to help determine those organizations that may have greater exposures to climate risk. We believe that scenario analysis will continue to improve over time and become a meaningful tool to understand climate impacts. Our current analysis is limited to Scope 1 carbon emissions of the underlying companies, which measures direct carbon emissions from operations. Scope 2, which includes indirect emissions from the consumption of energy, such as electricity, is not included in the analysis. Future analyses may be developed to incorporate Scope 2 and Scope 3 carbon emissions. According to the scenario analysis methodology used by our service provider: Climate transition risk—or the general cost associated with moving from a...
Manulife Financial Corp. CDP Climate Change Questionnaire 2020 Wednesday, August 26, 2020

Current business-as-usual scenario in the direction of a more carbon-neutral future—represents the greatest portfolio risk. This is followed in magnitude by physical hazard risk—or the cost impact associated with extreme weather events, which we identified in our initial analysis as extreme heat, coastal flooding, and tropical cyclones.

Both climate transition and physical hazard risks may be partially offset by low-carbon technology innovation such as carbon extraction or sequestration, particularly for those companies that have invested in sustainability-related research and development. Within Manulife’s General Account investments, implementation of climate scenario analysis as recommended by the TCFD is being planned over a multi-year period.

### C3.1d

(C3.1d) Describe where and how climate-related risks and opportunities have influenced your strategy.

<table>
<thead>
<tr>
<th>Have climate-related risks and opportunities influenced your strategy in this area?</th>
<th>Description of influence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Products and services</strong></td>
<td>Yes</td>
</tr>
<tr>
<td>Real Estate: established the Renewable Energy Working Group to develop a business plan to provide a clean energy offering to its tenants. This is a multi-stakeholder group that includes members from Manulife’s specialized renewable energy project finance team to determine if there is an opportunity to leverage internal capabilities. Manulife Investment Management’s real estate arm has also developed and implemented a real estate sustainability strategy to increase the environmental performance of its portfolio to make it more appealing to Fortune 500 and other top tier tenants with sustainability objectives.</td>
<td></td>
</tr>
<tr>
<td>Agriculture and Timber Group: As an investment manager of timberland and farmland, the Agriculture and Timber Group sees opportunity in managing investments to remove carbon from the atmosphere. The Agriculture and Timber Group offers opportunities for investors to focus on carbon sequestration as a specific objective.</td>
<td></td>
</tr>
<tr>
<td><strong>Supply chain and/or value chain</strong></td>
<td>Yes</td>
</tr>
<tr>
<td>Corporate: Manulife has in place a vendor code of conduct that includes adherence to environmental standards to ensure vendors perform to a minimum standard, helping reduce</td>
<td></td>
</tr>
</tbody>
</table>
reputational and operational risk to Manulife. Vendors who provide Manulife with services and/or products are expected to adhere to the requirements of Manulife’s Vendor Code of Conduct.

<table>
<thead>
<tr>
<th>Investment in R&amp;D</th>
<th>Yes</th>
<th>NAL: encouraged partnerships with companies and other external organizations to develop creative ways to source new technologies/innovations in processes to lower GHG emissions from operations.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations</td>
<td>Yes</td>
<td>Manulife Investment Management real estate incorporates evaluation of ESG risks and opportunities in the investment and due diligence process. ESG considerations in the investment process include, but are not limited to: transportation, building safety and materials, contamination, indoor environmental quality, regulatory compliance, flooding, natural hazards, climate change risks, energy efficiency, energy supply, water efficiency, waste management, water supply, tenant engagement programs, and green leasing.</td>
</tr>
</tbody>
</table>

**C3.1e**

(C3.1e) Describe where and how climate-related risks and opportunities have influenced your financial planning.

<table>
<thead>
<tr>
<th>Financial planning elements that have been influenced</th>
<th>Description of influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row 1 Revenues</td>
<td>Manulife Investment Management’s real estate arm has developed a model of estimates of GHG reduction, capital cost, incremental life cycle cost, and GHG abatement cost (i.e. $/tCO2e). Furthermore, we have improved our ESG data inputs for the GHG model and the regulatory reporting is improving our data coverage and quality. Improving our portfolio GHG emissions helps assess the carbon footprint of new acquisitions. Therefore, we have updated our Investment ESG due diligence process to take climate change into account.</td>
</tr>
<tr>
<td>Direct costs</td>
<td>Real Estate: At select properties, capital projects, such as installation of battery storage and electric vehicle charging stations increase capital expenditures. Ideally, these items are either offset by savings from energy efficiency or help to increase tenant satisfaction and decrease vacancy. Further, we are integrating climate mitigation and adaptation into our property management Sustainable Building Standards.</td>
</tr>
<tr>
<td>Capital expenditures</td>
<td>The Agriculture and Timber Group: factors costs for achieving third-party sustainability certifications into its budgets.</td>
</tr>
</tbody>
</table>
The Agriculture and Timber Group: systematically considers climate-related risks and opportunities in acquisitions and divestments. Risks such as access to water or potential for wildfire are considered and may impact valuations.

Corporate: We raise capital on an ongoing basis and in 2017 and again in 2018, saw market opportunities to issue green bonds. We are the 1st global life insurer to issue green bonds.

C3.1f

(C3.1f) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).

N/A

C-FS3.2

(C-FS3.2) Are climate-related issues considered in the policy framework of your organization?

Yes, climate-related issues are integrated into our general policy framework that relates to our financing activities

C-FS3.2a

(C-FS3.2a) In which policies are climate-related issues integrated?

<table>
<thead>
<tr>
<th>Type of policy</th>
<th>Portfolio coverage of policy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investing (Asset manager)</td>
<td>Sustainable/Responsible Investment Policy</td>
<td>Majority of the portfolio</td>
</tr>
<tr>
<td>Investing (Asset owner)</td>
<td>Credit policy Risk policy Underwriting policy Engagement policy Sustainable/Responsible Investment Policy Investment policy/strategy Proxy voting policy</td>
<td>All of the portfolio</td>
</tr>
</tbody>
</table>


Insurance underwriting (Insurance company) | Other, please specify | Unknown
---|---|---
As part of underwriting climate change working group, we’re looking at different elements to include related to climate change.

Other products and services, please specify

**C-FS3.3**

(C-FS3.3) Are climate-related issues factored into your external asset manager selection process?

Yes, for some assets managed externally

**C-FS3.3a**

(C-FS3.3a) How are climate-related issues factored into your external asset manager selection process?

<table>
<thead>
<tr>
<th>Process for factoring climate-related issues into external asset management selection</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review asset manager's climate-related policies</td>
<td>Nil</td>
</tr>
<tr>
<td>Assessment of asset manager's climate-related performance (e.g. active ownership, proxy voting records, under-weighting in high impact activities)</td>
<td></td>
</tr>
<tr>
<td>Other, please specify</td>
<td></td>
</tr>
<tr>
<td>Some managers are SRI, so require detail from manager on actions, holdings, any non-compliant holdings. Also thematic managers who have climate or water as a theme.</td>
<td></td>
</tr>
</tbody>
</table>

**C4. Targets and performance**

**C4.1**

(C4.1) Did you have an emissions target that was active in the reporting year?

Intensity target

**C4.1b**

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number

Int 1
### Year target was set
2017

### Target coverage
Business division

### Scope(s) (or Scope 3 category)
Scope 1+2 (location-based)

### Intensity metric
Metric tons CO2e per square foot

### Base year
2017

### Intensity figure in base year (metric tons CO2e per unit of activity)
0.0053

### % of total base year emissions in selected Scope(s) (or Scope 3 category)
20

### Target year
2022

### Targeted reduction from base year (%)
10

### Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]
0.00477

### % change anticipated in absolute Scope 1+2 emissions
2

### % change anticipated in absolute Scope 3 emissions
0

### Intensity figure in reporting year (metric tons CO2e per unit of activity)
0.0048

### % of target achieved [auto-calculated]
94.3396226415

### Target status in reporting year
Underway

### Is this a science-based target?
No, but we anticipate setting one in the next 2 years

### Please explain (including target coverage)
We are targeting a 10% energy consumption reduction (energy efficiency improvement target) between 2017 to 2022 associated with carbon emission per square foot in our real estate Portfolio. Total energy consumption increased between 2017 and 2018 because of increased reporting and changes in weather. When these factors are controlled or ‘normalized’ our ‘like-for-like’ consumption was consistent.

<table>
<thead>
<tr>
<th>Target reference number</th>
<th>Int 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year target was set</td>
<td>2017</td>
</tr>
<tr>
<td>Target coverage</td>
<td>Business division</td>
</tr>
<tr>
<td>Scope(s) (or Scope 3 category)</td>
<td>Scope 1</td>
</tr>
<tr>
<td>Intensity metric</td>
<td>Metric tons CO2e per barrel of oil equivalent (BOE)</td>
</tr>
<tr>
<td>Base year</td>
<td>2017</td>
</tr>
<tr>
<td>Intensity figure in base year (metric tons CO2e per unit of activity)</td>
<td>0.036</td>
</tr>
<tr>
<td>% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure</td>
<td>86</td>
</tr>
<tr>
<td>Target year</td>
<td>2022</td>
</tr>
<tr>
<td>Targeted reduction from base year (%)</td>
<td>50</td>
</tr>
<tr>
<td>Intensity figure in target year (metric tons CO2e per unit of activity) [auto-calculated]</td>
<td>0.018</td>
</tr>
<tr>
<td>% change anticipated in absolute Scope 1+2 emissions</td>
<td>26</td>
</tr>
<tr>
<td>% change anticipated in absolute Scope 3 emissions</td>
<td>0</td>
</tr>
<tr>
<td>Intensity figure in reporting year (metric tons CO2e per unit of activity)</td>
<td></td>
</tr>
</tbody>
</table>
% of target achieved [auto-calculated]  
-66.6666666667

Target status in reporting year  
Underway

Is this a science-based target?  
No, and we do not anticipate setting one in the next 2 years

Please explain (including target coverage)  
We are targeting a 50% reduction in greenhouse gas emission intensity over five years in our oil and gas subsidiary, NAL Resources.

(C4.2) Did you have any other climate-related targets that were active in the reporting year?  
Other climate-related target(s)

(C4.2b) Provide details of any other climate-related targets, including methane reduction targets.

Target reference number  
Oth 1

Year target was set  
2017

Target coverage  
Business division

Target type: absolute or intensity  
Intensity

Target type: category & Metric (target numerator if reporting an intensity target)  
Energy consumption or efficiency  
kWh

Target denominator (intensity targets only)  
square foot

Base year
2017

Figure or percentage in base year
20.2

Target year
2020

Figure or percentage in target year
18.18

Figure or percentage in reporting year
20.8

% of target achieved [auto-calculated]
-29.702970297

Target status in reporting year
Underway

Is this target part of an emissions target?
INT 1

Is this target part of an overarching initiative?
No, it's not part of an overarching initiative

Please explain (including target coverage)
We are targeting a 10% energy reduction between 2017 to 2022 associated with equivalent kWh (ekWh) per square foot in our real estate portfolio.

Target reference number
Oth 2

Year target was set
2017

Target coverage
Business division

Target type: absolute or intensity
Intensity

Target type: category & Metric (target numerator if reporting an intensity target)
Waste management
metric tons of waste diverted from landfill
Target denominator (intensity targets only)
  metric ton of waste

Base year
  2017

Figure or percentage in base year
  52

Target year
  2020

Figure or percentage in target year
  65

Figure or percentage in reporting year
  50

% of target achieved [auto-calculated]
  -15.3846153846

Target status in reporting year
  Underway

Is this target part of an emissions target?
  This is not part of an emission target

Is this target part of an overarching initiative?
  No, it's not part of an overarching initiative

Please explain (including target coverage)
  We are targeting a 65% waste diversion rate by 2022 associated in our real estate portfolio.

Target reference number
  Oth 3

Year target was set
  2017

Target coverage
  Business division

Target type: absolute or intensity
  Intensity

Target type: category & Metric (target numerator if reporting an intensity target)
  Other, please specify
Other, please specify
Water use (L)

**Target denominator (intensity targets only)**
square foot

**Base year**
2017

**Figure or percentage in base year**
64

**Target year**
2020

**Figure or percentage in target year**
59

**Figure or percentage in reporting year**
57

**% of target achieved [auto-calculated]**
140

**Target status in reporting year**
Underway

**Is this target part of an emissions target?**
This is not part of an emission target

**Is this target part of an overarching initiative?**
No, it's not part of an overarching initiative

**Please explain (including target coverage)**
We are targeting a 7.5% water reduction between 2017 to 2022 associated with litres per square foot in our real estate portfolio.

**C4.3**

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

**C4.3a**

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.
<table>
<thead>
<tr>
<th>Initiative category &amp; Initiative type</th>
<th>Number of initiatives</th>
<th>Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under investigation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To be implemented*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementation commenced*</td>
<td>4</td>
<td>60.38</td>
</tr>
<tr>
<td>Implemented*</td>
<td>33</td>
<td>12,245</td>
</tr>
<tr>
<td>Not to be implemented</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**C4.3b**

*(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.*

<table>
<thead>
<tr>
<th>Initiative category &amp; Initiative type</th>
<th>Estimated annual CO2e savings (metric tonnes CO2e)</th>
<th>Scope(s)</th>
<th>Voluntary/Mandatory</th>
<th>Annual monetary savings (unit currency – as specified in C0.4)</th>
<th>Investment required (unit currency – as specified in C0.4)</th>
<th>Payback period</th>
<th>Estimated lifetime of the initiative</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-carbon energy consumption</td>
<td>12,103</td>
<td>Scope 2 (market-based)</td>
<td>Voluntary</td>
<td>66,347</td>
<td></td>
<td>&gt;25 years</td>
<td>&lt;1 year</td>
<td>Manulife Investment Management - 24 buildings purchased renewable energy in 2019. A total of 45,277.4 MWh of renewable energy was purchased.</td>
</tr>
</tbody>
</table>
Energy efficiency in buildings
Building Energy Management Systems (BEMS)

Estimated annual CO2e savings (metric tonnes CO2e)
0.52

Scope(s)
Scope 2 (location-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
6,500

Investment required (unit currency – as specified in C0.4)
203,096

Payback period
>25 years

Estimated lifetime of the initiative
11-15 years

Comment

Initiative category & Initiative type
Energy efficiency in buildings
Lighting

Estimated annual CO2e savings (metric tonnes CO2e)
14.17

Scope(s)
Scope 2 (location-based)

Voluntary/Mandatory
Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
84,030

Investment required (unit currency – as specified in C0.4)
365,419

Payback period
4-10 years

Estimated lifetime of the initiative
Initiative category & Initiative type
   Energy efficiency in buildings
   Motors and drives

Estimated annual CO2e savings (metric tonnes CO2e)
   125.04

Scope(s)
   Scope 2 (location-based)

Voluntary/Mandatory
   Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
   13,324

Investment required (unit currency – as specified in C0.4)
   69,493

Payback period
   4-10 years

Estimated lifetime of the initiative
   11-15 years

Comment

Initiative category & Initiative type
   Energy efficiency in buildings
   Heating, Ventilation and Air Conditioning (HVAC)

Estimated annual CO2e savings (metric tonnes CO2e)
   2.02

Scope(s)
   Scope 2 (location-based)

Voluntary/Mandatory
   Voluntary

Annual monetary savings (unit currency – as specified in C0.4)
   27,400

Comment
Investment required (unit currency – as specified in C0.4)
34,810

Payback period
1-3 years

Estimated lifetime of the initiative
11-15 years

Comment

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

<table>
<thead>
<tr>
<th>Method</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial optimization calculations</td>
<td>Investments in emissions reduction are primarily driven by a strong business case for energy efficiency. Retrofits, building upgrades, retrocommissioning and other efficiency projects are implemented across the portfolio on an ongoing basis. Government incentives further contribute to the business case, increasing rate of return on efficiency projects.</td>
</tr>
<tr>
<td>Dedicated budget for other emissions reduction activities</td>
<td>Select properties and regions have a dedicated budget for purchasing renewable energy credits. Purchased 45,300 MWh of renewable energy.</td>
</tr>
</tbody>
</table>
- Sales/distribution
- Client portfolio managers

For all investment staff, the ESG integration team has commenced periodic training sessions on ESG issues for which content and medium can vary, e.g. executive pay analysis. Training sessions are led either by the internal ESG team or leverage external service providers and experts. Investment staff attendance at ESG training sessions (internal or external) is tracked.

| Compliance with regulatory requirements/standards | Real Estate complies with all regulatory and code requirements for energy efficiency, and mandatory energy and water reporting and disclosure in the jurisdictions that we operate. |
| Internal incentives/recognition programs | Real Estate rolled out its Sustainable Building Standards program in 2017. This program rewards properties for implementing strong sustainability practices in 13 sustainability focus areas, of which 4 can be directly linked to mitigating climate impacts. |

### C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?

Yes

### C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

#### Level of aggregation

Group of products

#### Description of product/Group of products

Manulife Investment Management’s U.S. Retail business, John Hancock Investment Management, has four environmental, social and governance (ESG) dedicated John Hancock Investment Management has four environmental, social and governance (ESG) dedicated mutual funds. Our ESG lineup includes funds managed by three ESG specialist firms with proven track records of combining financial returns with positive impact. Our ESG funds are designed to help investors pursue high risk-adjusted returns relative to traditional investments, while supporting companies with strong governance that are making a positive impact on the environment and society. https://www.jhinvestments.com/esg#our-esg-funds

Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product
Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions
   Other, please specify  
   Low carbon investment funds

% revenue from low carbon product(s) in the reporting year
   0.1

% of total portfolio value

Asset classes/ product types
   Investing
   Fixed Income

Comment
   This is not applicable to John Hancock Investment Management.

Level of aggregation
   Product

Description of product/Group of products
   We actively participate in carbon markets through our Manulife Investment Management agriculture and timber businesses.

Are these low-carbon product(s) or do they enable avoided emissions?
   Low-carbon product

Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions
   Other, please specify  
   Carbon Credits

% revenue from low carbon product(s) in the reporting year

% of total portfolio value

Asset classes/ product types
   Investing
   Forestry

Comment
   Through Manulife Investment Management’s agriculture and timber businesses, we actively participate in carbon markets. In 2019 we sold over 1.2 million credits from our New Zealand forests. Since inception, we have sold over 6.1 million metric tons of carbon credits.
#### C5. Emissions methodology

#### C5.1

(C5.1) Provide your base year and base year emissions (Scopes 1 and 2).

<table>
<thead>
<tr>
<th>Scope 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Base year start</td>
<td>January 1, 2017</td>
</tr>
<tr>
<td>Base year end</td>
<td>December 31, 2017</td>
</tr>
<tr>
<td>Base year emissions (metric tons CO2e)</td>
<td>464,258</td>
</tr>
<tr>
<td>Comment</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scope 2 (location-based)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Base year start</td>
<td>January 1, 2017</td>
</tr>
<tr>
<td>Base year end</td>
<td>December 31, 2017</td>
</tr>
<tr>
<td>Base year emissions (metric tons CO2e)</td>
<td>293,348</td>
</tr>
<tr>
<td>Comment</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scope 2 (market-based)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Base year start</td>
<td>January 1, 2017</td>
</tr>
<tr>
<td>Base year end</td>
<td>December 31, 2017</td>
</tr>
<tr>
<td>Base year emissions (metric tons CO2e)</td>
<td>280,909</td>
</tr>
<tr>
<td>Comment</td>
<td></td>
</tr>
</tbody>
</table>
C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.

- ISO 14064-1
- Other, please specify

C5.2a

(C5.2a) Provide details of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.


C6. Emissions data

C6.1

(C6.1) What were your organization’s gross global Scope 1 emissions in metric tons CO2e?

<table>
<thead>
<tr>
<th>Reporting year</th>
<th>Gross global Scope 1 emissions (metric tons CO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>714,636</td>
</tr>
</tbody>
</table>

Comment

C6.2

(C6.2) Describe your organization’s approach to reporting Scope 2 emissions.

Row 1

- **Scope 2, location-based**
  - We are reporting a Scope 2, location-based figure

- **Scope 2, market-based**
  - We are reporting a Scope 2, market-based figure

Comment
C6.3

(C6.3) What were your organization’s gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based
332,132

Scope 2, market-based (if applicable)
320,941

Comment

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

Yes

C6.4a

(C6.4a) Provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure.

Source
Refrigerants and back up diesel use from NAL Resources facilities

Relevance of Scope 1 emissions from this source
Emissions are not relevant

Relevance of location-based Scope 2 emissions from this source
No emissions excluded

Relevance of market-based Scope 2 emissions from this source (if applicable)
No emissions excluded

Explain why this source is excluded
NAL Resources currently does not collect this information. We estimate that refrigerants and back up diesel fuel represent less than 1% of our emissions.
C6.5

(C6.5) Account for your organization’s gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status
Relevant, calculated

Metric tonnes CO2e
197,381

Emissions calculation methodology
We calculated the GHG emissions associated with our transactional and office paper. We apply a conversion factor of 2.541 mtCO2e/tonne of paper purchased. This emission factor is taken from the Environmental Paper Network 2015, Paper Calculator. We used the emission factor for uncoated freesheet, 0% recycled to be conservative in our calculation.

We calculate emissions from third-party data centres. This is done by multiplying the electricity use kWh by the emission factor relevant for the province or state in which the data centre is located taken from the US EPA eGrid emission factors, Summary Tables, released 2020 and the Canadian National Inventory Report written in 2019.

We calculate emissions from Contractor Fuel Use from the Manulife Investment Management’s agriculture and timber business.

Percentage of emissions calculated using data obtained from suppliers or value chain partners
100

Please explain

Capital goods

Evaluation status
Relevant, not yet calculated

Please explain

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status
Relevant, not yet calculated
<table>
<thead>
<tr>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Upstream transportation and distribution</strong></td>
</tr>
<tr>
<td><strong>Evaluation status</strong></td>
</tr>
<tr>
<td>Relevant, not yet calculated</td>
</tr>
<tr>
<td><strong>Please explain</strong></td>
</tr>
<tr>
<td>As a financial institution, emissions associated with upstream transportation and distribution are not considered material in the context of our Scope 3 value chain emission inventory.</td>
</tr>
<tr>
<td><strong>Waste generated in operations</strong></td>
</tr>
<tr>
<td><strong>Evaluation status</strong></td>
</tr>
<tr>
<td>Not relevant, calculated</td>
</tr>
<tr>
<td><strong>Metric tonnes CO2e</strong></td>
</tr>
<tr>
<td>2,782</td>
</tr>
<tr>
<td><strong>Emissions calculation methodology</strong></td>
</tr>
<tr>
<td>We measure the amount of waste to landfill in our real estate portfolio and apply a mixed municipal solid waste emission factor of 0.40 mtCO2e/tonne for waste. The emission factor comes from the EPA Waste Reduction Model (WARM), version 15, March 2019.</td>
</tr>
<tr>
<td><strong>Percentage of emissions calculated using data obtained from suppliers or value chain partners</strong></td>
</tr>
<tr>
<td>100</td>
</tr>
<tr>
<td><strong>Business travel</strong></td>
</tr>
<tr>
<td><strong>Evaluation status</strong></td>
</tr>
<tr>
<td>Relevant, calculated</td>
</tr>
<tr>
<td><strong>Metric tonnes CO2e</strong></td>
</tr>
<tr>
<td>25,835</td>
</tr>
<tr>
<td><strong>Emissions calculation methodology</strong></td>
</tr>
<tr>
<td>Employee business travel by air and by passenger car mileage is tracked centrally by our procurement team who works with our travel partners in Canada and the U.S. Emission factors for air travel are provided by the 2019 Guidelines to UK Defra GHG Conversion Factors for Company Reporting. Three different emission factors were used: 0.135 kg CO2e/km for a short-haul (&lt;483 km), 0.084kg CO2e/km for medium-haul (&gt;483 km, &lt;3700 km) and 0.11 kg CO2e/km for...</td>
</tr>
</tbody>
</table>
for long haul (>3700km). For personal car mileage the emission factor is from the EPA Emission Factor for Greenhouse Gas Inventories, March 2019.

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

100%

Please explain

**Employee commuting**

**Evaluation status**

Relevant, not yet calculated

Please explain

**Upstream leased assets**

**Evaluation status**

Not relevant, explanation provided

Please explain

All properties leased by Manulife are included in Manulife’s scope 1 and 2 emissions.

**Downstream transportation and distribution**

**Evaluation status**

Not relevant, explanation provided

Please explain

As a financial institution, emissions associated with downstream transportation and distribution are not considered material in the context of our scope 3 value chain emission inventory.

**Processing of sold products**

**Evaluation status**

Not relevant, explanation provided

Please explain

As a financial institution, emissions associated with downstream transportation and distribution are not considered material in the context of our scope 3 value chain emission inventory.

**Use of sold products**

**Evaluation status**
Not relevant, explanation provided

**Please explain**
As a financial institution, emissions associated with downstream transportation and distribution are not considered material in the context of our scope 3 value chain emission inventory.

---

**End of life treatment of sold products**

**Evaluation status**
Not relevant, explanation provided

**Please explain**
As a financial institution, emissions associated with downstream transportation and distribution are not considered material in the context of our scope 3 value chain emission inventory.

---

**Downstream leased assets**

**Evaluation status**
Relevant, calculated

**Metric tonnes CO2e**
239,093

**Emissions calculation methodology**
We calculate scope 1 and 2 emissions from properties leased by Manulife Investment Management’s agriculture and timber business.

**Percentage of emissions calculated using data obtained from suppliers or value chain partners**

**Please explain**

---

**Franchises**

**Evaluation status**
Not relevant, explanation provided

**Please explain**
As a financial institution, emissions associated with downstream transportation and distribution are not considered material in the context of our scope 3 value chain emission inventory.

---

**Other (upstream)**

**Evaluation status**
Please explain

Other (downstream)

Evaluation status

Please explain

**C6.10**

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

<table>
<thead>
<tr>
<th>Intensity figure</th>
<th>0.0000131553</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)</th>
<th>1,046,768</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Metric denominator</th>
<th>unit total revenue</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Metric denominator: Unit total</th>
<th>79,570,000,000</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Scope 2 figure used</th>
<th>Location-based</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>% change from previous year</th>
<th>48</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Direction of change</th>
<th>Decreased</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Reason for change</th>
<th>For 2019, revenue was 79.5 billion compared to 38.9 billion in 2018.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Intensity figure</th>
<th>27.8</th>
</tr>
</thead>
</table>
Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)
1,046,768

Metric denominator
full time equivalent (FTE) employee

Metric denominator: Unit total
37,642

Scope 2 figure used
Location-based

% change from previous year
5

Direction of change
Increased

Reason for change
Total FTE increase slightly from 37,263 in 2018 to 37,642. The increase is due to improvements in reporting Manulife’s inventory and including refrigerants and diesel for use for all Corporate and Real Estate properties as well as the inclusion of Manulife Investment Management’s agriculture and timber business.

C7. Emissions breakdowns

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?
Increased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.

<table>
<thead>
<tr>
<th>Change in emissions (metric tons CO2e)</th>
<th>Direction of change</th>
<th>Emissions value (percentage)</th>
<th>Please explain calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in renewable energy consumption</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
This year Manulife included diesel and fuel use from all Real Estate and Corporate properties. For the first time this year Manulife was able to include Hancock Natural Resource Group (HRNG), These additions produced a 6% increase in the overall inventory. The previous years emissions were 989,846 and the associate increase was 56,922 (1,046,768-989,846), therefore we arrive at 6% through (56,922/989,846).

### C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

- Location-based

### C8. Energy

### C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?
C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Indicate whether your organization undertook this energy-related activity in the reporting year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumption of fuel (excluding feedstocks)</td>
<td>Yes</td>
</tr>
<tr>
<td>Consumption of purchased or acquired electricity</td>
<td>Yes</td>
</tr>
<tr>
<td>Consumption of purchased or acquired heat</td>
<td>No</td>
</tr>
<tr>
<td>Consumption of purchased or acquired steam</td>
<td>Yes</td>
</tr>
<tr>
<td>Consumption of purchased or acquired cooling</td>
<td>No</td>
</tr>
<tr>
<td>Generation of electricity, heat, steam, or cooling</td>
<td>No</td>
</tr>
</tbody>
</table>

C8.2a

(C8.2a) Report your organization’s energy consumption totals (excluding feedstocks) in MWh.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Heating value</th>
<th>MWh from renewable sources</th>
<th>MWh from non-renewable sources</th>
<th>Total (renewable and non-renewable) MWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumption of fuel (excluding feedstock)</td>
<td>HHV (higher heating value)</td>
<td>0</td>
<td>1,722,413</td>
<td>1,722,413</td>
</tr>
<tr>
<td>Consumption of purchased or acquired electricity</td>
<td>39,574</td>
<td>815,333</td>
<td>854,907</td>
<td></td>
</tr>
<tr>
<td>Consumption of purchased or acquired steam</td>
<td></td>
<td>21,476</td>
<td>21,476</td>
<td></td>
</tr>
<tr>
<td>Total energy consumption</td>
<td>39,574</td>
<td>2,559,222</td>
<td>2,598,796</td>
<td></td>
</tr>
</tbody>
</table>
C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

<table>
<thead>
<tr>
<th>Scope</th>
<th>Verification/assurance status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope 1</td>
<td>Third-party verification or assurance process in place</td>
</tr>
<tr>
<td>Scope 2 (location-based or market-based)</td>
<td>Third-party verification or assurance process in place</td>
</tr>
<tr>
<td>Scope 3</td>
<td>Third-party verification or assurance process in place</td>
</tr>
</tbody>
</table>

C10.1a

(C10.1a) Provide further details of the verification/assurance undertaken for your Scope 1 emissions, and attach the relevant statements.

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement

Page/section reference
1-3

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100
(C10.1b) Provide further details of the verification/assurance undertaken for your Scope 2 emissions and attach the relevant statements.

Scope 2 approach
Scope 2 location-based

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement

Page/ section reference
1-3

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

Scope 2 approach
Scope 2 market-based

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement

Page/ section reference
1-3
Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

C10.1c

(C10.1c) Provide further details of the verification/assurance undertaken for your Scope 3 emissions and attach the relevant statements.

Scope 3 category
Scope 3: Business travel

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance

Attach the statement

Page/section reference
1-3

Relevant standard
ISO14064-3

Proportion of reported emissions verified (%)
100

Scope 3 category
Scope 3: Waste generated in operations

Verification or assurance cycle in place
Annual process

Status in the current reporting year
Complete

Type of verification or assurance
Limited assurance
Attach the statement

**Page/section reference**
1-3

**Relevant standard**
ISO14064-3

**Proportion of reported emissions verified (%)**
100

**C10.2**

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

Yes

**C10.2a**

(C10.2a) Which data points within your CDP disclosure have been verified, and which verification standards were used?

<table>
<thead>
<tr>
<th>Disclosure module verification relates to</th>
<th>Data verified</th>
<th>Verification standard</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>C8. Energy</td>
<td>Energy consumption</td>
<td>Energy Use was verified to limited assurance using the ISO14064-3 standard.</td>
<td>Manulife decided to verify energy use which includes kWh equivalent energy from use of electricity &amp; steam, and combustion of natural gas &amp; diesel fuel. We feel it is important to have these values verified to provide accuracy and transparency in the values we are reporting.</td>
</tr>
</tbody>
</table>

**C11. Carbon pricing**

**C11.2**

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

Yes

**C11.2a**

(C11.2a) Provide details of the project-based carbon credits originated or purchased by your organization in the reporting period.
Credit origination or credit purchase
Credit origination

Project type
Forests

Project identification
NZUs

Verified to which standard
Other, please specify
NZ ETS

Number of credits (metric tonnes CO2e)
1,237,958

Number of credits (metric tonnes CO2e): Risk adjusted volume
1,237,958

Credits cancelled
No

Purpose, e.g. compliance
Compliance

C11.3
(C11.3) Does your organization use an internal price on carbon?
Yes

C11.3a
(C11.3a) Provide details of how your organization uses an internal price on carbon.

Objective for implementing an internal carbon price
Change internal behavior

GHG Scope
Scope 1

Application
Carbon Tax is applied to all areas of the business including corporate building, field operations, transportation.

Actual price(s) used (Currency /metric ton)
30
Variance of price(s) used
In 2019 AB $30/tonne increasing to $50/tonne in 2023.

Type of internal carbon price
Shadow price

Impact & implication
This is related to NAL Resources. The impact and implications are to be determined.

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?
Yes, our customers
Yes, our investee companies
Yes, other partners in the value chain

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement
Education/information sharing

Details of engagement
Run an engagement campaign to educate customers about the climate change impacts of (using) your products, goods, and/or services

% of customers by number
100

% of customer - related Scope 3 emissions as reported in C6.5
0

Portfolio coverage (total or outstanding)

Please explain the rationale for selecting this group of customers and scope of engagement
Tenants’ behaviour has major impacts on a building’s energy usage and waste production as well as the use of alternate transportation and other factors that can mitigate climate impacts. By engaging tenants, Real Estate can have a much greater impact. All Real Estate properties are encouraged to participate in some form of tenant engagement. 100% - Our Sustainable Building Standards are applicable to all properties
and include tenant engagement strategies and tenant campaign materials for all properties.

**Impact of engagement, including measures of success**

Manulife Investment Management’s real estate’s Sustainable Building Standards provide guidance to our property managers on material ESG initiatives such as energy, water and waste management, and tenant and community engagement. Property managers are expected to achieve at least level 1 (out of 5 levels) for all properties in all property asset classes.

In 2019, Manulife Investment Management’s real estate team rolled out a tenant engagement calendar across global operations and tracked participation using our annual Green Champion Survey.

In our bi-annual tenant survey, 82% of our office tenants listed sustainable building operations as either “Very Important or Important”.

Manulife Investment Management’s Real Estate arm engages with tenants (i.e. customers) to foster a commitment to energy conservation, waste and carbon emission reductions. E-mail communications, tenant sustainability handbooks, newsletters, building campaign posters, LCD displays in elevators and building websites are all utilized to promote and provide updates on Manulife's initiatives and to offer ongoing reinforcement and continual education. Success is measured by improvements to footprint year over year. Real Estate has a comprehensive Sustainable Building Standards program which promotes energy and water reduction, and tenant engagement and provide properties with resources to support their sustainability activities.

### Type of engagement

**Education/information sharing**

### Details of engagement

Share information about your products and relevant certification schemes (i.e. Energy STAR)

% of customers by number

100

% of customer - related Scope 3 emissions as reported in C6.5

0

Portfolio coverage (total or outstanding)

Please explain the rationale for selecting this group of customers and scope of engagement
Real Estate fund investors increasingly care about climate risks and opportunities and want to see that they are being managed. Real Estate, therefore, wants to demonstrate to investors that climate change and sustainability are important and are managed in their portfolios. All investors are engaged through GRESB and sustainability reporting initiatives. 100% of our properties are included in our GRESB response. This information is available to investors. Further, we list the percentage of our portfolio with building certifications (LEED, Energy Star) in our Sustainability Report, which is publicly available.

Impact of engagement, including measures of success
Manulife Real Estate participates in the Global Real Estate Sustainability Benchmark (GRESB) each year for all funds. GRESB is an investor led initiative to benchmark real estate funds on sustainability performance, including aspects of climate risk and opportunity. In addition, Real Estate produces an annual sustainability report each year for all stakeholders including investors. The sustainability report includes a section on supporting the transition to a clean economy that details how Real Estate is addressing risks and opportunities related to climate change.

Further, Real Estate is responding to the GRESB assessment’s resilience questionnaire for three of our submissions.

C-FS12.1c
(C-FS12.1c) Give details of your climate-related engagement strategy with your investee companies.

<table>
<thead>
<tr>
<th>Type of engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information collection (Understanding investee behavior)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Details of engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of investees by number</td>
</tr>
<tr>
<td>49</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% Scope 3 emissions as reported in C-FS14.1a/C-FS14.1b</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Portfolio coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minority of the portfolio</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rationale for the coverage of your engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through the due diligence and risk monitoring processes, we identify companies as targets for engagement. Either the investment or ESG teams may initiate engagement. Engagement yields greater insight into the quality of a company’s ESG management</td>
</tr>
</tbody>
</table>
Impact of engagement, including measures of success
Currently, only our Manulife Investment Management group engages with our investee companies. For our engagements, we look to document and track the issue as well as any outcome achieved. Here is an example from an engagement in 2019:

ESG Issue & Explanation
Manulife IM engaged with a Chinese insurance company on their ESG disclosure, TCFD alignment, and climate change strategy. We shared our view that climate change was a key risk for the company and outlined the additional information that they could provide to help our investment analysis. We also highlighted best practices from other global insurance companies in an effort to encourage changed behaviour at the firm.

Outcome
The company subsequently joined PRI and Climate Action 100+. They further developed a low carbon strategy and began preparing their first TCFD report. This became the first TCFD report in China and they aim to be a leader in ESG standards in the country. We believe our engagement was a contributing factor to these changes. These actions by the company also bolstered our investment thesis by demonstrating that climate risks are being addressed. Our teams have since shared this firm’s TCFD report as a model for other companies in China

C12.1d
(C12.1d) Give details of your climate-related engagement strategy with other partners in the value chain.
Manulife considers other partners in the value chain to be employees, regulators, civil society and industry peers. The purpose of our climate-related engagement activities is to build our own capacity/knowledge on climate issues, help capacity build in our sector, and ensure our value chain is aligned on the management of climate-related issues. In 2019, Manulife collaborated on the following climate-related engagement strategies:

- Manulife’s Chief Financial Officer signed the Accounting for Sustainability (A4S) letter supporting the recommendations of the Financial Stability Board’s Task Force on Climate-related Financial Disclosures.
- Manulife Investment Management, Manulife’s global third-party asset management arm, was one of the founding members of the Climate Action 100+, a five-year collaborative engagement initiative involving more than 200 institutional investors. Through this initiative, we will engage with investee companies to better understand their climate risk plans and disclosures, and advocate for better practices where necessary.
- Manulife Investment Management participated in the UNEP FI investor pilot of the TCFD recommendations.
- Manulife Investment Management’s Agriculture and Timber group sponsored the Massachusetts Institute of Technology’s Joint Program on the Science and Policy of Global Change, providing the team with cutting-edge, authoritative,
peer-reviewed science related to climate change, drawing upon a range of academic disciplines from oceanography to economics.

- Manulife partnered with the Intact Centre for Climate Adaptation at the University of Waterloo to launch a foundational study of the impact of climate change on health.
- Manulife Real Estate trained more than 200 of its employees on applying sustainability fundamentals in their roles.
- Manulife Real Estate established a cross-company renewable energy working group to explore future low-carbon and carbon-free investment opportunities.
- Manulife Real Estate developed a network of more than 125 green champions, each of whom acts as the sustainability point person and role model at their respective properties.
- Manulife Real Estate is a member of the BOMA Resilience Committee to draft flood resilient guidelines for commercial properties.
- Manulife is a member of the Canadian Standards Association (CSA) Technical Committee on Sustainable and Transition along with Canadian peers in the Financial Services sector. The focus is on developing Canadian transition finance principles and taxonomy, to build on the recommendations of Canada’s Expert Panel on Sustainable Finance and contribute to the mobilization of capital associated with the global transition towards net zero greenhouse gas (GHG) emissions by 2050.

**C12.3**

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

- Direct engagement with policy makers
- Trade associations
- Funding research organizations
- Other

**C12.3a**

(C12.3a) On what issues have you been engaging directly with policy makers?

<table>
<thead>
<tr>
<th>Focus of legislation</th>
<th>Corporate position</th>
<th>Details of engagement</th>
<th>Proposed legislative solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other, please specify</td>
<td>Neutral</td>
<td>National Alliance of Forest Owners (NAFO) and by extension Manulife Investment Management’s agriculture and timber business is attempting to clarify the treatment of carbon emissions from forest biomass as carbon beneficial.</td>
<td>Amendment to the Clean Air Act.</td>
</tr>
</tbody>
</table>

**C12.3b**

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?
Yes

**C12.3c**

(C12.3c) Enter the details of those trade associations that are likely to take a position on climate change legislation.

---

**Trade association**

Canadian Association of Petroleum Producers

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association’s position**

CAPP’s position on climate change policy is that it should deliver economic growth, environmental protection and secure and reliable energy supply. It should be designed to be efficient, predictable and stable, and promote investment in technology that allows the Canadian industry to maintain competitive with other foreign jurisdictions.

**How have you influenced, or are you attempting to influence their position?**

NAL is actively engaged with the CAPP Board of Governors as well as in several CAPP committees and executive policy groups. Through NAL’s participation in CAPP governance, the company is in a position to influence policy positions related to climate change.

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**Trade association**

National Alliance of Forest Owners (NAFO)

**Is your position on climate change consistent with theirs?**

Consistent

**Please explain the trade association’s position**

This industry group is actively engaged in US policy discussions surrounding EPA GHG reporting for biomass combustion for energy generation.

**How have you influenced, or are you attempting to influence their position?**

Member of National Alliance of Forest Owners.

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**Trade association**

Australian Forest Products Association (AFPA)
Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association’s position
This industry group is actively engaged in Australian policy discussions surrounding climate impacts and opportunities of the forest products industry.

How have you influenced, or are you attempting to influence their position?
Member of Australian Forest Products Association.

Trade association
Geneva Association

Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association’s position
The Geneva Association put out a Climate Risk Statement in support of adaptation measures and other policy changes:

How have you influenced, or are you attempting to influence their position?
Manulife is a member.

Trade association
REALpac

Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association’s position
From the REALpac website “REALpac recognizes the significant environmental, social, and economic impact of Canada’s the commercial real property sector, the need for an industrial driven approach toward supporting national and provincial strategies on greenhouse gas reduction, the importance of reasoned discourse with political and policy officials and the value of persuasive arguments for sustainable economic growth. The Association also recognizes the need for industry-wide "green" benchmarking data and shared best practices, and is working with its constituents and its national and international counterparts to help to responsibly ensure the sector is well-positioned for a sustainable future”.

How have you influenced, or are you attempting to influence their position?
Manulife Investment Management’s real estate Director of Sustainability sits on the REALPAC ESG committee and provides contributions to Ontario’s future building energy benchmarking and mandatory reporting requirements.

Manulife Investment Management’s real estate Director of Sustainability is a member of the BOMA Resilience Committee to draft flood resilience guidelines for commercial properties.

Trade association
The Canadian Green Building Council (CaGBC)

Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association’s position
The CaGBC provided recommendations on how to help meet Canada’s GHG reduction goals in a 2016 report. The report outlines four key recommendations aimed at meeting Canada’s climate change targets while fueling the growth of Canada’s sustainable building industry. The four recommendations include new data proving the effectiveness of these measures, if taken immediately:
1. Meet Canada’s climate change targets by investing in and providing incentives for energy efficiency improvements (such as recommissioning, deep retrofits, solar and renewable onsite energy systems, and switching of fuel systems) in existing buildings commercial, institutional and high-rise residential buildings over 25,000 sq.ft., to reach high-performance energy efficiency.
2. Strengthen building performance by advancing building energy benchmarking, reporting and disclosure initiatives
3. Invest in netzero buildings
4. Reduce the Government’s GHG Emissions.

How have you influenced, or are you attempting to influence their position?
The Regional Managing Director, Western Canada from the real estate team is Chair of the Board of the Canada Green Building Council (CaGBC). The CaGBC provides recommendations on how to help meet Canada’s GHG reduction goals. A 2016 report outlines four key recommendations aimed at meeting Canada’s climate change targets while fueling the growth of Canada’s sustainable building industry.

Trade association
A Better City

Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association’s position
A Better City is a diverse group of business leaders united around a common goal — to enhance Boston and the region’s economic health, competitiveness, vibrancy, sustainability and quality of life. A Better City develops solutions and influences policy in three critical areas central to the Boston region’s economic competitiveness and growth — transportation and infrastructure, land use and development, and environment and energy. Under environment and energy, A Better City has three focus areas, including reducing carbon emissions and building climate resiliency. A better City has developed several resources and undertaken multiple initiatives to advance these areas.

How have you influenced, or are you attempting to influence their position?
Member.

Trade association
Clean Energy BC

Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association’s position
From the Clean Energy BC website, “Clean Energy BC has been the voice of British Columbia’s Clean Energy industry for the past 25 years. The purpose of the association is to: - Promote BC’s clean energy industry - Assist the growth of manufacturing supply, and service industry in BC serving clean energy production in BC and around the world. - Build relationships with all levels of government, BC Hydro, First Nations, environmental organizations and the public to improve the sector’s social licence. – Ensure the business and regulatory climate is reasonable and efficient for operating assets. - Improve the regulatory and economic environments for clean energy production in BC - Work with environmental organizations to develop science-based clean energy development models.

How have you influenced, or are you attempting to influence their position?
An employee is a founding member of Clean Energy BC. We have participated directly with this association to lobby for new generation programs and have assisted in drafting or commenting on new procurement initiatives.

Trade association
Ontario Waterpower Association (OWA)
Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association's position
From the OWA website, “OWA is a not-for-profit, member-based organization promoting the sustainable development of waterpower resources in Ontario.” OWA is a strong advocate of climate change initiatives.

How have you influenced, or are you attempting to influence their position?
An employee is a founding member of OWA. We have participated directly with this association to lobby for new generation programs and have assisted in drafting or commenting on new procurement initiatives.

Trade association
Massachusetts Competitive Partnership

Is your position on climate change consistent with theirs?
Consistent

Please explain the trade association's position
The Partnership includes an energy committee, which includes climate

How have you influenced, or are you attempting to influence their position?
Marianne Harrison, President of John Hancock, is a member of the organization’s Board

C12.3d

(C12.3d) Do you publicly disclose a list of all research organizations that you fund?
No

C12.3e

(C12.3e) Provide details of the other engagement activities that you undertake.
Manulife Investment Management’s Agriculture and Timber group is a member of the Climate Smart Land Network (CSLN). CSLN is an alliance of forest landowners and land managers that are working together to respond to the challenges posed by climate change. The program is structured to assist Network members in identifying and implementing pragmatic on-the-ground solutions that both meet their management goals and increase natural system resiliency to climate change.

The agriculture and timber group sponsors the Joint Program on the Science and Policy of Global Change at the Massachusetts Institute of Technology (MIT). The Joint Program provides sponsors access to historical information, analysis, projections and modeling capabilities focused on climate change and its impacts using state-of-the-art economic and earth system models. The agriculture and timber group is also a member of the
World Business Council for Sustainable Development (WBCSD), the Global Impact Investing Network (GIIN), and the Forest Climate Working Group (FCWG).

The Global Real Estate Sustainability Benchmark (GRESB) – Manulife Investment Management’s real estate arm employees participated in GRESB industry events in Canada, including a panel on transitioning to a low carbon in real estate.

Real Estate is a member of the BOMA Resilience Committee to draft flood resilient guidelines for commercial properties. Real Estate participated in consultations for the Federal Advisory Council on Climate Action and the Expert Panel on Sustainable Finance.

NAL has recently engaged Saskatchewan Research Council (SRC). This organization has developed a technical handbook identifying climate issues with potential technologies, equipment, process and solutions to implement to effectively reduce, capture and re-use emissions. NAL is actively engaged on several committees with the Petroleum Technology Alliance of Canada (PTAC). This funding organization is in a position to test new technologies providing feedback to regulatory bodies and industry on solutions to address the climate change landscape.

Manulife Asset Management became a signatory to the CDP in January 2018.

Manulife Corporate Sustainability team is working with Intact Centre on Climate Adaptation at the University of Waterloo to follow up on our 2018 report “After the Flood: The Impact of Climate Change on Mental Health and Lost Time From Work”. Our hope is to use quantitative data to gain more insight about the impacts of flooding and other natural disasters on mental health. We are currently in a preliminary phase and will continue advancing the project throughout 2019.

C12.3f

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

In 2018 Manulife introduced the Sustainability Center of Expertise, made up of sustainability leads across the Business that meet formally on a monthly basis. This group also engages with Regulatory and Public Affairs group to ensure the sharing of information and alignment.

C12.4

(C12.4) Have you published information about your organization’s response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).
C-FS12.5

(C-FS12.5) Are you a signatory of any climate-related collaborative industry frameworks, initiatives and/or commitments?
**Industry collaboration**

<table>
<thead>
<tr>
<th>Reporting framework</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equator Principles</td>
<td>• Toronto Responsible Investment (RI) Working Group</td>
</tr>
<tr>
<td>Principles for Responsible Investment (PRI)</td>
<td>• Sustainable Accounting Standards Board Investor Advisory Group (SASB IAG)</td>
</tr>
<tr>
<td>Task Force on Climate-related Financial Disclosures (TCFD)</td>
<td>• Responsible Investment Association</td>
</tr>
<tr>
<td></td>
<td>• Japan TCFD Consortium</td>
</tr>
<tr>
<td></td>
<td>• Hong Kong Green Finance Association</td>
</tr>
<tr>
<td></td>
<td>• Hong Kong Financial Services Development Council (FSDC) ESG Working Group</td>
</tr>
<tr>
<td></td>
<td>• Emerging Markets Investor Alliance (EMIA)</td>
</tr>
<tr>
<td></td>
<td>• Ceres Investor Network on Climate Risk (INCR)</td>
</tr>
<tr>
<td></td>
<td>• Canadian Coalition for Good Governance</td>
</tr>
<tr>
<td></td>
<td>• Asian Corporate Governance Association (ACGA)</td>
</tr>
<tr>
<td></td>
<td>World Benchmarking Alliance (focused on SDGs)</td>
</tr>
</tbody>
</table>

**Commitment**

30% Club Canadian Investor Group

---

**C14. Portfolio Impact**

**C-FS14.1**

*(C-FS14.1) Do you conduct analysis to understand how your portfolio impacts the climate? (Scope 3 portfolio impact)*

<table>
<thead>
<tr>
<th>We conduct analysis on our portfolio’s impact on the climate</th>
<th>Disclosure metric</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investing (Asset manager)</td>
<td>Category 15 &quot;Investment&quot; total absolute emissions Other, please specify Intensity and Absolute</td>
<td>We are planning to disclose this for portions of our portfolio in the future.</td>
</tr>
</tbody>
</table>
**Investing (Asset owner)**

<table>
<thead>
<tr>
<th></th>
<th>No, but we plan to do so in the next two years</th>
<th>In 2020 we started work on understanding our portfolio impacts on climate.</th>
</tr>
</thead>
</table>

**Insurance underwriting (Insurance company)**

<table>
<thead>
<tr>
<th></th>
<th>Not applicable</th>
<th></th>
</tr>
</thead>
</table>

**Other products and services, please specify**

<table>
<thead>
<tr>
<th></th>
<th>This is not applicable to our insurance underwriting business.</th>
<th></th>
</tr>
</thead>
</table>

## C-FS14.1a

**(C-FS14.1a) What are your organization’s Scope 3 portfolio emissions? (Category 15 “Investments” total emissions)**

**Category 15 (Investments)**

<table>
<thead>
<tr>
<th>Evaluation status</th>
<th>Relevant, not yet calculated</th>
</tr>
</thead>
</table>

**Please explain**

## C-FS14.1b

**(C-FS14.1b) What is your organization’s Scope 3 portfolio impact? (Category 15 “Investments” alternative carbon footprinting and/or exposure metrics)**

## C-FS14.1c

**(C-FS14.1c) Why do you not conduct analysis to understand how your portfolio impacts the climate? (Scope 3 Category 15 “Investments” emissions or alternative carbon footprinting and/or exposure metrics)**

In 2020 we started work on understanding our portfolio impacts on climate.

## C-FS14.2

**(C-FS14.2) Are you able to provide a breakdown of your organization's Scope 3 portfolio impact?**

<table>
<thead>
<tr>
<th>Scope 3 breakdown</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>None of the above, but we plan to do this in the next 2 years</td>
<td></td>
</tr>
</tbody>
</table>
**C-FS14.3**

(C-FS14.3) Are you taking actions to align your portfolio to a well below 2-degree world?

<table>
<thead>
<tr>
<th></th>
<th>We are taking actions to align our portfolio to a well below 2-degree world</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investing (Asset manager)</td>
<td>Yes</td>
<td>Manulife Investment Management prioritizes the impact of climate change on the economy through our company engagements. Manulife Investment Management is, for example, a lead investor for a collaborative engagement with an Oil/Gas company through Climate Action 100+ and is also a member of the steering committee for that initiative. Manulife Investment Management seeks to reduce emissions across the value chain. The team has the capability for meeting client mandates with specific objectives like reducing carbon footprints and building portfolios for client objectives. The investment teams conduct scenario analysis on the portfolios for 1.5, 2, and 3 degree alignment. Where Manulife Investment Management operates the asset class, the team works to reduce the carbon footprint.</td>
</tr>
<tr>
<td>Investing (Asset owner)</td>
<td>No</td>
<td>We started work on understanding our portfolio impacts on climate, but no timeline has been set on aligning to a below 2 degree world.</td>
</tr>
<tr>
<td>Insurance underwriting (Insurance company)</td>
<td>Not applicable</td>
<td>This is not applicable to our insurance underwriting business.</td>
</tr>
<tr>
<td>Other products and services, please specify</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**C-FS14.3a**

(C-FS14.3a) Do you assess if your clients/investees' business strategies are aligned to a well below 2-degree world?

<table>
<thead>
<tr>
<th></th>
<th>We assess alignment</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Manulife Investment Management advocates through initiatives like Climate Action 100+. The team also uses frameworks such as TCFD, SASB, and the SBTs.

C-FS14.3b

(C-FS14.3b) Do you encourage your clients/investees to set a science-based target?

<table>
<thead>
<tr>
<th>Investing (Asset manager)</th>
<th>We encourage clients/investees to set a science-based target</th>
<th>Please explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, for some</td>
<td>We encourage our clients/investees to set a science-based target through Manulife Investment Management’s commitment to Climate Action 100+.</td>
<td></td>
</tr>
</tbody>
</table>

C15. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

Nil

C15.1

(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.

<table>
<thead>
<tr>
<th>Job title</th>
<th>Corresponding job category</th>
</tr>
</thead>
<tbody>
<tr>
<td>CFO, Manulife</td>
<td>Chief Financial Officer (CFO)</td>
</tr>
</tbody>
</table>