

# 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.**

	Start date	End date	Indicate if you are providing emissions data for past reporting years
Reporting year	January 1, 2019	December 31, 2019	No

## 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.**

Position of individual(s)	Please explain
Board-level committee	<p>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.</p> <p>Examples of climate-related matters considered by this committee in 2019 include:</p> <ul style="list-style-type: none"> <li>- Reviewed our Sustainability Strategy</li> <li>- Reviewed and approved our Climate Change position Statement and TCFD disclosure</li> </ul>

## C1.1b

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

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Scope of board-level oversight	Please explain
Scheduled – all meetings	<p>Reviewing and guiding strategy</p> <p>Reviewing and guiding major plans of action</p> <p>Reviewing and guiding risk management policies</p>	<p>Climate-related risks and opportunities to our own operations</p> <p>Climate-related risks and opportunities to our investment activities</p> <p>Climate-related risks and opportunities to our insurance underwriting activities</p>	<p>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.</p>

		<p>The impact of our own operations on the climate</p> <p>The impact of our investing activities on the climate</p> <p>The impact of our insurance underwriting activities on the climate</p>	
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## C1.2

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

Name of the position(s) and/or committee(s)	Reporting line	Responsibility	Coverage of responsibility	Frequency of reporting to the board on climate-related issues
Chief Executive Officer (CEO)	Reports to the board directly	Assessing climate-related risks and opportunities	<p>Risks and opportunities related to our bank lending activities</p> <p>Risks and opportunities related to our investing activities</p> <p>Risks and opportunities related to our insurance underwriting activities</p> <p>Risks and opportunities related to our other products and services</p>	More frequently than quarterly

			Risks and opportunities related to our own operations	
Chief Financial Officer (CFO)	CEO reporting line	Both assessing and managing climate-related risks and opportunities	<p>Risks and opportunities related to our bank lending activities</p> <p>Risks and opportunities related to our investing activities</p> <p>Risks and opportunities related to our insurance underwriting activities</p> <p>Risks and opportunities related to our other products and services</p> <p>Risks and opportunities related to our own operations</p>	More frequently than quarterly
Chief Risks Officer (CRO)	CEO reporting line	Both assessing and managing climate-related risks and opportunities	<p>Risks and opportunities related to our bank lending activities</p> <p>Risks and opportunities related to our investing activities</p> <p>Risks and opportunities related to our insurance</p>	More frequently than quarterly

			<p>underwriting activities</p> <p>Risks and opportunities related to our other products and services</p> <p>Risks and opportunities related to our own operations</p>	
Chief Operating Officer (COO)	CEO reporting line	Both assessing and managing climate-related risks and opportunities	<p>Risks and opportunities related to our investing activities</p> <p>Risks and opportunities related to our own operations</p>	More frequently than quarterly
<p>Other, please specify</p> <p>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</p>	CEO reporting line	<p>Other, please specify</p> <p>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</p>	<p>Risks and opportunities related to our bank lending activities</p> <p>Risks and opportunities related to our investing activities</p> <p>Risks and opportunities related to our insurance underwriting activities</p> <p>Risks and opportunities related to our other products and services</p> <p>Risks and opportunities</p>	More frequently than quarterly

			related to our own operations	
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## 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:



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?**

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	Monetary incentives are provided for the management of climate-related issues in our Manulife Investment Management Real Estate arm.

### 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).**

Entitled to incentive	Type of incentive	Activity incentivized	Comment
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Other, please specify Real Estate Asset Manager	Monetary reward	Energy reduction target Other (please specify) Water and waste reduction targets	Manulife Investment Management’s real estate group has an Executive Sustainability Steering Committee, which includes senior representatives from across Real Estate, to oversee the sustainability (ESG) strategy and implementation. It addresses both regulatory obligations and our voluntary commitments to sustainability and excellence in environmental performance for all our operations. Annual sustainability goal achievement is considered when determining performance and annual incentive compensation for each portfolio and property manager.
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## C-FS1.4

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

	We offer an employment-based retirement scheme that incorporates ESG principles, including climate change.	Comment
Row 1	No	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.

## 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?**

	From (years)	To (years)	Comment
Short-term	0	3	
Medium-term	3	15	
Long-term	15	40	

## 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?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	<p>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.</p> <p>Examples:</p> <p>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.</p> <p>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.</p>
Emerging regulation	Relevant, always included	<p>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;</p>

		<p>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.</p> <p>Examples:</p> <p>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.</p> <p>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.</p>
Technology	Relevant, always included	<p>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.</p> <p>Examples:</p> <p>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.</p> <p>Another example is NAL Resources is always assessing technological solutions for lower emissions and the costs associated with</p>

		<p>implementing these technologies as compliance costs rise.</p> <p>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.</p>
Legal	Relevant, always included	<p>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.</p> <p>Examples: We consistently monitor the potential of legal actions or shareholder proposals/resolutions regarding our management of climate change risks.</p>
Market	Relevant, sometimes included	<p>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.</p> <p>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</p>



		<p>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.</p> <p>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.</p>
<p>Reputation</p>	<p>Relevant, always included</p>	<p>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.</p> <p>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.</p> <p>Examples:</p> <p>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.</p> <p>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.</p>

Acute physical	Relevant, always included	<p>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.</p> <p>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.</p> <p>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.</p> <p>Manulife Investment Management's Agriculture and Timber group considers wildfire risk in its timberland acquisition due diligence.</p>
Chronic physical	Relevant, always included	<p>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.</p> <p>Examples: As part of the Manulife Investment Management's Agriculture and</p>

		<p>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.</p> <p>Manulife Investment Management's Real Estate group: Relevant, always included.</p> <p>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.</p>
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## C-FS2.2b

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

	We assess the portfolio's exposure	Please explain
Investing (Asset manager)	Yes	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.
Investing (Asset owner)	Yes	We assess our portfolio's exposure to climate-related risks and opportunities for certain sectors only.
Insurance underwriting (Insurance company)	Yes	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.
Other products and services, please specify		

## C-FS2.2c

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

	Portfolio coverage	Assessment type	Description
Investing (Asset manager)	Minority of the portfolio	Qualitative and quantitative	At Manulife Investment Management, certain asset classes use a model to evaluate climate change risk which includes an assessment of the physical risks, transition risks and associated opportunities. The model creates a numerical output which measures the risk of loss for investments. At a portfolio level this helps identify the underlying companies with the greatest climate change exposure risk and whether the portfolio is more exposed to transition or physical risks. The model also helps identify companies which may be well positioned to benefit from the low carbon transition.
Investing (Asset owner)	Majority of the portfolio	Quantitative	Manulife has a set of ESG Guidelines to follow when assessing ESG-related risks and opportunities, including climate related ones.
Insurance underwriting (Insurance company)	Unknown	Qualitative and quantitative	The process of assessing the portfolio's exposure to climate-related risks and opportunities just began in late 2019. The team is looking at developing a process.

## C-FS2.2d

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

	We assess the portfolio’s exposure	Portfolio coverage	Please explain
Investing (Asset manager)	Yes	Minority of the portfolio	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.

			<p>Manulife Investment Management incorporates evaluation of ESG risks and opportunities in the investment and due diligence process.</p> <p>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.</p> <p>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.</p>
Investing (Asset owner)	Yes	Minority of the portfolio	Manulife will assess water related risks and opportunities if it is a material risk.
Insurance underwriting (Insurance company)	Yes	Unknown	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.
Other products and services, please specify			

## C-FS2.2e

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

	We assess the portfolio's exposure	Portfolio coverage	Please explain
Investing (Asset manager)	Yes	Minority of the portfolio	As an example, at Manulife Investment Management's agriculture and timber group, through our partnerships with the World Business Council on Sustainable Development's (WBCSD) Forest Solutions Group and Scaling Positive Agriculture, as well as with both the MIT Joint Program on the Science and Policy of Global

			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.
Investing (Asset owner)	Yes	Majority of the portfolio	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.
Insurance underwriting (Insurance company)	Not applicable		This is not applicable to our insurance underwriting business.
Other products and services, please specify			

## 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?**

	We request climate-related information	Please explain
Investing (Asset manager)	Yes, for some	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.
Investing (Asset owner)	Yes, for some	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.
Insurance underwriting (Insurance company)	Not applicable	Not applicable to our insurance underwriting business.
Other products and services, please specify		

## 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.**

---

**Identifier**

Risk 1

**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**

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**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**

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**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

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### 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**

Federal Carbon tax rising to \$50/tonne by 2023. Unmitigated cost annually of ~\$40MM by 2023.

**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**

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



**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**

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.

**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**

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.

**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

**Likelihood**

About as likely as not

**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)**

700,000

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

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

**Explanation of financial impact figure**

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.

**Cost to realize opportunity**

0

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

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.

**Comment**

---

**Identifier**

Opp3

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

Direct operations

**Opportunity type**

Energy source

**Primary climate-related opportunity driver**

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**

**Identifier**

Opp4

**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**

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**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**

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**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**

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**Identifier**

Opp8

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

Direct operations

**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**

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**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**

---

**Identifier**

Opp11

**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**

Other, please specify

Increased revenue through demand for lower emissions products and services

**Company-specific description**

We actively participate in carbon markets through our Manulife Investment Management agriculture and timber businesses. There could be an increase in demand for carbon credits by our clients.

**Time horizon**

Short-term

**Likelihood**

Very likely

**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**

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	Details
<p>IEA Sustainable development scenario</p> <p>IEA NPS</p> <p>IEA CPS</p> <p>Nationally determined contributions (NDCs)</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>According to the scenario analysis methodology used by our service provider: Climate transition risk—or the general cost associated with moving from a</p>

	<p>current business-as-usual scenario in the direction of a more carbon-neutral future—represents the greatest portfolio risk.</p> <p>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.</p> <p>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.</p> <p>Within Manulife’s General Account investments, implementation of climate scenario analysis as recommended by the TCFD is being planned over a multi-year period</p>
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### C3.1d

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

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	<p>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.</p> <p>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.</p>
Supply chain and/or value chain	Yes	<p>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</p>



		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.
Investment in R&D	Yes	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.
Operations	Yes	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.

### C3.1e

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

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Direct costs Capital expenditures Capital allocation Acquisitions and divestments Access to capital	<p>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.</p> <p>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.</p> <p>The Agriculture and Timber Group: factors costs for achieving third-party sustainability certifications into its budgets.</p>

		<p>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.</p> <p>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.</p>
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### 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?**

	Type of policy	Portfolio coverage of policy	Description
Investing (Asset manager)	Sustainable/Responsible Investment Policy	Majority of the portfolio	The Sustainable Investing Statement describes how we integrate material ESG factors. Provides a list of common ESG issues considered during the different stages of the investment process, including climate change.
Investing (Asset owner)	Credit policy Risk policy Underwriting policy Engagement policy Sustainable/Responsible Investment Policy Investment policy/strategy Proxy voting policy	All of the portfolio	

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

	Process for factoring climate-related issues into external asset management selection	Comment
Row 1	Review asset manager's climate-related policies Assessment of asset manager's climate-related performance (e.g. active ownership, proxy voting records, under-weighting in high impact activities) Other, please specify 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.	Nil

## 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 CO<sub>2</sub>e per square foot

**Base year**

2017

**Intensity figure in base year (metric tons CO<sub>2</sub>e per unit of activity)**

0.0053

**% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure**

20

**Target year**

2022

**Targeted reduction from base year (%)**

10

**Intensity figure in target year (metric tons CO<sub>2</sub>e 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 CO<sub>2</sub>e 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.

---

**Target reference number**

Int 2

**Year target was set**

2017

**Target coverage**

Business division

**Scope(s) (or Scope 3 category)**

Scope 1

**Intensity metric**

Metric tons CO<sub>2</sub>e per barrel of oil equivalent (BOE)

**Base year**

2017

**Intensity figure in base year (metric tons CO<sub>2</sub>e per unit of activity)**

0.036

**% of total base year emissions in selected Scope(s) (or Scope 3 category) covered by this intensity figure**

86

**Target year**

2022

**Targeted reduction from base year (%)**

50

**Intensity figure in target year (metric tons CO<sub>2</sub>e per unit of activity) [auto-calculated]**

0.018

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

26

**% change anticipated in absolute Scope 3 emissions**

0

**Intensity figure in reporting year (metric tons CO<sub>2</sub>e per unit of activity)**

0.048

**% 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

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

Other climate-related target(s)

### C4.2b

**(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.**

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation		
To be implemented*		
Implementation commenced*	4	60.38
Implemented*	33	12,245
Not to be implemented		

### C4.3b

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

---

**Initiative category & Initiative type**

Low-carbon energy consumption  
Low-carbon electricity mix

**Estimated annual CO2e savings (metric tonnes CO2e)**

12,103

**Scope(s)**

Scope 2 (market-based)

**Voluntary/Mandatory**

Voluntary

**Annual monetary savings (unit currency – as specified in C0.4)**

**Investment required (unit currency – as specified in C0.4)**

66,347

**Payback period**

>25 years

**Estimated lifetime of the initiative**

<1 year

**Comment**

Manulife Investment Management - 24 buildings purchased renewable energy in 2019. A total of 45,277.4 MWh of renewable energy was purchased.

---

**Initiative category & Initiative type**

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**

11-15 years

**Comment**

---

**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

**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?**

Method	Comment
Financial optimization calculations	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.
Dedicated budget for other emissions reduction activities	Select properties and regions have a dedicated budget for purchasing renewable energy credits. Purchased 45,300 MWh of renewable energy.
Employee engagement	<p>Select properties and regions have a dedicated budget for purchasing renewable energy credits. Purchased 45,300 MWh of renewable energy</p> <p>Real Estate provides tools and training to investment, property management and operations staff regarding integrating sustainability, including energy efficiency and related carbon reductions into investment and asset management processes.</p> <p>Manulife Investment Management’s real estate group provides employees with training, both in person and through our online training platform. Training topics include sustainability in real estate and energy management.</p> <p>More broadly, the Manulife Investment Management ESG team periodically conducts ESG-related training sessions for staff in the following departmental areas:</p> <ul style="list-style-type: none"> <li>- Investment teams (with a focus on equities/fixed income)</li> <li>- Compliance and legal</li> <li>- Marketing compliance</li> </ul>

	<ul style="list-style-type: none"> <li>- Sales/distribution</li> <li>- Client portfolio managers</li> </ul> <p>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.</p>
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).

#### Scope 1

---

**Base year start**

January 1, 2017

**Base year end**

December 31, 2017

**Base year emissions (metric tons CO2e)**

464,258

**Comment**

#### Scope 2 (location-based)

---

**Base year start**

January 1, 2017

**Base year end**

December 31, 2017

**Base year emissions (metric tons CO2e)**

293,348

**Comment**

#### Scope 2 (market-based)

---

**Base year start**

January 1, 2017

**Base year end**

December 31, 2017

**Base year emissions (metric tons CO2e)**

280,909

**Comment**



## 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

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)

The Greenhouse Gas Protocol: Scope 2 Guidance

Other, please specify

Greenhouse Gas Protocol: Scope 2 Guidance (An amendment to the GHG Protocol Corporate Standard)

### C5.2a

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

Greenhouse Gas Protocol: Scope 2 Guidance (An amendment to the GHG Protocol Corporate Standard)

## C6. Emissions data

### C6.1

**(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO<sub>2</sub>e?**

**Reporting year**

---

**Gross global Scope 1 emissions (metric tons CO<sub>2</sub>e)**

714,636

**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 CO<sub>2</sub>e?**

### 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 CO<sub>2</sub>e**

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 mtCO<sub>2</sub>e/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

**Please explain**

**Upstream transportation and distribution**

---

**Evaluation status**

Relevant, not yet calculated

**Please explain**

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.

**Waste generated in operations**

---

**Evaluation status**

Not relevant, calculated

**Metric tonnes CO<sub>2</sub>e**

2,782

**Emissions calculation methodology**

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 mtCO<sub>2</sub>e/tonne for waste. The emission factor comes from the EPA Waste Reduction Model (WARM), version 15, March 2019.

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

100

**Please explain**

**Business travel**

---

**Evaluation status**

Relevant, calculated

**Metric tonnes CO<sub>2</sub>e**

25,835

**Emissions calculation methodology**

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 CO<sub>2</sub>e/km for a short-haul (<483 km), 0.084kg CO<sub>2</sub>e/km for medium-haul (>+483km, <3700 km) and 0.11 kg CO<sub>2</sub>e/km

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 CO<sub>2</sub>e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.**

---

**Intensity figure**

0.0000131553

**Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO<sub>2</sub>e)**

1,046,768

**Metric denominator**

unit total revenue

**Metric denominator: Unit total**

79,570,000,000

**Scope 2 figure used**

Location-based

**% change from previous year**

48

**Direction of change**

Decreased

**Reason for change**

For 2019, revenue was 79.5 billion compared to 38.9 billion in 2018.

---

**Intensity figure**

27.8

**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.**

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption				



Other emissions reduction activities				
Divestment				
Acquisitions				
Mergers				
Change in output				
Change in methodology	56,922	Increased	6	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 989846 and the associate increase was 56,922 (1046768-989846), therefore we arrive at 6% through (56,922/989,846).
Change in boundary				
Change in physical operating conditions				
Unidentified				
Other				

## 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?**

More than 0% but less than or equal to 5%

## C8.2

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

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	Yes
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	No

## C8.2a

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

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	0	1,722,413	1,722,413
Consumption of purchased or acquired electricity		39,574	815,333	854,907
Consumption of purchased or acquired steam			21,476	21,476
Total energy consumption		39,574	2,559,222	2,598,796

## 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.

	Verification/assurance status
Scope 1	Third-party verification or assurance process in place
Scope 2 (location-based or market-based)	Third-party verification or assurance process in place
Scope 3	Third-party verification or assurance process in place

### 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**

**(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?**

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

## 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.**

---

### **Type of engagement**

Information collection (Understanding investee behavior)

### **Details of engagement**

#### **% of investees by number**

49

#### **% Scope 3 emissions as reported in C-FS14.1a/C-FS14.1b**

49

### **Portfolio coverage**

Minority of the portfolio

### **Rationale for the coverage of your engagement**

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

and performance, and company responses to engagement are tracked over time. In the case of equities, engagement informs each investment team's approach to proxy voting.

### **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 Real Estate participated in consultations for the Federal Advisory Council on Climate Action and the Expert Panel on Sustainable Finance
  - 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?**

Focus of legislation	Corporate position	Details of engagement	Proposed legislative solution
Other, please specify U.S. Climate Policy	Neutral	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.	Amendment to the Clean Air Act.

### 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.

---

**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.

---

**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:

<https://www.genevaassociation.org/research-topics/extreme-events-and-climate-risk/climate-risk-statement-geneva-association>.

**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).**

**Publication**

In mainstream reports

**Status**

Complete

**Attach the document**

**Page/Section reference**

6, 7, 41, 42

**Content elements**

Governance  
Strategy  
Risks & opportunities  
Emissions figures

**Comment**

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**Publication**

In voluntary sustainability report

**Status**

Complete

**Attach the document**

**Page/Section reference**

2, 5, 8, 10, 13-16, 23,24, 34-49

**Content elements**

Governance  
Strategy  
Risks & opportunities  
Emissions figures  
Other metrics

**Comment**

**C-FS12.5**

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

	Industry collaboration	Comment
Reporting framework	Equator Principles Principles for Responsible Investment (PRI) Task Force on Climate-related Financial Disclosures (TCFD)	
Industry initiative	Principles for Responsible Investment (PRI) Asia Investor Group on Climate Change (AIGCC) Climate Action 100+ International Corporate Governance Network (ICGN) The Investor Agenda UNEP FI	<ul style="list-style-type: none"> <li>• Toronto Responsible Investment (RI) Working Group</li> <li>• Sustainable Accounting Standards Board Investor Advisory Group (SASB IAG)</li> <li>• Responsible Investment Association</li> <li>• Japan TCFD Consortium</li> <li>• Hong Kong Green Finance Association</li> <li>• Hong Kong Financial Services Development Council (FSDC) ESG Working Group</li> <li>• Emerging Markets Investor Alliance (EMIA)</li> <li>• Ceres Investor Network on Climate Risk (INCR)</li> <li>• Canadian Coalition for Good Governance</li> <li>• Asian Corporate Governance Association (ACGA)</li> <li>World Benchmarking Alliance (focused on SDGs)</li> </ul>
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)**

	We conduct analysis on our portfolio's impact on the climate	Disclosure metric	Comment
Investing (Asset manager)	Yes	Category 15 "Investment" total absolute emissions Other, please specify Intensity and Absolute	We are planning to disclose this for portions of our portfolio in the future.

Investing (Asset owner)	No, but we plan to do so in the next two years		In 2020 we started work on understanding our portfolio impacts on climate.
Insurance underwriting (Insurance company)	Not applicable		
Other products and services, please specify			This is not applicable to our insurance underwriting business.

### C-FS14.1a

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

#### Category 15 (Investments)

**Evaluation status**

Relevant, not yet calculated

**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?**

	Scope 3 breakdown	Comment
Row 1	None of the above, but we plan to do this in the next 2 years	

### C-FS14.3

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

	We are taking actions to align our portfolio to a well below 2-degree world	Please explain
Investing (Asset manager)	Yes	<p>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</p> <p>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.</p>
Investing (Asset owner)	No	We started work on understanding our portfolio impacts on climate, but no timeline has been set on aligning to a below 2 degree world.
Insurance underwriting (Insurance company)	Not applicable	This is not applicable to our insurance underwriting business.
Other products and services, please specify		

### C-FS14.3a

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

	We assess alignment	Please explain

Investing (Asset manager)	Yes, for some	Manulife Investment Management advocates through initiatives like climate action 100+. The team also uses frameworks such as TCFD, SASB, and the SBTs.
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### C-FS14.3b

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

	We encourage clients/investees to set a science-based target	Please explain
Investing (Asset manager)	Yes, for some	We encourage our clients/investees to set a science-based target through Manulife Investment Management's commitment to Climate Action 100+.

## 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.**

	Job title	Corresponding job category
Row 1	CFO, Manulife	Chief Financial Officer (CFO)