

**Assurance Statement related to
Greenhouse Gas Emissions Inventory for Calendar Year 2018
prepared for The Manufacturers Life Insurance Company**

Terms of Engagement

This Assurance Statement has been prepared for The Manufacturers Life Insurance Company (Manulife).

Lloyd's Register Quality Assurance Canada Ltd. (LR) was commissioned by Manulife to assure its Greenhouse Gas (GHG) Emissions Inventory for the calendar year (CY) 2018 (hereafter referred to as "the Inventory").

The Inventory relates to direct GHG emissions (Scope 1), energy indirect GHG emissions (Scope 2) and other indirect GHG emissions (Scope 3) from company-wide business travel (air and vehicle), electricity consumption of equipment in third-party data centers, paper use, and municipal solid waste disposal generated emissions.

The Inventory includes Scope 1, Scope 2, and Scope 3 emissions from Manulife Corporate offices, Manulife Real Estate, and NAL Resources business units. Scope 1 and 2 emissions from the Hancock Natural Resources Group (HNRG) business unit have not been included in this verification, though Scope 3 emissions from business travel and paper use have been extrapolated to include HNRG.

Scope 3 emissions from municipal solid waste are currently being gathered for a portion of the properties in Manulife's portfolio. Therefore, LR was commissioned to verify the portion of data currently being gathered, presented below as percentages of the total portfolio for each business unit:

Business Unit	Data Coverage* (%)
Manulife Corporate	76
Manulife Real Estate	46
NAL Resources	0
HNRG	0
*Data coverage is percent of total floor area with reported consumption.	

The following GHG emissions sources were excluded from the Inventory on the basis of their de minimis contribution:

- Hydrofluorocarbons (HFCs);
- Diesel consumption in emergency generators for buildings

Management Responsibility

Manulife's management was responsible for preparing the Inventory and for maintaining effective internal controls over the data and information disclosed. LR's responsibility was to carry out an assurance engagement on the Inventory in accordance with our contract with Manulife.

Ultimately, the Inventory has been approved by, and remains the responsibility of Manulife.

LR's Approach

Our verification has been conducted in accordance with ISO 14064–3:2006 *Specification with guidance for validation and verification of greenhouse gas assertions* to provide limited assurance that GHG data as presented in the Inventory have been prepared in conformance with the World Resources Institute/World Business Council for Sustainable Development (WRI/WBCSD) GHG Protocol: *A Corporate Accounting and Reporting Standard* (GHG Protocol) and Manulife's GHG Accounting Policy.

To form our conclusions the assurance engagement was undertaken as a sampling exercise and covered the following activities:

- reviewed data and information related to Scope 1, Scope 2, and Scope 3 GHG emissions for CY 2018 included in the Inventory;
- reviewed the processes for the management of data and information related to the Scope 1, Scope 2, and Scope 3 GHG emissions used at the corporate level;
- interviewed relevant staff of the organization responsible for managing GHG emissions data and records; and
- verified historical GHG emissions data and records at an aggregated level for CY 2018.

Level of Assurance & Materiality

The opinion expressed in this Assurance Statement has been formed on the basis of a limited level of assurance and at a materiality of the professional judgment of the Verifier.

LR's Opinion

Based on LR's approach nothing has come to our attention that would cause us to believe that the total Scope 1, Scope 2, and Scope 3 GHG emissions disclosed in the Inventory, as summarized in Table 1 below, are not materially correct and have not been prepared in accordance with WRI/WBCSD GHG Protocol and Manulife's GHG Accounting Policy, except for the following qualifications:

- Mobile emissions from diesel use in vehicles operated by NAL Resources have not been reported.
- Fuel data from one production unit was not included in the inventory.

These findings do not have a material impact on the inventory

Signed

Dated: July 1, 2019



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LR Lead Verifier
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Table 1. Summary of Manulife GHG Inventory 2018

Scope of GHG emissions	Tonnes CO ₂ e
Direct GHG emissions (Scope 1)*	668,040
Energy indirect GHG emissions – Location Based (Scope 2)*	321,806
Energy indirect GHG Emissions – Market-based (Scope 2)*	307,656
Business Travel (Scope 3)	27,396
Paper Use (Scope 3)	9,434
Third-party Data Centers (Scope 3)	4,029
Waste (Scope 3)	2,479

* This data does not include Scope 1 and 2 emissions from the HNRG business unit, as they have not been included in this verification, though Scope 3 emissions from business travel and paper use have been extrapolated to include HNRG.

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Due to inherent limitations in any internal control, it is possible that fraud, error, or non-compliance with laws and regulations may occur and not be detected. Further, the verification was not designed to detect all weakness or errors in internal controls so far as they relate to the requirements set out above as the verification has not been performed continuously throughout the period and the verification carried out on the relevant internal controls were on a test basis. Any projection of the evaluation of control to future periods is subject to the risk that the processes may become inadequate because of changes in conditions, or that the degree of compliance with them may deteriorate.

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