Appendix C: 2024 GHG Emissions Reporting Methodology

QuadReal Property Group

1.0 Background

QuadReal Property Group (QuadReal) tracks utility use across their portfolio, including office, retail, residential and industrial assets.

Since the 2016 reporting year, Brightly Software Canada (Brightly) has prepared an emissions summary report for QuadReal's portfolio, vs. a 2007 base year.

There are two goals for this exercise:

1. To determine the energy / emissions for the portfolio following the guidance of the GHG Protocol[i], the industry standard for corporate disclosure purposes.
2. To understand the portfolio's performance vs. historical years, normalized to remove the impact of outside influences such as changes to weather and occupancy, and exceptional tenant loads.

This document details the methodology used to derive the greenhouse gas (GHG) emissions reported by QuadReal for the 2024 emission reporting year (January 1, 2024 – December 31, 2024).

2.0 Operational Boundaries

Operational boundaries define the parts of the operation, or 'activities', for which emissions will be reported. Emissions are reported for energy consumed across QuadReal's Canadian portfolio.
Scope 1, 2 and 3 emissions resulting from the operation of properties are reported.

2.1 Scope 1 Emissions

Scope 1 emissions are direct emissions that originate at QuadReal properties. These include natural gas combustion for space heating, water heating and, in some cases, cooking.

2.2 Scope 2 Emissions

Scope 2 emissions are indirect emissions from purchased electricity, steam, hot water and chilled water that is consumed at QuadReal properties, but generated elsewhere.

2.3 Scope 3 Emissions

QuadReal accounts for and reports Scope 3 emissions for tenant-controlled utilities where data is available via submetering (category 13: downstream leased assets). Where submetering data is not available to separate tenant data from bulk-metered whole building utilities, tenant energy use is included within reported Scope 1 and 2 emissions.

2.4 Exclusions

Of the relevant Scope 1 emissions applicable to QuadReal's property portfolio, fugitive emissions from refrigerants, diesel fuel used for back-up generation, and gasoline for fleet vehicle use are excluded.

Relevant Scope 3 emissions from purchased goods and services, life-cycle fuel- and energy-related activities (including SF_6 emissions from electricity transmission infrastructure), upstream transportation and distribution of purchased products, and downstream wastewater treatment are not reported. Tenant-controlled utilities, where tenants pay utility vendors directly, are also excluded from reporting due to limited data availability.

Properties under development/redevelopment or are only asset-managed by QuadReal in the reporting year are excluded.

3.0 Organizational Boundaries

Organizational boundaries define the approach to determining ownership or control over the energy and emissions reported for the property portfolio.

The operational control approach has been selected for the purposes of reporting QuadReal's emissions, defined as follows in the GHG Protocol:

> *A company has operational control over an operation if the former or one of its subsidiaries has the full authority to introduce and implement its operating policies at the operation.... Under the operational control approach, a company accounts for 100% of emissions from operations over which it or one of its subsidiaries has operational control.*

3.1 Determining Responsibility for Emissions

Per the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard[ii] for reporting emissions from leased assets, the responsibility for emissions associated with leased assets depends on the economic substance of the lease (capital or operating) and the choice of organizational boundary approach (financial control, equity share, or operational control). Under the operational control approach, an operating lease is defined as follows:

> *Lessor does not have operational control, therefore emissions associated with fuel combustion and use of purchased electricity are scope 3 (Downstream leased assets).*
>
> *Some companies may be able to demonstrate that they do have operational control over an asset leased to another company under an operating lease, especially when operational control is not perceived by the lessee. In this case, the lessor may report emissions from fuel combustion as scope 1 and emissions from the use of purchased electricity as scope 2 as long as the decision is disclosed and justified in the public report.*

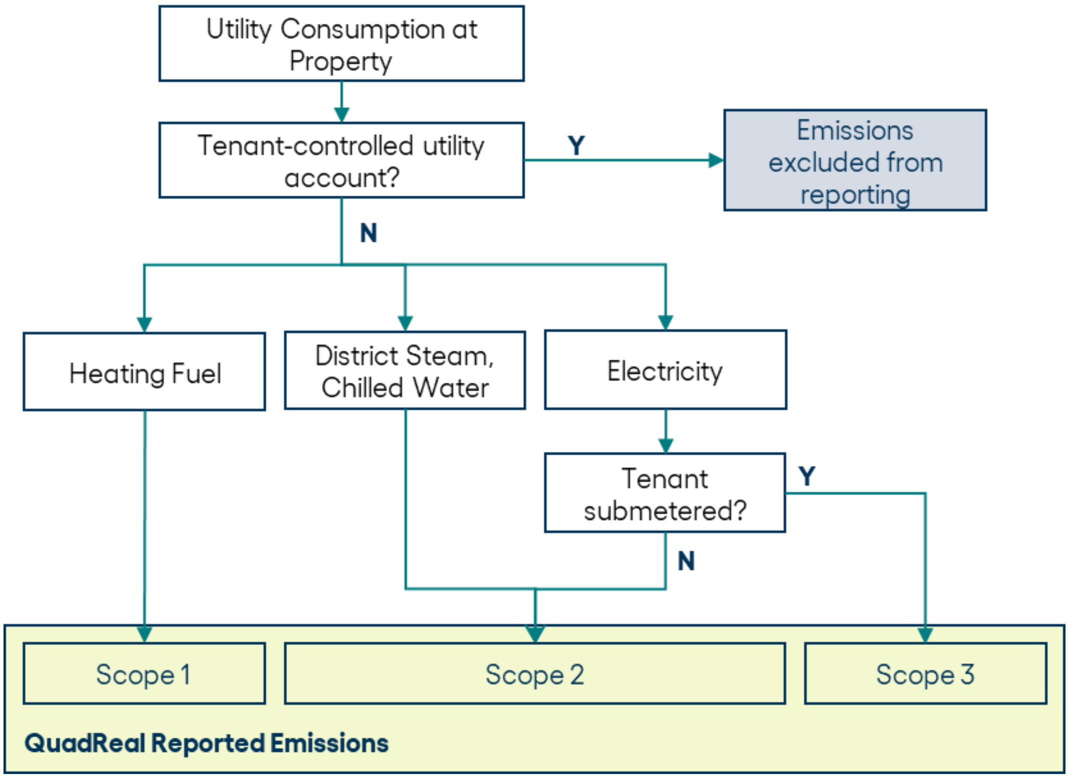
For the purposes of QuadReal's emissions reporting, where submeter data is available to separate tenant electricity use from base-building / common area electricity, tenant use is reported as scope 3. Where only bulk-metered, whole-building utility data is available, fuel and electricity use are reported as scope 1 and 2.

In cases where tenants are billed directly for utilities by the utility provider, QuadReal generally does not have access to utility data. The Scope 3 emissions associated with these tenant utilities are not included.

4.0 Application of Boundaries

The boundaries defined above are applied to utility consumption based on the following decision tree.

Emissions Scope Decision Tree



5.0 Comparison to Historical Years

For comparative purposes, 2007 was selected as the base year, as it is the first year for which data is substantially complete. 2016 is also reported to show progress since the inception of QuadReal, and 2023 is reported to show year–over–year progress.

5.1 Base Year Recalculation Policy

Energy and emissions are recalculated for the Base Year and each historical year, in keeping with the GHG Protocol, to account for the following factors:

1. Property acquisitions and divestments by QuadReal/BCI.
2. Properties or accounts owned in the base year, but previously excluded from scope.
3. Corrections to historical data based on availability of more accurate information.
4. Changes to reporting methodology.

In cases where historical data is not available, historical consumption is estimated based on the best data available. The base year is not recalculated to account for new property developments or demolitions.

Adjustments for acquisitions / divestments are treated using the 'Same-year, Pro-rata'[iii] approach, meaning that buildings only owned for a portion of the reporting year (2024) are included in all historical years for the same period. Energy use, emissions, and 'effective' gross leasable area are all adjusted proportionately for the period of ownership in 2024.

5.2 Treatment of Scope 2 Emission Factors in Historical Years

Electricity emission factors vary over time as the generation mix throughout Canada changes. Environment Canada publishes a 'National Inventory Report' (NIR) each year. QuadReal uses the latest available NIR as of December 31st, 2024. The 2024 NIR, used in the preparation of this emission report, contains annual electricity emission factors reflecting the electricity generation mix in each year from 1990-2022.

For years prior to 2022, the corresponding annual emission factors from the NIR 2024 were applied. For the years 2022 through 2024, 2022 emission factors were used.

6.0 Treatment of Water and Waste

6.1 Water Consumption

Water consumption at properties is reported using the same application of organizational boundaries (section 3.0-4.0) and base year recalculation approach (Section 5.1) used for reporting energy consumption and emissions. GHG emissions, however, are not reported for water consumption as part of QuadReal's GHG footprint.

6.2 Waste Generation

Waste generated at properties and sent to landfill is reported using the same application of organizational boundaries (section 3.0-4.0) and base year recalculation approach (Section 5.1) used for reporting energy consumption and emissions. GHG emissions, however, are not reported for waste generation as part of QuadReal's GHG footprint.

Properties previously managed by Bentall Kennedy began reporting on waste in January 2008. 2007 waste data is assumed to be equal to that of 2008.

Properties previously managed by GWL and RealStar tracked waste data in some cases, starting at different times. The data provided by QuadReal was reported as received with missing months estimated based on available data from the applicable property. This data is excluded from normalized results (see Section 9) as the source of data could not be confirmed.

Landfilled waste reported for 2007 and 2016 is reduced at some properties that send trash to Waste-to-Energy (WTE) facilities where it is used to generate electricity. QuadReal's waste haulers provide estimates as to the percentage of trash that goes to WTE facilities. In cases where estimates are not provided by haulers, it's assumed that all trash goes to landfill.

To conservatively estimate the amount of trash sent to WTE facilities, it was assumed that 10% of the material sent to WTE facilities still ends up in landfill.

Landfilled trash amounts are calculated using the following formulas for properties that send trash to WTE facilities:

Landfilled trash = trash weight produced by site – 0.9 * trash weight sent to WTE facility

Waste used for power production at WTE facilities is not included in this report on the basis that the trash is used as a fuel source, as opposed to being wasted.

The Waste-to-Energy program was canceled as of December 31, 2020, and thus does not apply to landfilled waste reported for 2021 – 2024.

7.0 Renewable Energy Credits and Carbon Offsets

Renewable Energy Credits and Carbon Offsets are two distinct mechanisms used to reduce GHG emissions. This section details how each is handled with respect to emission reporting.

7.1 Renewable Energy Credits

Renewable Energy Credits (RECs) represent the rights to the environmental benefits from generating electricity from renewable sources. RECs are purchased for some properties in the QuadReal portfolio and are reported using the Market-based Approach, as discussed below.

Market-based Approach vs. Location-based Approach

In January 2015, the World Resource Institute published the GHG Protocol Scope 2 Guidance[iv], defining two approaches to emission reporting and specifying that emissions should be reported using both approaches (dual reporting), effective as of the 2015 reporting year.

- The location-based approach reflects the average emissions intensity of grids on which energy consumption occurs and does not account for REC purchases or any other contractual instruments.
- The market-based approach reflects the emissions from electricity that QuadReal properties have chosen to purchase via contractual instruments. This approach does account for REC purchases.

In light of this guidance, both location-based and market-based emissions are reported for QuadReal's portfolio. Base Year and historical year market-based emissions have been calculated based on the GHG Scope 2 Guidance, as per the Base Year Recalculation Policy detailed in Section 5.1.

Quality Criteria

The GHG Protocol Scope 2 Guidance, discussed in Section 7.1, sets out 8 'Quality Criteria' for the inclusion of contractual instruments, such as RECs, in market-based accounting.

RECs purchased in 2016-2022 and accounted for in the reporting year for 2016 – 2023 are Green-e certified and specify 100% wind power. Green-e has stated publicly that their certified RECs meet the Quality Criteria requirements[v]. RECs purchased for QuadReal properties before 2016 do not meet the Quality Criteria as they do not convey the direct GHG emission rate attribute associated with the unit of electricity produced, and are therefore excluded from reporting.

Volume Allocation

REC contracts typically specify the volume of RECs purchased in one of two ways:

1. As a percentage of a building's electricity consumption.
2. As a fixed amount, approximating a percentage of the building's total electricity (or in some cases total energy) use over a specified number of years.

In cases where a fixed volume of RECs are purchased, there are often no start and end dates associated with the agreements; the contracts confirm only the amount of renewable energy that will be delivered to the grid and a number of years for which the contract applies. In these cases, two distinct allocation methods are employed.

1. **Property specific purchases:** It has been assumed that the contracted renewable energy volume was delivered to the grid linearly over the specified number of years, starting at the date the contract was executed.
2. **Portfolio level purchases:** The allocation in the reporting year is adjusted where needed to allow distribution of RECs across multiple years and the balance to be carried forward beyond the indicated agreement year. 2023 was the last year where portfolio level RECs (300,000MWh) purchased in 2021 were applied to.

In cases where RECs cover common area and tenant electricity use at a property, RECs are first applied to the common area consumption and the remainder are applied to tenant consumption (Scope 3).

Market-based emissions calculations

Market-based emissions are calculated as follows, in accordance to the GHG Protocol Scope 2 Guidance:

1. Electricity consumption at a property for which RECs are purchased is reported as having zero emissions, given that all RECs reported are from 100% wind generation sources.
2. For all other electricity consumed at a property, emissions are calculated using the appropriate regional emission factor[vi].
3. In cases where RECs are purchased for more than 100% of a property's electricity consumption, emissions from electricity are reported as zero (i.e. negative emissions are not reported).

7.2 Carbon Offsets

Carbon Offsets, or Verified Emissions Reductions, are direct reductions in GHG emissions that can be purchased to 'offset' property emissions. Unlike RECs, Carbon Offsets are purchased in units of 'tonnes of CO2 equivalent' (tCO2e) and are not related to electricity purchased or consumed at a property. Carbon Offsets are purchased for some properties in the portfolio to offset Scope 1 emissions. Offsets are subtracted from the total location-based and market-based emissions to report 'Net location-based' and 'Net market-based' emissions.

7.3 Purchased Renewable Natural Gas

Renewable natural gas (RNG) is natural gas produced from biomass sources, such as landfill or wastewater gas capture. Since the CO2 released from biomass combustion is assumed to originate from atmospheric CO2 the use of RNG results in biogenic CO2 emissions that can be reported outside of the Scopes. CH4 and N2O emissions generated from RNG combustion remain under Scope 1.

Similar to carbon offsets, RNG contracts give the purchaser the right to claim the environmental benefit of a certain quantity of RNG supplied to the natural gas grid. The net result is a reduction in Scope 1 emissions for properties that purchase RNG when reporting 'net' emissions including RNG.

8.0 Utility Data Estimation

There are two situations in which utility data is estimated:

1. Properties where utility data is tracked but some bills (recent or historical) are missing.
2. Properties that are within the reporting boundary, but utility data is not tracked.

8.1 Missing Utility Bills

Data Gaps

Best efforts are made to collect actual utility consumption from utility bills or utility meters for all properties/accounts. When gaps exist in verifiable utility data, consumption is estimated based on a linear regression of available utility data and actual weather data. In the case of non-weather dependent accounts, historical consumption is assumed to be equal to recent year consumption.

Baseline Consumption

Where verifiable utility data is not available for the 2007 base year, the earliest available consecutive 12 months of billed consumption is assumed for 2007 through to the earliest available bill.

Energy/emissions data from 2007-2016 is not available for the industrial properties previously managed by GWL. Historical usage is therefore estimated based on 2017 consumption for these properties.

8.2 'Not Tracked' Properties

For some properties within the reporting scope, utility data is not available for reporting. In these cases, where utility accounts controlled by QuadReal are known to exist, consumption is estimated based on the building type-specific average energy use intensity from NRCan[vii] and US EIA[viii].

For properties within the reporting scope where there are known to be no utility accounts controlled by QuadReal, consumption is set to zero.

8.3 Missing Waste Data

Where waste data is incomplete for a given site, missing data is estimated based on available data from the same site. Estimates for waste sent to landfill represented 4% of the total landfill waste reported for 2024.

Where data for waste weight is unavailable from haulers, in some cases waste generation is calculated using inputs provided by the hauler (such as container size, number of pickups, percentage filled and packing type) along with material volume-to-weight conversion factors from the US EPA[ix].

9.0 Reporting Normalized Results

To understand the change in energy use and emissions intensity excluding the impact of outside influences, a detailed variance analysis is performed to calculate 'normalized' results.

9.1 Reporting Periods

This analysis is performed for two reporting periods and corresponding sub-sets of properties:

1. 2024 vs. 2023, for properties managed from for the duration of 2023-2024
2. 2024 vs. 2007, for properties managed from for the duration of 2007-2024

In other words, properties acquired since 2023 and 2007, respectively, are not included in the analyses. New developments, however, are included in normalized results.

The impact of the following factors on energy use and emissions is calculated and subtracted from the results determined per the GHG Protocol:

1. Weather and occupancy
2. Exceptional tenant loads
3. Changing emission factors

9.2 Normalization for Weather

2007 and 2023 energy and emissions are normalized to reflect 2024 weather conditions using a linear regression analysis of energy/water consumption for each utility account as a function of heating degree hours (for accounts providing heating energy) and cooling degree hours (for accounts providing cooling energy) using hourly weather data from Environment Canada for the closest weather station to each property.

9.3 Normalization for Leased/Occupied Space

2007 and 2023 energy and emissions are normalized to reflect 2024 occupancy levels. For office buildings, normalization accounts for Occupant Density, Operating Hours and Leased Space, where data is available.

9.4 Exceptional Tenant Loads

Some tenants in QuadReal's portfolio have exceptional loads such as data centres over which QuadReal has no control. Where exceptional tenant loads are submetered and consumption data is available for the reporting period (2007-2024/2023-2024), they are removed from the normalized results such that increases or decreases from, for example, the addition or removal of large computer loads, do not affect the normalized results.

9.5 Changing Emission Factors

QuadReal's emissions are calculated using year-specific emissions factors for reporting per the GHG Protocol. When reporting normalized results, however, emissions for all years are reported using the 2022 emission factor to remove the impact of changes to the provincial electricity supply mix from the analysis.

10.0 Emission Factors

Provincial emission factors are published by Environment Canada. The factors used are 2022 values from Canada's Greenhouse Gas Inventory 1990 – 2022, published in 2024. The following table provides the source for each emission factor used.

Emission Factors and Sources – Canada

Electricity

Year	gCO_2e/kWh						
	AB	BC	MB	NS	ON	QC	SK
2007	930.0	24.0	15.0	940.0	220.0	9.1	760.0
2016	760.0	13.0	1.8	680.0	37.0	1.2	660.0
2022 – 2024	470.0	13.5	1.3	660.0	35.0	1.2	630.0

Source: Canada's Greenhouse Gas Inventory 1990–2022 (NIR 2024).

Natural Gas

Year	gCO_2e/m^3						
	AB	BC	MB	NS	ON	QC	SK
2007	1,920.4	1,911.4	1,867.6	1,868.3	1,869.3	1,868.3	1,867.5
2016	1,964.1	1,951.6	1,906.4	1,918.3	1,925.5	1,917.2	1,907.4
2022 – 2024	1,972.3	1,976.7	1,925.4	1,929.3	1,931.1	1,936.2	1,930.2

Source: Canada's Greenhouse Gas Inventory 1990–2022 (NIR 2024).

Deep Lake Water Cooling (ON)

Year	gCO2e/ton-h
	ON
2007	67.3
2016	41.3
2023	57.8
2024	57.8

Source: Enwave 2023 Emissions Stakeholder Letter; excl. distribution losses.

Steam

Year	gCO_2e/lb	
	BC	ON
2007-2010	82.2	70.9
2016	83.2	74.3
2023	89.4	70.9
2024	89.0	70.9

Source: ON – Enwave 2023 Emissions Stakeholder Letter; BC – Creative Energy 2024 Steam Emission Factor provided by direct vendor communication.

Renewable Natural Gas (BC only)

Year	gCO_2e/m^3	
	In-Scope (CH4, N2O)	Out-of-Scope (CO2)
2007 – 2024	10.3	1,966.4

Source: Canada's Greenhouse Gas Inventory 1990–2022 (NIR 2024).

Hot Water

Year	gCO_2e/MWh		
	AB	BC	North Vancouver
2007, 2016, 2023 – 2024	302,110.9	302,110.9	189,000

Source: Lonsdale Energy Customers – 2024 Annual General Meeting and Report – Lonsdale Energy. Other AB and BC Chilled Water Customers – ESPM Technical Reference, Figure 3.

11.0 Glossary of Terms

Base Year	the earliest year selected for inclusion in reporting for comparative purposes, as per Section 5
Effective GLA	gross leasable area, prorated for the period of ownership in the reporting year. Note that for GRESB/SASB reporting, the GLA is not prorated, as per GRESB reporting rules.
WTE	waste to energy, as described in Section 6.
kWh	kilowatt-hours of electricity
ekWh	equivalent kilowatt-hours (all energy types)
ekWh/ft^2	equivalent kilowatt-hours per square foot of Effective GLA
GHG	greenhouse gases. For the purposes of this report, only CO_2, CH_4, and N_2O are included. Other Kyoto Protocol greenhouse gases are excluded as they are expected to represent an immaterial fraction of QuadReal's total emissions.
CO_2e	carbon dioxide equivalent
gCO_2e	grams of carbon dioxide equivalent
tCO_2e	metric tons of carbon dioxide equivalent
tCO_2e /1,000ft^2	metric tons of carbon dioxide equivalent per 1,000 square feet of Effective GLA

[i] The GHG Protocol – A Corporate Accounting and Reporting Standard (World Resources Institute, 2004)

[ii] Corporate Value Chain (Scope 3) Accounting and Reporting Standard: Supplement to the GHG Protocol Corporate Accounting and Reporting Standard (World Resources Institute, 2011)

[iii] Base year recalculation methodologies for structural changes - Appendix E to the GHG Protocol Corporate Accounting and Reporting Standard – Revised Edition (World Resources Institute, 2005)

[iv] GHG Protocol Scope 2 Guidance – An amendment to the GHG Protocol Corporate Standard (World Resources Institute, 2015)

[v] Green-e Energy Summary of WRI Scope 2 Guidance (Centre for Resource Solutions, 2015)

[vi] As per the GHG Protocol Scope 2 Guidance, *where available*, 'Residual Mix Emission Rates' should be applied to electricity not purchased via contractual instruments (e.g. RECs) to avoid double counting of renewable energy attributes. Green-e has published Residual Mix Emission Rates for North America, however these factors correspond to NERC Regions which are not consistent the more regionally specific and widely accepted provincial factors from Environment Canada. As such, the provincial factors have been used in place of Residual Mix factors for the purposes of this report.

[vii] Survey of Commercial and Institutional Energy Use, Table 1 – Building and Establishment characteristics by primary activity, Table 7.1 Buildings – Share of fuel types by primary activity (NRCan, 2019)

[viii] Commercial Building Energy Consumption Survey', Table W1 – Water Consumption in Large Commercial Buildings (U.S Energy Information Administration, 2012)

[ix] Volume-to-Weight Conversion Factors (U.S Environmental Protection Agency Office of Resource Conservation and Recovery, 2016)