

SUMMARY OF ANNUAL GREENHOUSE GAS EMISSIONS INVENTORIES FOR THE PORT AREA.

UPDATED
08/05/2026
VERSION
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1. PROFILE OF THE PORT OF QUÉBEC

The Port of Québec, managed by the Québec Port Authority (QPA), is dedicated to promoting and developing maritime trade, serving the economic interests of the Québec region and Canada, and ensuring its profitability while respecting the community and the environment.

The Port ranks among Canada's leading ports, handling nearly 30 million metric tons of cargo annually. As the last deep-water port in the St. Lawrence–Great Lakes corridor, it boasts a water depth of 15 meters at low tide, enabling the transshipment of cargo between deep-draft vessels and smaller ships capable of traveling upriver to the Great Lakes—a market serving over 100 million people.

About fifteen port partners operate in the region and contribute to the smooth functioning of supply chains across numerous sectors, from manufacturing to agri-food. The goods that pass through the Port are essential to many industries, highlighting its direct impact on everyday life.

2. OBJECTIVES OF THE INVENTORIES

The QPA, in collaboration with its port partners, has been compiling annual inventories of greenhouse gas (GHG) emissions generated across the entire Port of Québec since 2022.

These inventories are part of a structured decarbonization initiative and pursue several key objectives, including:

- **Quantifying GHG emissions** generated within the port area to identify the main sources of emissions and set relevant reduction targets;
- **Support the development of decarbonization pathways** and the identification of concrete measures aimed at reducing emissions and improving air quality;
- **Assessing and monitoring progress** toward reduction targets;
- **Ensuring transparent public communication** of GHG emissions.



3. BASELINE YEAR AND REDUCTION TARGETS

The QPA has set specific GHG reduction targets by scope and relative to 2022 emissions (Table 1). The year 2022 was selected as the baseline year because it reflects normal operating conditions and is based on reliable and sufficient data to produce an inventory that is sufficiently representative of the main Scope 1, 2, and 3 emissions applicable.

Table1 : GHG reduction targets

Scope 1 and 2 emissions	Scope 3 emissions
- 40% by 2035 ¹	- 50% by 2030 for cruise ships through the electrification of ships at berth ¹
Aim for carbon-neutral operations by 2050.	- 40% by 2035 within the port area in collaboration with the port community ¹

In addition to aiming for carbon neutrality in its Scope 1 and 2 emissions by 2050, the QPA has set an interim target for 2035. To achieve this target, the QPA intends to implement a structured approach based on three strategic levers for action:

1. Reducing emissions at the source;
2. The gradual electrification of the vehicle and equipment fleet;
3. The promotion and integration of renewable energy.

As part of its path toward carbon neutrality, the APQ could also use offset credits, in addition to reduction measures, to neutralize its residual emissions by 2050.

¹ The targets are based on the best realistic assumptions available at the time of publication. These assumptions may stem from third parties such as the International Maritime Organization (IMO), which sets decarbonization goals for international shipping; decisions made by funding agencies; or the pricing structures of clean energy suppliers. Depending on changes in this external environment, the targets may be adjusted upward or downward.



4. METHODOLOGY

Inventories are conducted in accordance with the guidelines of the GHG Protocol and in compliance with the principles of ISO 14064-1:2018 – Part 1, by external specialists certified by the Canadian Standards Association for this standard.

The Intergovernmental Panel on Climate Change (IPCC) defines three scopes of emissions: Scope 1, Scope 2, and Scope 3. Within the context of port territory inventories, these scopes are defined as follows:

Scope 1: Direct emissions generated by energy consumption related to the QPA's activities, including the operation of its fleet of vehicles and equipment as well as the operation of the sites and buildings under its management. The QPA exercises direct control over these emissions.

Scope 2: Indirect emissions associated with the electricity consumption required for the QPA's activities. Although these emissions are generated outside the port territory, the QPA exercises direct control over the use of equipment and activities requiring this electricity.

Scope 3: Indirect emissions generated within the port territory, both on land and at sea, by the activities of ships, trucks, trains, and major port partners. These emissions are not directly generated by the QPA, which does not exercise full control over them.

The inventories compiled by the QPA cover Scope 1 and 2 emissions, as well as relevant Scope 3 emissions among the fifteen (15) categories defined by the GHG Protocol. These categories are presented in Section 4.5

4.1 EMISSION FACTORS AND GLOBAL WARMING POTENTIALS

The global warming potentials (GWPs) used are taken from the IPCC's Sixth Assessment Report for a 100-year time horizon. These are updated when new GWPs are provided by the IPCC. GHG emission factors, meanwhile, are taken from the National Inventory Report (NIR) of Environment and Climate Change Canada (ECCC). These are also updated annually.



4.2 THIRD-PARTY VERIFICATION OF SCOPE 1 AND 2 EMISSIONS

In 2024, the APQ commissioned the Bureau de normalisation du Québec (BNQ) to assess the inventory and quantification of Scope 1 and 2 GHG emissions for the base year, 2022. This verification, conducted with a reasonable level of assurance, aimed to confirm:

- the accuracy and reliability of the data;
- compliance with the principles of relevance, completeness, accuracy, and transparency set forth in ISO 14064-1:2018 – Part 1.

Upon completion of its work, the BNQ concluded that the sufficiency of the evidence was entirely satisfactory.



4.3 GEOGRAPHIC SCOPE

The geographic scope of the inventories corresponds to the administrative boundaries of the QPA (Figure 1). The land properties cover 325 hectares, of which 224 hectares are developed. The water area spans more than 10,300 hectares within the St. Lawrence River, between the shores of Québec and Lévis.

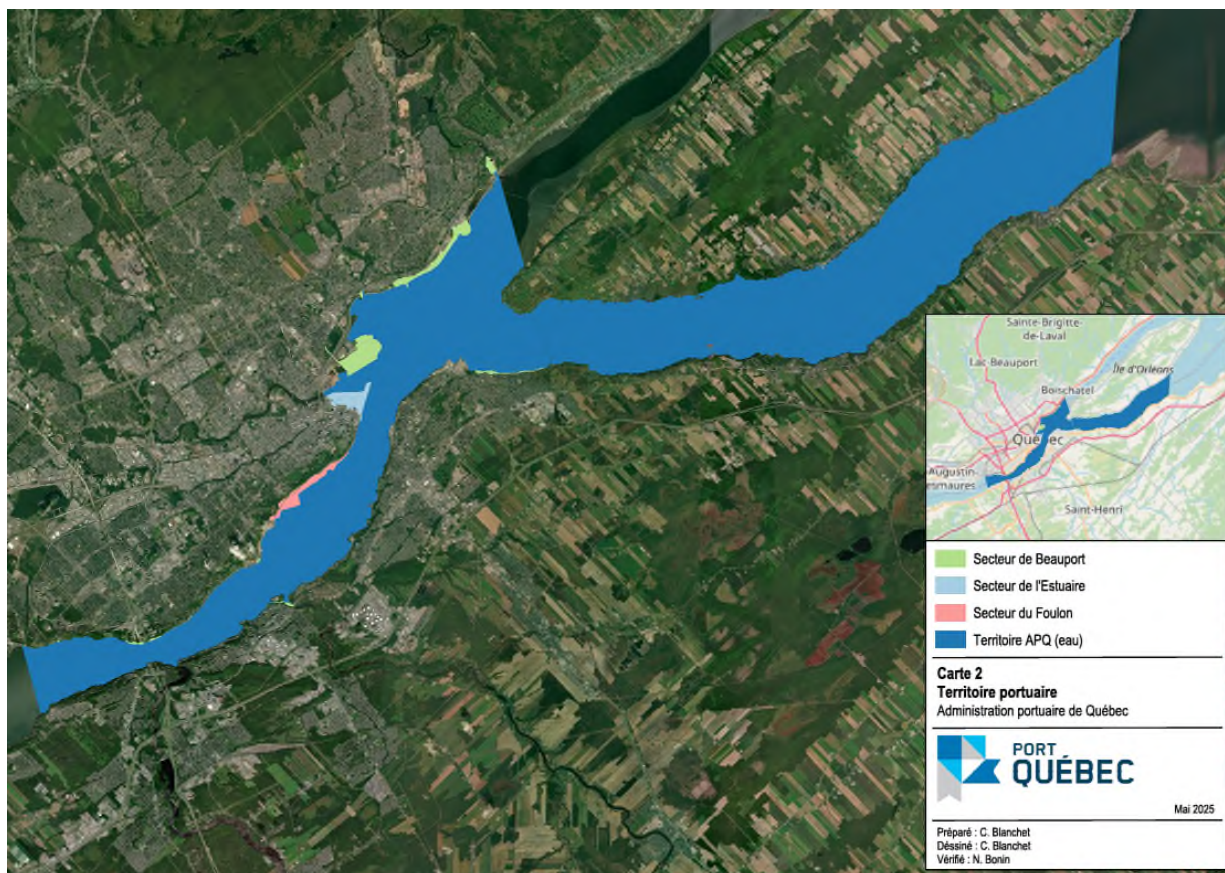


Figure1 : Port of Québec territory

4.4 OPERATIONAL SCOPE OF SCOPE 1 AND SCOPE 2 EMISSIONS

Scope 1 and 2 emissions result from the QPA’s direct operational and administrative activities, including the operation of its fleet of vehicles and equipment, as well as the operation of the sites and buildings under its management. The emission sources associated with these activities are presented in Table 2.

Table2 : Scope 1 and 2 Emission Sources

Scope	Emissions Sources	Direct activities
1	Natural gas	Building heating
	Gasoline	Patrol vehicles within the QPA territory, maintenance vehicles, and other vehicles in the QPA fleet, as well as small tools.
	Diesel	Off-road trucks, wheel loaders, material handling equipment, boats, straddle carriers, and emergency generators.
	Heating oil	Building heating
	Fugitive emissions of refrigerants	Air conditioning systems in buildings, vehicles, and off-road equipment.
	Propane	Forklift trucks
2	Hydroelectricity	Heating, cooling, and lighting; electric vehicles and trucks.

4.5 OPERATIONAL SCOPE OF SCOPE 3 EMISSIONS

The GHG Protocol provides an analytical framework that groups Scope 3 emission sources into fifteen (15) categories. In accordance with the GHG Protocol methodology, each of these categories was evaluated based on its relevance and relative significance. Categories deemed to have high relative significance are included in the inventories. A summary of this analysis is presented in Table 3.

Table3 : Consideration of Scope 3 emissions in terms of their relevance and relative importance according to the 15 categories of the GHG Protocol.

Cat.	Definition	Relative Relative ²	Consideration in inventories
1a	Acquired assets	Low	Not accounted for
1b	Accrued services (construction sites)	Moderate	Not accounted for
2	Capital and investment goods	Low	Not accounted for
3	Activities related to the extraction, production, and transportation of fuel.	Low	Not accounted for
4	Upstream transportation and distribution	Low	Not accounted for
5	Waste generated by operations	Low	Not accounted for
6	Business travel	Low	Not accounted for
7	Employees' commuting	Low	Not accounted for
8	Assets leased upstream	-	Not applicable to the QPA
9	Downstream transportation and distribution of sold products	-	Not applicable to the QPA
10	Processing of sold products	-	Not applicable to the QPA
11	Use of port infrastructure (maritime, rail, and road operations)	High	Accounted for
12	End-of-life treatment of products sold	-	Not applicable to QPA
13	Leased assets downstream (terminals and major port partners)	High	Accounted for
14	Franchises	-	Not applicable to the QPA
15	Investment	-	Not applicable to the QPA

² Low: < 1% of total estimated Scope 3 emissions; moderate: 1–10% of total; high: > 10% of total.



According to this analysis, Scope 3 emissions are primarily related to ships (Cat. 11), road and rail transport operations within the QPA territory (Cat. 11), and cargo handling operations carried out at terminals and by major port partners (Cat. 13). The methodologies used to quantify GHGs from these emission sources are summarized below:

Maritime operations (category 11): Data on maritime operations are sourced from ECCC's Marine Emissions Inventory Tool³. This tool estimates ship emissions based on their technical characteristics and geographic location. The results presented cover vessels whose quay of origin and destination are managed by the Port of Québec.

Road and rail transport (category 11): Data are estimated based on the tonnage of goods entering and leaving the port area via road and rail transport. The equation accounts for the movement of trucks and trains within the area, as well as the time spent at various terminals during loading and unloading.

Terminals and major port partners (category 13): The data used is derived from energy consumption reports provided by major port partners. It covers mobile and stationary handling equipment, energy consumption related to lighting, heating, and air conditioning in buildings, as well as fugitive emissions associated with refrigerants in air conditioning systems for vehicles and off-road equipment.

4.5.1 Construction sites (category 1b)

An estimate of GHG emissions associated with construction sites was made using factors derived from environmental impact monitoring studies developed by the United States Environmental Protection Agency. These factors are based on a database structured according to the North American Industry Classification System (NAICS) codes. Although this method allows for an assessment of the relative importance of this emissions category, the degree of precision in the calculations remains insufficient to allow for their inclusion in inventories.

³ECCC, Marine Emissions Inventory Tool: [Marine Emissions Inventory Tool - Canada.ca](https://www.ec.gc.ca/marine-emissions-inventory-tool)



The QPA therefore plans to develop, in collaboration with its contractors, more robust tools and methods to more accurately quantify GHG emissions associated with construction sites under its management in the coming years.

4.6 EMISSIONS OUTSIDE THE SCOPE OF THE INVENTORIES

The following Scope 3 emissions are not included in the inventories, either because their relative significance compared to Scope 3 emissions is considered low, because they fall outside the geographical or operational scope of the inventories, or due to limited data availability:

- ships in transit whose quay of origin and destination are not under the jurisdiction of the Port of Québec;
- private boats and vehicles;
- companies providing services to ships (e.g., refueling);
- Scope 3 emissions associated with ships (category 11), road and rail transport (category 11), and terminals and major port partners (category 13);
- certain small tenants whose emissions are considered insignificant.

5. RESULTS OF THE 2022–2024 ANNUAL INVENTORIES

This summary presents the results of the annual inventories from 2022 to 2024 by emission source. These emissions were calculated based on the best available information at the time these inventories were conducted.

5.1 SCOPE 1, 2, AND 3 EMISSIONS WITHIN THE PORT AREA

Table 4 presents annual GHG emissions within the Port of Québec territory, broken down by source, activity, and scope for the years 2022 to 2024. The results are presented in absolute values in metric tons of CO₂ equivalent (CO₂ eq.)

Table 4 : Annual GHG Inventories for the Port of Québec Territory

Emissions Sources	Activities	Scope	2022 (CO ₂ eq.)	2023 (CO ₂ -eq.)	2024 (CO ₂ eq.)
Quebec Port Authority	Vehicle fleet and building operations	1	433	435	438
		2	13	13	13
Maritime Operations (Cargo)	Maritime operations involving ships at anchor, maneuvering, and at berth	3	36,994	33,785	36,370
Maritime operations (cruises)			10,440	14,330	11,841
Terminals and port partners	Vessel operations and port logistics	3	7,443	8,078	6,845
Road transport	Goods entering and leaving the port area by road or rail	3	735	829	802
Rail transport			122	148	150
Total			55,734	57,618	56,459



Figure 2 shows the relative importance of Scope 3 GHG emission sources from 2022 to 2024. Emissions come primarily from maritime operations for cargo (63.5%) and maritime operations for cruises (21.6%).

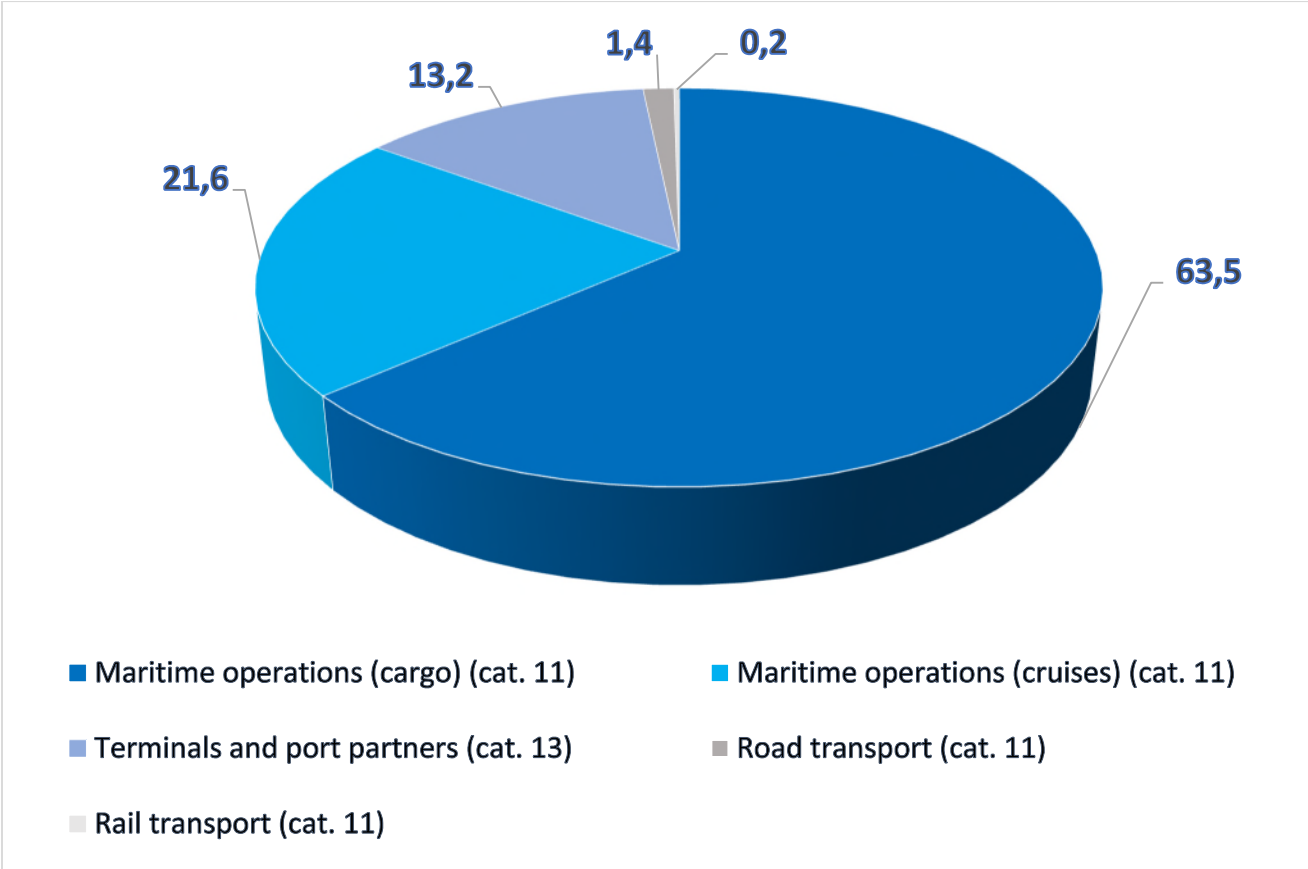


Figure2 : Relative importance of Scope 3 GHG emission sources from 2022 to 2024 (%)

5.2 DETAILS OF SCOPE 1 AND 2 EMISSIONS

Details of Scope 1 and 2 emissions are presented in Table 5. The main GHG emissions are attributable to fuel consumption (gasoline and diesel), as well as the use of natural gas for building heating.

Table5 : APQ Scope 1 and 2 GHGs (CO₂-eq.)

Scope	Emissions Sources	Direct activities	2022 CO ₂ -eq	2023 CO ₂ -eq.	2024 CO ₂ eq.	Average relative %
1	Natural gas	Building heating	188	130	170	36.6
	Gasoline	Patrol vehicles in the APQ territory, maintenance vehicles, and other vehicles in the APQ fleet, as well as small tools.	122	126	123	27.5
	Diesel	Off-road trucks, wheel loaders, material handling equipment, boats, straddle carriers, and emergency generators.	92	159	121	27.6
	Heating oil	Building heating	17	0 ⁴	0	1.2
	Fugitive emissions of refrigerants	Air conditioning systems in buildings, vehicles, and off-road equipment.	11	13	16	2.9
	Marine diesel	Boat	2	6	7	1.1
	Propane	Forklifts	1	1	1	0.2
2	Hydroelectricity	Heating, cooling, and lighting	13	13	13	2.9
Total			446	448	451	100

⁴ Conversion of the oil-fired heating system to an electric heating system.



6. CONCLUSION

Annual GHG inventories highlight the main sources of emissions within the Port of Québec's territory and enable tracking of their evolution over time. This exercise serves as an essential management and decision-making tool, guiding actions toward the most impactful levers for achieving targeted reduction goals. With a view to continuous improvement, the QPA intends to continue conducting these inventories, as well as efforts to enhance data quality.



