

HYDRO-QUÉBEC'S ELECTRICITY FACTS:

CO₂ Emissions and Hydro-Québec Electricity, 1990-2018

Hydro-Québec meets the energy needs of its customers almost entirely with hydroelectricity. The utility also purchases electricity from independent producers in Québec, elsewhere in Canada and the United States. These purchases include renewable energies (hydroelectricity, bioenergy and wind energy) as well as non-renewal energies (nuclear and thermal energy).

To calculate CO₂ emissions (kg/MWh) from all these sources of supply, Hydro-Québec uses the following emission factors:

- A zero emission factor for renewable and nuclear energy
- A specific factor for each thermal generating station and each supplier

This method excludes emissions from off-grid systems, which consist mainly of thermal plants. These off-grid systems supply communities that are too remote to be connected to our main grid.

The fluctuations in emission rate over the years are due to variations in our sources of supply. The highest emission rates are for years when production at our Tracy thermal generating station and our purchases from independent producers using fossil fuels were greatest. The Tracy plant stopped generating electricity in 2011.

YEAR	CO ₂ EMISSIONS* (kg/MWh)
1990	32.8
1991	13.3
1992	43.0
1993	18.6
1994	19.7
1995	15.3
1996	14.0
1997	6.2
1998	30.0
1999	16.9
2000	9.7
2001	14.2
2002	8.4
2003	21.1
2004	21.5
2005	12.0
2006	16.1
2007	21.4
2008	7.3
2009	4.8
2010	13.6
2011	6.5
2012	0.9
2013	1.1
2014	1.6
2015	1.0
2016	0.4
2017	0.6
2018	0.5

* Excluding off-grid systems

For more information, consult the data sheet entitled [Energy Supplies and Air Emissions](#) for the twelve-month period ended December 31, 2018.

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VERIFICATION STATEMENT

ELECTRICITY SUPPLY AND AIR EMISSIONS – HYDRO-QUÉBEC

Hydro-Québec retained GHD Consultants Limited (GHD) to undertake an audit of the Electricity Supply and Air Emissions fact sheet representing Hydro-Québec's electricity generation and purchases in 2018. This fact sheet targets and reports on the atmospheric emissions of oxides of nitrogen (NO_x), sulphur dioxide (SO₂) and greenhouse gases (as equivalent metric tons of CO₂), associated with the generation and purchase of electricity.

GHD has conducted the audit to a reasonable level of assurance, using the general principles outlined in ISO Standard 14064 Greenhouse Gases Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions (ISO 14064-3:2006). This standard outlines the verification principles to apply in order to ensure that greenhouse gas emissions reporting is complete, accurate, consistent, transparent and without material differences. Although the ISO standard only applies to greenhouse gas verification, these general principles were used for the verification of the NO_x and SO₂ atmospheric emissions reported. GHD is an accredited verification body and is recognized as an organization accredited to the ISO Standard 14065:2013 by a member of the International Accreditation Forum (IAF).

This fact sheet has been prepared by Hydro-Québec, based on its own collection of data gathered from numerous internal sources of information that have been corroborated and reviewed by Hydro-Québec's control methods and procedures. The energy mix chart illustrating the composition by type and energy source is obtained from Hydro-Québec's electricity generation and purchase activities, on its distribution network. Energy generated by off-grid power stations and energy from Hydro-Québec Production and purchased from independent producers for which Renewable Energy Certificates (RECs) have been sold or transferred to third parties, are excluded. Hydro-Québec's air emissions associated with the generation and purchase of electricity is also compared with regional averages reported by its counterparts in other provinces and states, based on third-party information.

GHD's responsibility is to determine whether the reported emissions are accurately represented and whether errors, omissions or discrepancies, once aggregated, are below the materiality threshold. The audit methods used by GHD include, but are not limited to, comparing input values with raw data, recalculating emissions and where applicable, applying sensitivity analysis to assess data integrity and reliability.

The supporting evidence is satisfactory and there is no material discrepancy. GHD can affirm that the evidence obtained during the verification served to conduct the audit to a reasonable level of assurance. There is no restriction (qualification or limitation) applicable to GHD's opinion.

Montreal, June 14, 2019

Gordon Reusing, P. Eng.
GHD Principal