



# Clean energy to power us all

Sustainability  
report 2018





# How to use this report

## INTERACTIVITY

This report, presented in PDF format, has interactive features made possible by Adobe Reader software.

## FEATURES

*Additional information on the Web*

*Exclusive Web content*

*Additional or more detailed information*

*Access to a map locating a project*

*Tip for accessing further information*

Global Reporting Initiative  
*Hyperlink*

*Hyperlink to another page in the report*

Electricity supplied  
*Term defined*

**Cover:** Outardes-4 generating station is part of the Manic-Outardes complex built in the 1960s in the Côte-Nord region. Québec hydropower is a decarbonized, low-cost, readily exportable energy source.

## GRI (Global Reporting Initiative)

In this report, the indicators under the different section titles refer to GRI disclosures.

## NAVIGATION

*Go to previous or next page*

*Previous view*

*Go to Table of contents*

*Access bookmarks*

HYDRO-QUÉBEC // SUSTAINABILITY REPORT 2018 // ENHANCING CORPORATE GOVERNANCE AND REMAINING AN EMPLOYER OF CHOICE

### ENHANCING CORPORATE GOVERNANCE AND REMAINING AN EMPLOYER OF CHOICE

The sense of pride in working for the company is widespread among employees (Romaine-4 jobsite)

IN THIS SECTION	SOLUTIONS CONSIDERED AND EXAMPLES OF INITIATIVES TO BE IMPLEMENTED BY 2025	MATERIALITY ANALYSIS ASPECTS	STAKEHOLDERS CONCERNED
Like other companies, Hydro-Québec has to transform its corporate culture, which has always been rooted in prudence and driven by in-house resources, to a customer-centered culture that is more agile and open to new ideas. The company must continue to be a source of pride for its employees, its customers and Québec society as a whole. To that end, it relies on the know-how of employees who work to meet today's needs as well as those of tomorrow.			
<b>IN THIS SECTION</b> <ul style="list-style-type: none"> <li>&gt; Governance structure</li> <li>&gt; Sustainability governance activities</li> <li>&gt; Championing women and diversity</li> <li>&gt; Participation in international organizations and associations</li> <li>&gt; Régie de l'énergie</li> </ul>			
<ul style="list-style-type: none"> <li>&gt; Access to information and protection of personal information</li> <li>&gt; International influence and cooperation</li> <li>&gt; Employee and contractor health and safety</li> </ul>			

**565** ✓

ACCESS TO INFORMATION REQUESTS

**85%** ✓

SUSTAINABLE ENGAGEMENT INDEX

UN SUSTAINABLE DEVELOPMENT GOAL AND TARGETS ASSOCIATED WITH THIS CHALLENGE

**8** RECENT WORK AND ECONOMIC GROWTH

SEE TARGETS



## Our approach

Supplying clean, renewable energy helps ensure quality of life. Meeting people's electricity needs in a sustainable way is of prime importance. It is also crucial to use resources wisely and preserve the quality of the environment for future generations. Québec long ago opted for hydroelectricity, a clean, renewable energy source with known, well-controlled environmental impacts. Today, Québec is actively involved in the fight against climate change in North America.

Hydro-Québec has a sustainability vision that goes well beyond the environment. We endeavor to see that stakeholders participate in our decisions. We are also determined to contribute to the province's economic vitality.



# Our priorities

Our mission is to deliver reliable electric power and high-quality services. By developing hydraulic resources, we can achieve this while contributing to collective wealth and playing a part in the emergence of a low-carbon economy.

Climate change, the energy industry, our business environment and our future aspirations all involve major challenges. Seven of these are directly related to sustainability.

**OUR MAIN  
SUSTAINABILITY  
CHALLENGES**

GRI GRI 102-1, GRI 102-2, GRI 102-4, GRI 102-6, GRI 102-7, GRI 102-8, EU1, EU4

# Hydro-Québec in 2018

## OUR SYSTEM



**37,310 MW** ✓

Installed capacity of the generating fleet



**532** ✓

Number of substations



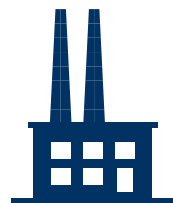
**63** ✓

Number of hydroelectric generating stations



**118,130 km** ✓

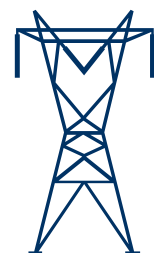
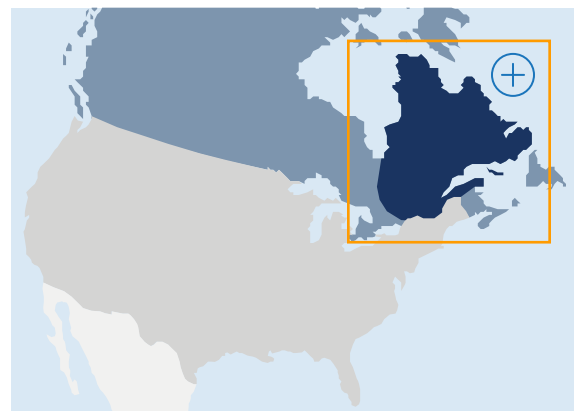
Length of the medium-voltage distribution system



**24** ✓

Number of thermal generating stations

Map of major facilities and generating stations serving off-grid systems



**34,361 km** ✓

Length of the transmission system



## OUR HUMAN RESOURCES



**19,904** ✓

Number of employees

**45 years** ✓

Average age



**28.8%** ✓

Proportion of women



**1,457** ✓

New employees



**936** ✓

Retirements



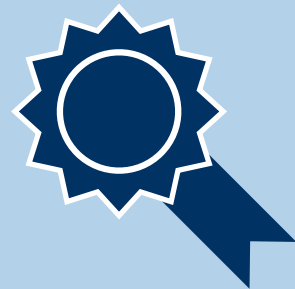
**250** ✓

Number of internships





# Noteworthy in 2018



## CORPORATE KNIGHTS

Hydro-Québec was recognized as Canada's best corporate citizen in the 2018 ranking by *Corporate Knights* magazine. A total of 232 Canadian companies with sales of more than \$1 billion were evaluated on the basis of 17 environmental, social and governance criteria.

## PREVENTIVE SPILLS

In spite of careful water-system management, preventive spills are sometimes necessary. In 2018, spills were carried out at the following generating sites: Manic-1, Manic-2, Manic-3, Péribonka, La Grande-1, Brisay, Eastmain-1 and Laforge-2. The goal is to slow down reservoir filling in order to allow new inflows to be received as well as to minimize environmental impacts.

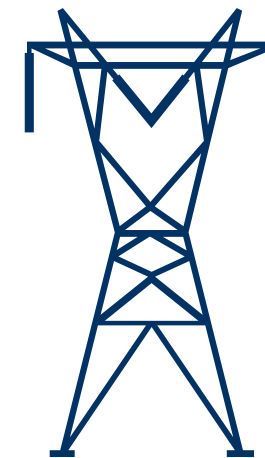


## CONNECTION OF THE ÎLES-DE-LA-MADELEINE TO THE MAIN GRID

Hydro-Québec decided to connect the islands to the main grid in the Gaspésie region via an underwater link that will be commissioned in 2025 and will substantially reduce the company's greenhouse gas emissions.

## RECORD VOLUME OF EXPORTS

Our net exports of electricity reached a record volume of 36.1 TWh, which yielded profits of \$744 million, or 23% of the company's net income. Through its net electricity exports, Hydro-Québec helped avoid approximately 8 Mt CO<sub>2</sub> eq.—equivalent to annual emissions from 2 million vehicles.



## THE LARGEST EXPORT CONTRACT IN OUR HISTORY

Hydro-Québec secured a contract to sell 9.45 TWh annually to Massachusetts, which will have a supply of clean energy for 20 years starting in 2022 once the contract is signed. The company had presented [six options](#)—three of them for a hydro-wind supply blend. Over the term of the contract, more than 36 Mt CO<sub>2</sub> eq. in emissions will thus be avoided.

# Message from the President and Chief Executive Officer



Éric Martel  
President and Chief Executive Officer

## ON A ROLL

In 2018, the energy surpluses that built up behind our dams obliged us to spill large quantities of water. The explanation for this situation is that the markets are unable to instantly absorb all the energy contained in our huge reservoirs. In the 1980s, Hydro-Québec experienced a similar period of even more abundant surpluses after the generating stations in phase one of the La Grande complex in the Baie-James region were commissioned.

The good news is that our energy surpluses offer us highly lucrative business opportunities on markets in neighboring provinces and states. We can already report tangible results in this regard. Last spring, we signed the largest electricity export contract in our history. The reason for this is simple: Québec hydropower is reliable and affordable. Above all, it is very clean: according to the Massachusetts Department of Energy Resources, the greenhouse gas emissions avoided over the term of the contract will total more than 36 Mt CO<sub>2</sub> eq.

## A CRUCIAL NORTH AMERICAN ENERGY SOURCE

Our energy surpluses, coupled with unbeatable sales arguments, allow us to see ourselves becoming a crucial source of clean energy in northeastern North America. This is a key component in achieving the objective of our Strategic Plan, which aims to “lay the groundwork to double our revenue over the next 15 years so as to increase profits.” Other growth avenues will also play a part. To generate even more wealth, we will be on the lookout for growth opportunities in Québec and abroad, while also continuing to commercialize our technological innovations.

To fulfill all these ambitions, we have a major advantage: exceptionally competent, motivated employees and partners. We must take good care of them. That is why we’ve embarked on a thorough change in occupational health and safety culture. We want this culture to be firmly rooted, consistent and suited to the reality of our company. Last year, more than 9,000 employees and managers took a 90-minute time-out to familiarize themselves with our new Statement of Occupational Health and Safety Principles. Accident frequency was 2.01, versus a targeted 1.70. Accordingly, much remains to be done, and further concrete steps will be taken; a specific action plan has been established to improve our performance in this area. I’m convinced that our actions will already begin to bear fruit in 2019.



## QUÉBEC: THE CENTRAL FOCUS OF OUR BUSINESS

While some growth avenues are outward-looking, our primary customer base—Québec—remains the central focus of our concerns and our business strategy. In the past few years, we've introduced many initiatives to improve customer satisfaction. Overall public satisfaction with Hydro-Québec is on the rise, customers' wait time is declining and the range of services we offer our various customer categories is continually expanding. The customer-focused shift we've adopted is fully in line with our rate commitments. For the fourth year in a row, we kept rate increases below the level of inflation.

Québec customers first, but also the Québec environment. Even though our environmental management system has been certified ISO 14001:2015-compliant, we have to stay on the ball. Some issues have been raised in connection with the 120-kV Grand-Brûlé–Saint-Sauveur supply line being built. Despite all our efforts, the project's environmental management has proven difficult. We have learned from this situation and are committed to taking all necessary measures to avoid any recurrence.

## TOWARD A LOW-CARBON ECONOMY

While our electricity exports help avoid GHG emissions in neighboring states, we're also maintaining our efforts to reduce our own emissions here in Québec. Since 1990, Hydro-Québec's emissions have fallen by over 90%. We're on the same track with our project for an underwater link to the Îles-de-la-Madeleine and our requests for proposals for the conversion of off-grid systems to renewable energies. On a wider scale, we're implementing more and more initiatives to speed up the decarbonization of the Québec economy.

Under the company's Technological Vision 2035, our innovation projects will revolve around our customers, our assets and the power system of the future. These projects will diversify our service offering and usher in a new era of electrification that will allow each of our customers to contribute to the decarbonization of Québec.

**Éric Martel**

**President and Chief Executive Officer**





**GRI** GRI 102-9, GRI 102-40, GRI 102-42, GRI 102-43

# Mutually beneficial relations

Owing to the nature of our operations, we have a presence throughout the province and we maintain ongoing relations with our numerous stakeholders. Good dialogue enables us to preserve trust, obtain support for important activities and even occasionally reconcile diverging interests. The Sustainability Report is intended to provide honest, transparent information to our stakeholders, with whom we maintain mutually beneficial relations.

 Click on each stakeholder group's illustration for examples of shared sustainability goals.



**Customers**



**Employees**



**Educational institutions**



**Unions**



**Nongovernmental organizations**



**General public**



**Local and Indigenous communities**



**Investors**



**Government authorities**



**Suppliers**



**GRI** GRI 102-12, GRI 102-45, GRI 102-49, GRI 102-50, GRI 102-52

# About this report

The *Sustainability Report 2018* describes Hydro-Québec's performance with respect to its main environmental, social, economic and governance issues. This edition, published in May 2019, is the seventeenth such report produced by Hydro-Québec.

## NEW FEATURES

- › Following the materiality analysis exercise conducted in the fall with various external and internal stakeholders, new presentation of information organized around seven main sustainability challenges.
- › Addition of the *Communication on Progress* section to fulfill the requirements of the UN Global Compact further to Hydro-Québec's renewed engagement. (p. 84)



## SCOPE

The *Sustainability Report 2018* mainly addresses the issues and impacts of Hydro-Québec's activities in Québec from January to December 2018.

## COMMUNICATION TOOLS

To reach the largest possible number of stakeholders, Hydro-Québec employs various tools for communicating and reporting on its sustainability.

- › *Sustainability Report 2018*
- › A leaflet presenting 2018 sustainability highlights
- › [Sustainable development Web site](#)
- › [Sustainable Development Action Plan 2015–2020](#)
- › [Annual Report 2018](#)
- › [Biodiversity Performance Report](#)
- › [Videos](#)
- › Presentations at various events (exhibitions, [universities](#), conferences, symposiums, etc.)

## APPLICATION OF RECOGNIZED STANDARDS

Stakeholders expect Hydro-Québec's Sustainability Report to be complete, and that the information presented be accurate, balanced and transparent. This report has therefore been prepared in accordance with the Global Reporting Initiative (GRI) Standards: Core option. The Electric Utilities Sector Supplement has also been used. These standards ensure the credibility and quality of sustainability reporting. Readers can consult the partial GRI index on page 88 of this report or the complete index in the [Global Reporting Initiative](#) section of Hydro-Québec's Web site.


The information contained in this report has been carefully gathered and validated internally. In addition, an outside firm conducted an independent evaluation of some quantitative data and verified compliance with the [AccountAbility AA1000 APS \(2018\)](#) principles. Verified data are accompanied by the symbol ✓. An independent assurance statement is supplied on page 93.

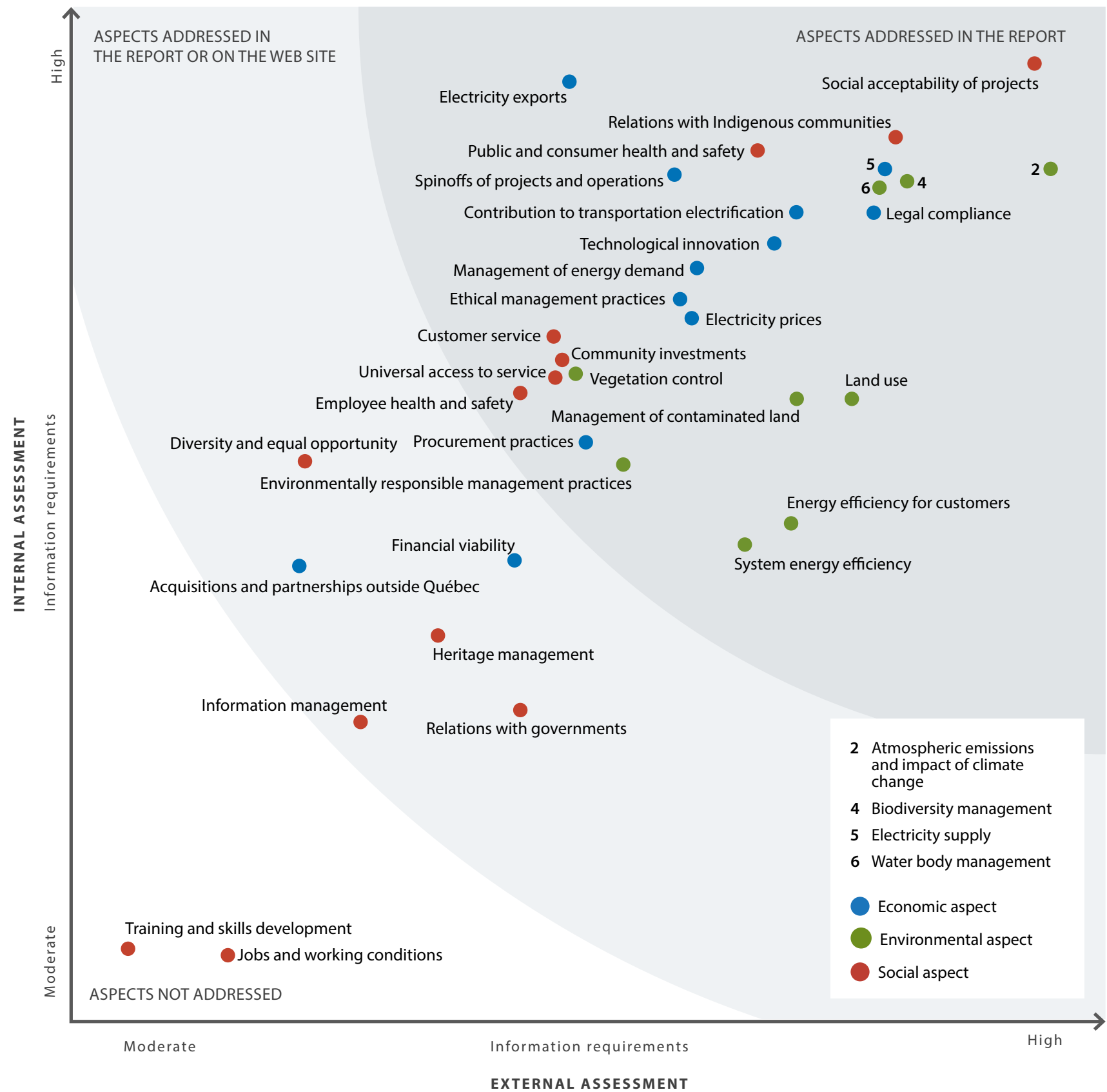


**GRI** GRI 102-42, GRI 102-43, GRI 102-44, GRI 102-46, GRI 102-47, GRI 102-49, GRI 103-1

# Materiality analysis

The materiality analysis is used to determine the content of the Sustainability Report. This ensures that the report covers the topics that are of the greatest materiality as regards our business environment, the nature of our projects and operations, and their economic, environmental and social impacts. This exercise cannot be performed without the participation of both internal and external stakeholders. We conducted a materiality analysis in 2011, 2014 and 2017.

 **Click on an aspect to find out its scope.**



 **REVIEW OF STAKEHOLDER RESPONSIVENESS EXERCISE**



**GRI** GRI 102-2, GRI 102-15, GRI 102-45, EU1, EU3, EU4, GRI 103-1, GRI 103-2, GRI 201-1, GRI 203-2

# Value chain




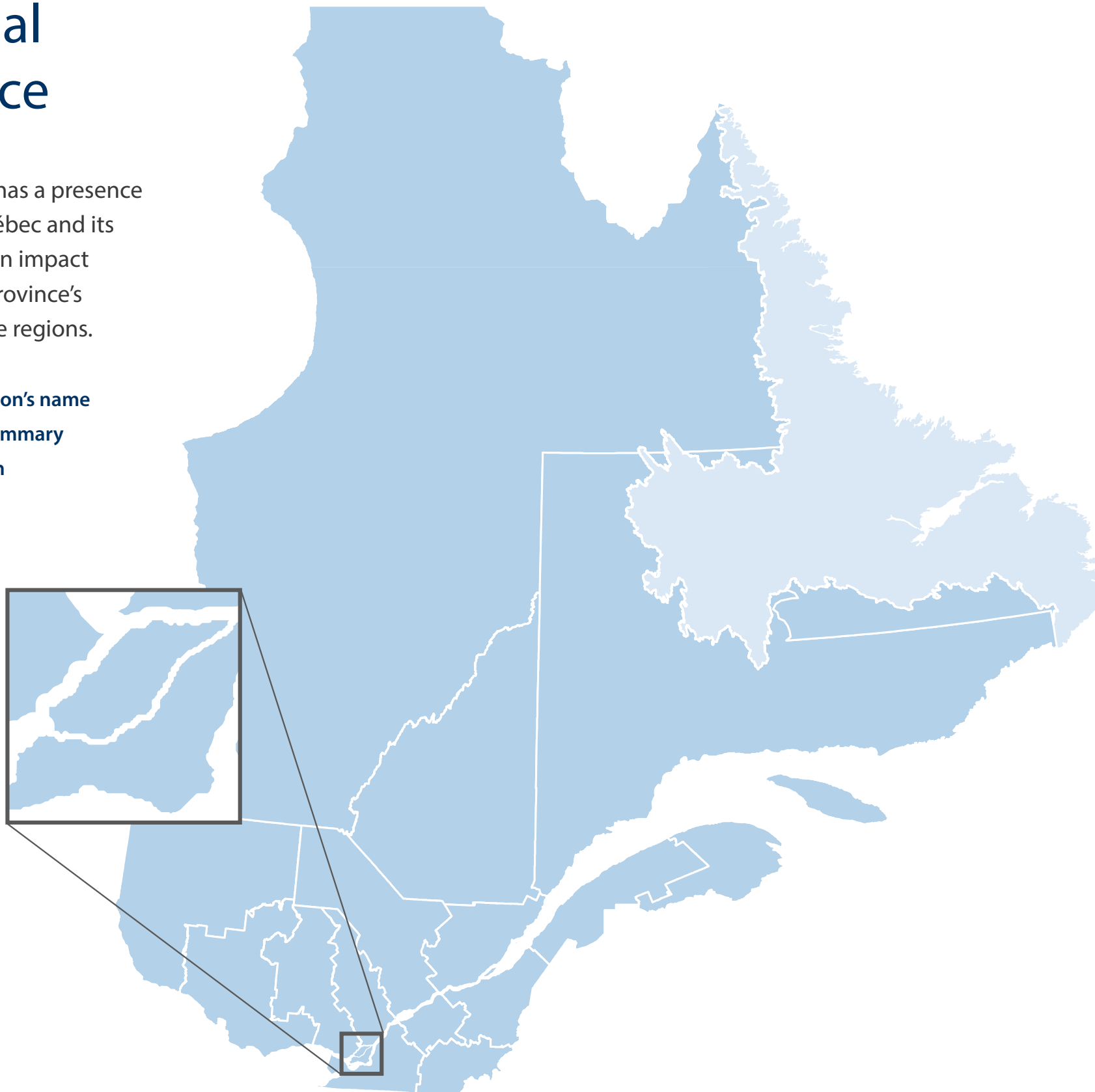


**GRI** GRI 102-2, GRI 102-4, GRI 102-6, GRI 102-7, GRI 102-8, EU1, EU3, EU4, GRI 103-1, GRI 103-3, GRI 201-1, GRI 204-1, GRI 413-2

# Regional presence

Hydro-Québec has a presence throughout Québec and its activities have an impact in each of the province's 17 administrative regions.

 **Click on a region's name to view the summary for that region**





**GRI** GRI 102-7, GRI 102-15, EU2, GRI 103-2, GRI 103-3, GRI 302-4, GRI 303-1, GRI 305-1, GRI 305-5, GRI 305-7, GRI 306-3, GRI 307-1

# Performance metrics

INDICATORS	RESULTS				TARGETS	
	2015	2016	2017	2018	2018	2020
<b>ENVIRONMENT</b>						
Net electricity generated by Hydro-Québec (GWh)	170,900	172,278	177,091	175,545 ✓		
Total net electricity generated and purchased (GWh)	217,148	216,840	221,097	225,439 ✓		
Renewable energy/total energy generated and purchased— (%)	99.3	99.7	99.5	99.6 ✓		
GHG emissions from thermal electricity generation (t CO <sub>2</sub> eq.)	232,424	227,249	227,936	234,441 ✓		
SO <sub>2</sub> emissions from thermal electricity generation (t)	1,040	979	1,008	1,180 ✓		
NO <sub>x</sub> emissions from thermal electricity generation (t)	4,349	4,292	3,991	4,124 ✓		
GHG emissions from vehicle fleet (t CO <sub>2</sub> eq.)/ total number of vehicles as at December 31	53,000/5,390	51,571/5,229	51,063/5,174	51,785 ✓/5,236 ✓		
GHG emissions from light-vehicle fleet (t CO <sub>2</sub> eq.)	25,322	22,852	21,532	21,215 ✓	24,590	24,302
Hybrid and plug-in light vehicles as at December 31 (number)	105	98	150	294 ✓	250	500
Energy efficiency initiatives: energy saved (GWh)	570	534	524	455 ✓		
Accidental releases of contaminants reported to the authorities (number) <sup>a</sup>	910	937	1,143	1,262 ✓		
Environmental noncompliance notices (number)	31	43	45	26 ✓		
Insulating oil recovered (thousands of litres)/ reused (%)	3,607/93.3	3,632/87.9	4,110/95.8	5,563/96.2 ✓		
Water withdrawn (millions of m <sup>3</sup> ) <sup>b</sup>	79	39	45	9 ✓		
Area of transmission line rights-of-way treated mechanically (%)	94	98	95	95 ✓		
Area of dikes and dams treated mechanically (%)	56	51	52	46		
Distribution system length (km)/ underground lines (%)	116,258/11.4	116,794/11.6	117,747/11.8	118,130 ✓/12 ✓		
<b>SOCIAL</b>						
Overall public satisfaction – very and somewhat satisfied (%)	82	91	92	93 ✓	≥ 90	≥ 90
Customer satisfaction index – Combined index (scale of 10) <sup>c</sup>	s. o.	8.1	8.2	8.2 ✓	8.2	s. o.
Average call wait time (customer relations centers) (seconds)	231	99	84	87 ✓	≤ 110	≤ 110

a) An awareness campaign was conducted for employees and outside suppliers in 2017. The increased number of spills is attributable to the fact that this indicator previously did not count certain spills. Over 80% of spills are smaller than 25 litres.

b) According to the *Regulation Respecting the Declaration of Water Withdrawals*, which applies to thermal generating stations and some workcamps using more than 75 m<sup>3</sup> of water per day (excludes withdrawals for PPG Canada).

c) New method applied starting in 2016.



GRI GRI 102-7, GRI 102-15, GRI 103-2, GRI 103-3, GRI 203-2, GRI 403-2, EU29

## Performance metrics

INDICATORS	RESULTS				TARGETS	
	2015	2016	2017	2018	2018	2020
<b>SOCIAL (cont'd)</b>						
System average interruption duration index (SAIDI) – distribution system (min/customer)	195	338	278	411 ✓		
System average interruption duration index (SAIDI) – transmission system (min/customer)	18	34	44	26 ✓		
Special payment arrangements for low-income customers (number)	95,437	97,879	106,438	92,882 ✓		
Customer complaints and claims (number)	9,727	7,517	6,211	6,771 ✓		
Total permanent and temporary workforce as at December 31	19,794	19,552	19,786	19,904 ✓		
Employee sustainable engagement index (%) <sup>d</sup>				85 ✓		
Work-related accident frequency (per 200,000 hours worked) <sup>e</sup>	–	–	2.00	2.01 ✓	1.70	1.11
Percentage of payroll invested in training	3.0	2.7	3.1	3.1 ✓		
Funding and financial commitments – Integrated Enhancement Program (number of initiatives/\$M)	16/1.6	25/3.0	27/4.2	22/3.3 ✓		
Fondation Hydro-Québec pour l'environnement (number of projects funded/\$'000)	16/964	18/971	16/738	12/765 ✓		
Donations and sponsorships (\$M) <sup>f</sup>	16.8	17.5	19.1	19.1		
<b>ECONOMY</b>						
Electricity sales in Québec (TWh)	171.3	169.2	170.7	172.8 ✓		
Revenue from electricity sales inside and outside Québec (\$M)	13,362	13,199	13,414	13,865		
Rate increases (%) <sup>g</sup>	2.9	0.7	0.7	0.3	≤ CPI	≤ CPI
Net income (\$M)	3,147	2,861	2,846	3,192	2,475	2,850
Dividend (\$M)	2,360	2,146	2,135	2,394	1,856	2,138
Water-power royalties (\$M)	660	673	701	705		
Total procurement of goods and services (\$M)/ Québec only (%)	3,050/93	2,952/94	3,170/92	2,883/91		
Public utilities tax (\$M)	268	284	284	298		
Municipal and school taxes (\$M)	37	40	38	39		
Funding for educational institutions – Contributions, research chair funding and research contracts (\$M) <sup>h</sup>	7.9	8.4	7.1	7.8 ✓		

d) Revised in 2018, the survey now titled *Notre énergie, notre engagement* presents results that cannot be compared with those of previous years since they were established on new bases.

e) Since January 2018, the company has recorded accidents involving loss of time and temporary assignment. Previous years' figures can therefore not be compared, with the exception of those for 2017, which have been recalculated using the new method.

f) Includes Hydro-Québec's donation to Centraide.

g) Except for Rate L.

h) 2018 figure includes \$3.17 million recorded as donations and sponsorships. ✓



# Our contribution to sustainable development goals

The 17 sustainable development goals of the [United Nations Development Programme](#) were adopted by world leaders in the fall of 2015 and took effect January 1, 2016. These goals build on the successes of the Millennium Development Goals, while including new priorities, such as climate change and energy efficiency.

Hydro-Québec intends to do its part by pursuing the goals most relevant to its industry and its projects. The [17 goals have 169 targets](#) that demonstrate the scope and ambition of the new program. The goals and targets provide guidance for initiatives to be carried out by 2030 in the fields most important to humanity and the planet.

The company has assessed the various goals and its potential contribution to achieving each of them. It has accordingly selected four goals and nine targets which it plans to make its particular focus. These goals and targets are presented in the first pages of the following sections.

## SUSTAINABLE DEVELOPMENT GOALS

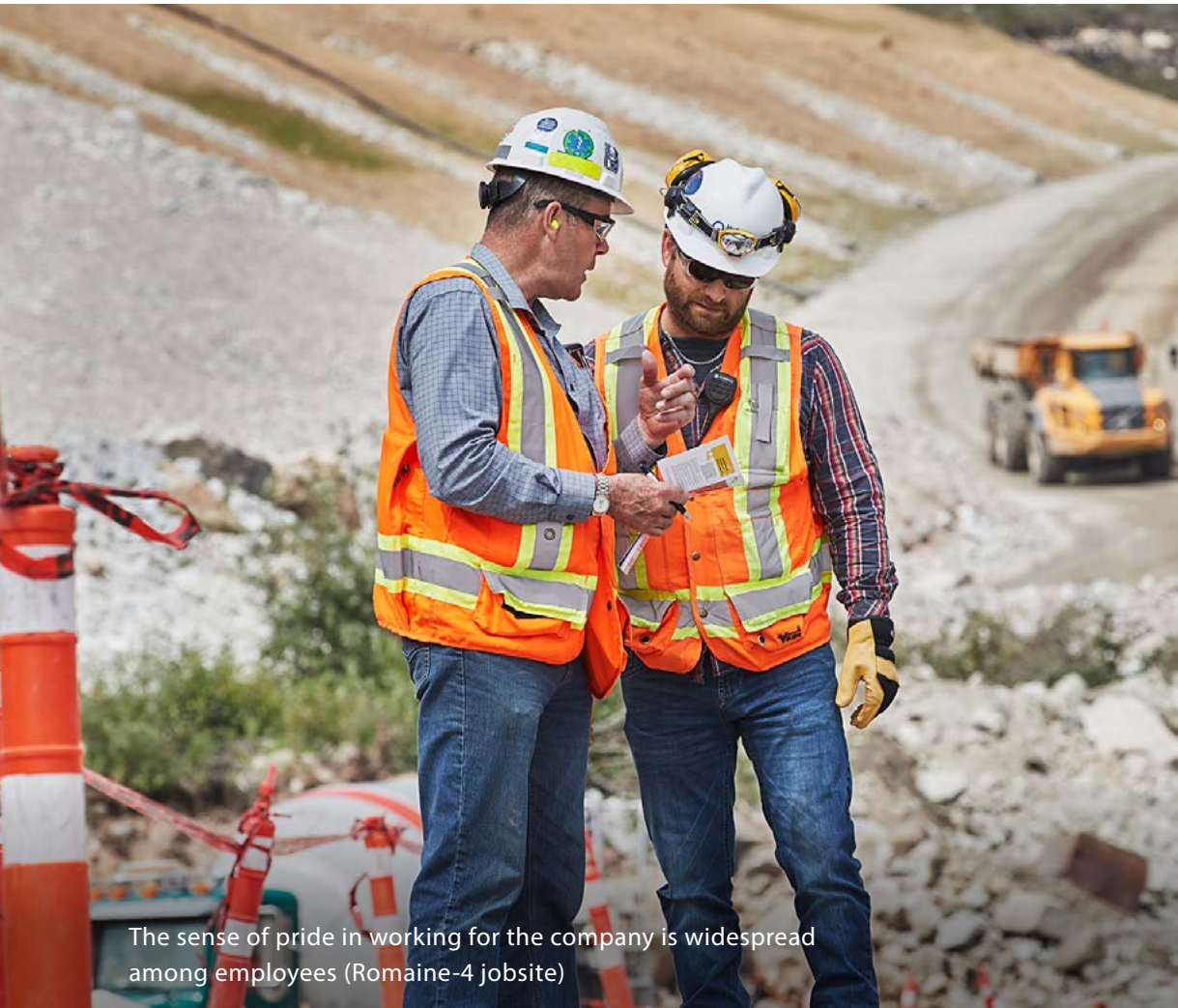
Hydro-Québec plans to contribute by incorporating goals 7, 8, 11 and 13, which are the most relevant to its industry and its projects.





**GRI** GRI 102-40, GRI 102-42, GRI 102-44, GRI 102-47, GRI 103-1, GRI 103-2

# ENHANCING CORPORATE GOVERNANCE AND REMAINING AN EMPLOYER OF CHOICE



The sense of pride in working for the company is widespread among employees (Romaine-4 jobsite)

IN THIS SECTION	SOLUTIONS CONSIDERED AND EXAMPLES OF INITIATIVES TO BE IMPLEMENTED BY 2025	MATERIALITY ANALYSIS ASPECTS	STAKEHOLDERS CONCERNED
-----------------	--	------------------------------	------------------------

Like other companies, Hydro-Québec has to transform its corporate culture, which has always been rooted in prudence and driven by in-house resources, to a customer-centered culture that is more agile and open to new ideas. The company must continue to be a source of pride for its employees, its customers and Québec society as a whole. To that end, it relies on the know-how of employees who work to meet today's needs as well as those of tomorrow.

## IN THIS SECTION

- > Governance structure
- > Sustainability governance activities
- > Championing women and diversity
- > Participation in international organizations and associations
- > Régie de l'énergie
- > Access to information and protection of personal information
- > International influence and cooperation
- > Employee and contractor health and safety



**565** ✓

⊕ ACCESS TO INFORMATION REQUESTS

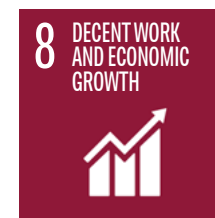


**85%** ✓

⊕ SUSTAINABLE ENGAGEMENT INDEX



UN SUSTAINABLE DEVELOPMENT GOAL AND TARGETS ASSOCIATED WITH THIS CHALLENGE



⊕ SEE TARGETS



**GRI** GRI 102-12, GRI 102-13, GRI 102-16, GRI 102-18, GRI 102-22

# Governance structure

## OUR SOLE SHAREHOLDER: THE QUÉBEC GOVERNMENT

The major priorities adopted by the Québec government—mainly through its Energy Policy and Sustainable Development Strategy—have a direct impact on the planning of all our activities. In addition, Hydro-Québec works closely with the new government agency Transition énergétique Québec, which tabled its master plan during the year.



 QUÉBEC ENERGY POLICY

 QUÉBEC SUSTAINABLE DEVELOPMENT STRATEGY

 TRANSITION ÉNERGÉTIQUE QUÉBEC'S 2018–2023 MASTER PLAN

## SUSTAINABILITY GOVERNANCE





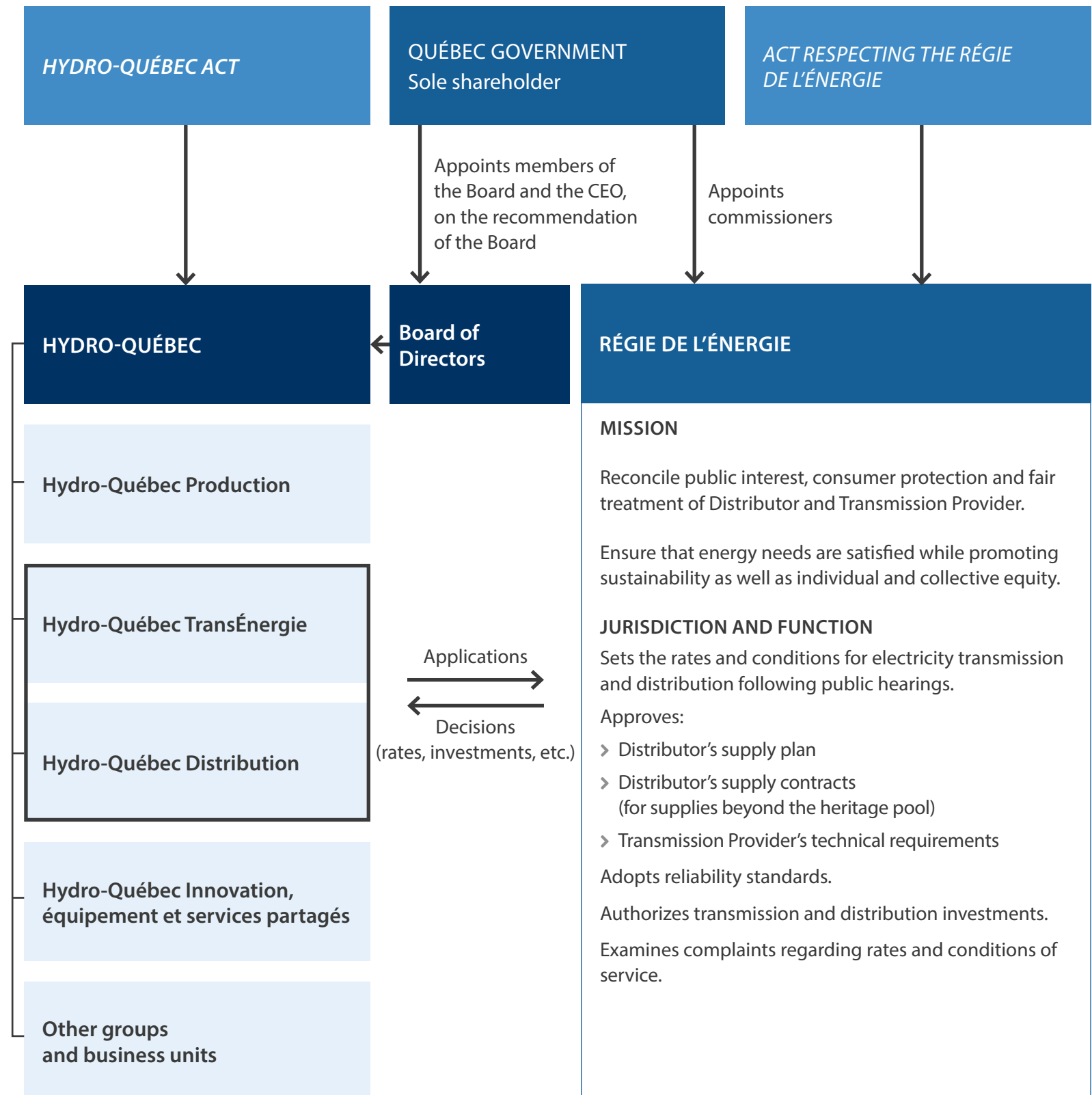
**GRI** GRI 102-18, GRI 102-22, GRI 102-24

## RÉGIE DE L'ÉNERGIE

As the economic regulatory body of Québec's energy industry, the [Régie de l'énergie](#) approves the rates and conditions for electricity transmission and distribution, authorizes transmission and distribution investments and handles complaints concerning electricity rates and service conditions. The Régie is financed by the fees and royalties paid by regulated bodies, with the bulk of its funding provided by Hydro-Québec.

Over the year, the company filed a number of applications with the Régie, including transmission and distribution rate applications, an application regarding the introduction of a public electric-vehicle charging service and an application to set the rates and service conditions for using cryptography as applied to blockchains. It also submitted various capital projects involving transmission and distribution systems.

## ELECTRICITY REGULATION IN QUÉBEC



**MISSION**

Reconcile public interest, consumer protection and fair treatment of Distributor and Transmission Provider.

Ensure that energy needs are satisfied while promoting sustainability as well as individual and collective equity.

**JURISDICTION AND FUNCTION**

Sets the rates and conditions for electricity transmission and distribution following public hearings.

Approves:

- > Distributor's supply plan
- > Distributor's supply contracts (for supplies beyond the heritage pool)
- > Transmission Provider's technical requirements

Adopts reliability standards.

Authorizes transmission and distribution investments.

Examines complaints regarding rates and conditions of service.



**GRI** GRI 102-16, GRI 102-18, GRI 102-22, GRI 102-23, GRI 102-24, GRI 102-32

## BOARD OF DIRECTORS

As at December 31, 2018, Hydro-Québec’s Board of Directors had 15 members—nine women and six men—who hailed from a wide range of professional backgrounds. The Board consists of 13 independent directors, along with the President and CEO and the Deputy Minister of Energy and Natural Resources. Under the Act respecting the governance of state-owned enterprises, the Board must have at least one member who is 35 years of age or less at time of his or her appointment.

The Board of Directors also adopts [policies](#) and [codes of conduct](#) that guide the company’s operations and the actions of all its employees.



### 2018 HIGHLIGHTS

- A new Chair of the Board of Directors was appointed.
- As recommended by various committees, the company’s full slate of [policies](#) were reviewed.

### COMMITTEES OF THE BOARD OF DIRECTORS

### EXPERTISE AND EXPERIENCE PROFILES OF BOARD MEMBERS

## MAIN SUSTAINABILITY GOVERNANCE ACTIVITIES

 Performance reporting  Accountability





**GRI** GRI 102-12, GRI 102-18

## NEW CORPORATE MANAGEMENT SYSTEM (CMS)

In 2018, Hydro-Québec pursued its efforts to adapt to changes in its business environment. Actively engaged since 2016 in transforming our corporate culture, processes and procedures, we are working to establish two-way internal communications to ensure that information is shared more quickly and efficiently across the organization.

To achieve our goals, we have adopted continuous improvement practices and behaviors by putting in place a new corporate management system (CMS). One of the CMS's components is a daily meeting held at every

management level. At this meeting, managers and their teams come together to review a dashboard covering the following aspects: health, safety and environment first, followed by customers, employees, productivity, financial results and stakeholders.

These six aspects reflect the company's priorities and stem from the strategies adopted in the [Strategic Plan 2016–2020](#).

## A SINGLE ENVIRONMENTAL MANAGEMENT SYSTEM

Some 20 years ago, Hydro-Québec introduced various ISO 14001-compliant environmental management systems (EMS), each of which was

associated with a specific business unit. As a result of the recent introduction of the CMS and the adoption of ISO 14001:2015 (the most recent version), we were able to institute a single EMS that replaces the seven systems previously in use.

In June 2018, Hydro-Québec received its ISO 14001:2015 certification. This standard applies to all company operations, except those of its subsidiaries and the Gentilly-2 facilities currently being decommissioned. This certification confirms the company's application of sound environmental management practices.

### ⊕ PILLARS OF CORPORATE CHANGE

### SIX ASPECTS, SIX PRIORITIES



#### Health, safety and environment

Before undertaking any activities, employees must be in good health and have a safe and secure working environment.



#### Customers

Supported by healthy employees working in a safe and secure environment, the company is able to deliver quality services to its customers in a timely manner.



#### Employees

To continuously improve its performance, the company relies on the expertise and engagement of its employees. It ensures that they receive the training, professional development and tools they need to improve their skills throughout their careers.



#### Productivity

To ensure optimal performance, the company improves on its processes and procedures on a daily basis and manages all its resources (human, financial and material) diligently.



#### Financial results

In the final analysis, it is by paying attention to all these aspects that Hydro-Québec is able to deliver excellent financial results.



#### Stakeholders

This aspect involves monitoring and measuring the company's impact on a range of stakeholders, including municipalities, citizens' associations, political representatives, the news media and so on.



**GRI** GRI 102-12, GRI 102-18

## ANTI-CORRUPTION MANAGEMENT

Hydro-Québec is an engine of the Québec economy, whether through its role as a property owner, its acquisitions of goods and services or its presence in every region of the province. It is in that capacity that we are taking part in a Québec government pilot project to implement ISO 37001:2016, which concerns the establishment of an anti-corruption management system. This standard provides guidance to help organizations prevent, detect and fight corruption. The company plans to obtain certification by 2020. As in the case of the EMS, the various mechanisms put in place will be harmonized with the CMS.

### 2018 HIGHLIGHTS

➤ Measures were implemented to prepare for adoption of the anti-corruption standard. They included strengthening the *Supplier Code of Conduct* and requiring all bidders to submit a declaration regarding conflicts of interests.

## ACCESS TO INFORMATION AND PROTECTION OF PERSONAL INFORMATION

In accordance with the *Regulation respecting the distribution of information and the protection of personal information*, Hydro-Québec publishes information that is of public interest on its [Web site](#).

### 2018 HIGHLIGHTS

- Employees were reminded of the principles governing access to documents and the protection of personal information through various communications and training sessions, as well as in the context of specific cases.
- A total of 565 access-to-information requests ✓ concerning administrative documents or personal information were submitted, compared to 428 in 2017; 182 were granted in full, 233 were granted in part and 80 were denied . The company was unable to fulfill the remaining 70 requests because it did not have the requested document, the request was withdrawn or the information concerned another public body.
- In addition, two cases involving the loss or theft of customers' personal information were handled with all due care. In both cases, steps were taken to ensure that it did not happen again.

## A NEW ECONOMIC INTEGRITY TEAM

Created in 2018, our first economic integrity team conducts investigations with the aim of preserving the company's income. The team consists of eight investigators and managers with experience in investigations, contract management, law, criminology and administration. A second team will be formed in 2019.

Every year, Hydro-Québec awards some \$3 billion in contracts to numerous suppliers of goods and services. Since schemes involving collusion, corruption and misconduct continue to evolve, the company must refine its methods in order to prevent and detect theft and fraud and recover any sums it is owed.

While this approach is primarily preventive in nature, the team has opened some 80 files thus far and recovered over \$1 million.



**GRI** GRI 102-11, GRI 403-2

# An employer of choice

## EMPLOYEE AND CONTRACTOR HEALTH AND SAFETY

Hydro-Québec endeavors to protect the people who work on its behalf. Even though the occupational health and safety standards we apply are very stringent, we decided to undertake a major cultural change following a review of our processes and procedures in this area.

A major finding emerged from that review: our health and safety culture lacked consistency and a strong foundation and was ill suited to Hydro-Québec workplace realities.

Certain tragic events and an accident frequency that had stagnated since 2010 reinforced the desire to instill an occupational health and safety culture that fosters inter-employee solidarity.

 **2018 HIGHLIGHTS**

➤ [A Statement of Occupational Health and Safety Principles](#) was drafted in cooperation with the joint committees and over 400 employees, managers and union partners. This statement is

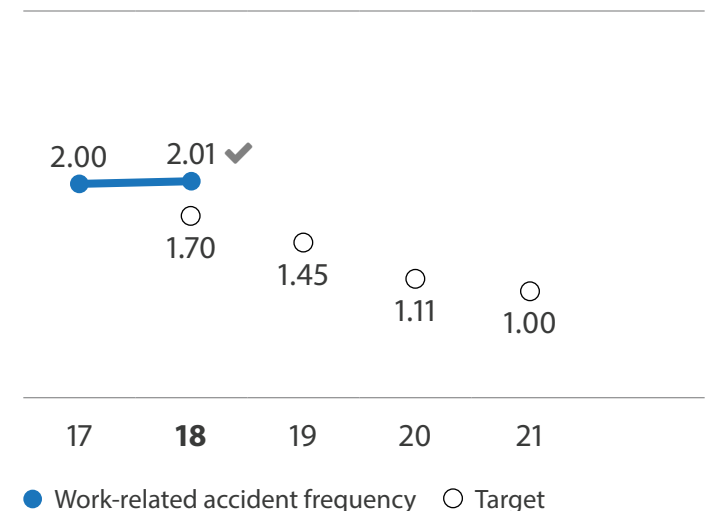
the cornerstone of the desired change in corporate culture.

- A symbolic time-out was taken by over 9,000 employees and managers to familiarize themselves with the new Statement of Occupational Health and Safety Principles. Employees, managers and executives in the 26 departments targeted (where 90% of the accidents occur) suspended their activities.
- A new indicator was established to gauge potentially high-severity events and bolster our investigation and analysis practices to prevent the recurrence of serious events.
- A total of 2,489 cases were opened under the Employee Assistance Program. ✓ Free, confidential and always available, the program helps employees resolve personal or professional issues in a timely manner.
- Occupational health and safety training sessions continued, with 61,943 enrollments (24,033 in 2017). Over half of these (56%) addressed implementation of the management rule concerning drugs and alcohol in the workplace and awareness of the effects of cannabis.



Observational site visits are one of the risk management strategies identified in the company's Health and Safety Action Plan 2017–2020.

### WORK-RELATED ACCIDENT FREQUENCY (per 200,000 hours worked)



Accident frequency remained unchanged from 2017. The company has developed action plans to reduce slips and falls in parking lots in winter, the risk of musculoskeletal disorders and accidents involving moving vehicles.



**BUILDING SUSTAINABILITY INTO EVERYDAY LIFE**

*The company is changing, and women are gaining more and more influence. They now make up 60% of the Board of Directors. We have to continue encouraging them to apply for managerial positions and take their rightful place on our management committees. Despite our openness to difference and all the work we've accomplished, there is still a lot left to do if Hydro-Québec is to become a more open and inclusive company that respects differences.*

**Julie Sbeghen, Director – Electricity Supply and Rates, Hydro-Québec Distribution, and Ambassador for Inclusion and Diversity**

FULL TESTIMONIAL



- The Shawinigan machine shop received an innovation award from the Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST) for a soundproof booth used in grinding turbine wicket gates for a hydroelectric generating station. Prior to this innovation, welders were exposed to a number of risks related to the projection of particles of molten metal, dust, noise and shattering components. Noise and dust in suspension also affected other welders in the shop. The booth contains the noise and metal dust and halts the trajectory of spinning particles if a grinding wheel breaks.
- The Ouvrons l'œil hotline allows employees to report security incidents promptly. Over the year, 2,551 reports were received ✓ (2,460 in 2017).

**CHAMPIONING WOMEN AND DIVERSITY**

The face of Québec is changing, and society is becoming and more and more diverse. We want our workforce to reflect the population as a whole, with its wealth of talent and experience. Embracing diversity can be a major asset in working toward the company's growth ambitions in Québec and elsewhere. Eager to support this change, Hydro-Québec hopes to make inclusion and diversity a source of collective strength. That effort will involve three main thrusts:

- Take advantage of the diversity of Québec society to secure the best talent
- Build strong teams composed of employees and managers with a wide range of profiles, ideas and life experiences
- Identify managers who demonstrate inclusive leadership

**REPRESENTATION OF TARGET GROUPS (%)**

	2015	2016	2017	2018 ✓
Women	29.0	28.7	28.9	28.8
Indigenous people	1.1	1.4	1.5	1.6
Ethnic minorities	1.4	1.5	1.5	1.6
Visible minorities	4.0	4.1	4.5	5.1
People with disabilities	0.9	0.7	0.6	0.6

An employee may be included in more than one category.





**GRI** GRI 102-13, GRI 405-1

In 2009, Hydro-Québec launched its employment equity program to increase the presence of certain groups that are underrepresented among its employees. Those groups include women, Indigenous people, people with disabilities and self-declared members of ethnic and visible minority groups.

The company is changing, and there are more and more women in executive positions. On December 31, 2018, they accounted for 60% of the Board of Directors and 24% of the company's executives. However, there is still a great deal to be done to improve the representation of certain target groups.

 **2018 HIGHLIGHTS**

- ▶ Twelve Cégep and university students with disabilities were provided with internships of at least three months, allowing them to gain valuable work experience in various units of the company. Two interns were subsequently hired.
- ▶ A total of 324 employees were of Indigenous origin, including 69 women (21%). ✓
- ▶ Target groups accounted for 34.8% of employees ✓ (34.4% in 2017).

- ▶ Some 448 new employees (35.6% of new hires) belonged to one or more of the five target groups ✓ (36.6% in 2017).
- ▶ A second cohort of employees were welcomed under the professional mentorship program launched in 2017 for new immigrants. To date, the initiative has given 24 newcomers (14 in 2018) an opportunity to gain valuable work experience in their fields. Over 80% of mentorees are now employed by the company.
- ▶ Fifty of the company's women managers and professionals took part in [L'effet A Défi 100 jours](#), a challenge designed to encourage women to get into management or climb the corporate ladder. About 120 women from Hydro-Québec have taken part since it was launched in 2016.

**COOPERATION AND INFLUENCE, IN QUÉBEC AND AROUND THE WORLD**

Hydro-Québec is a member of a number of associations and organizations that promote hydropower and other renewable energies. We also take part in meetings and technical discussions with foreign companies and international power industry representatives.

**AWARDS AND HONORS**



Best Corporate Citizen in Canada  
*Corporate Knights* magazine



Ranked by Quebecers as the second-most responsible company  
*Baromètre de la consommation responsable*



Named third-best employer in the country  
*Forbes Magazine*

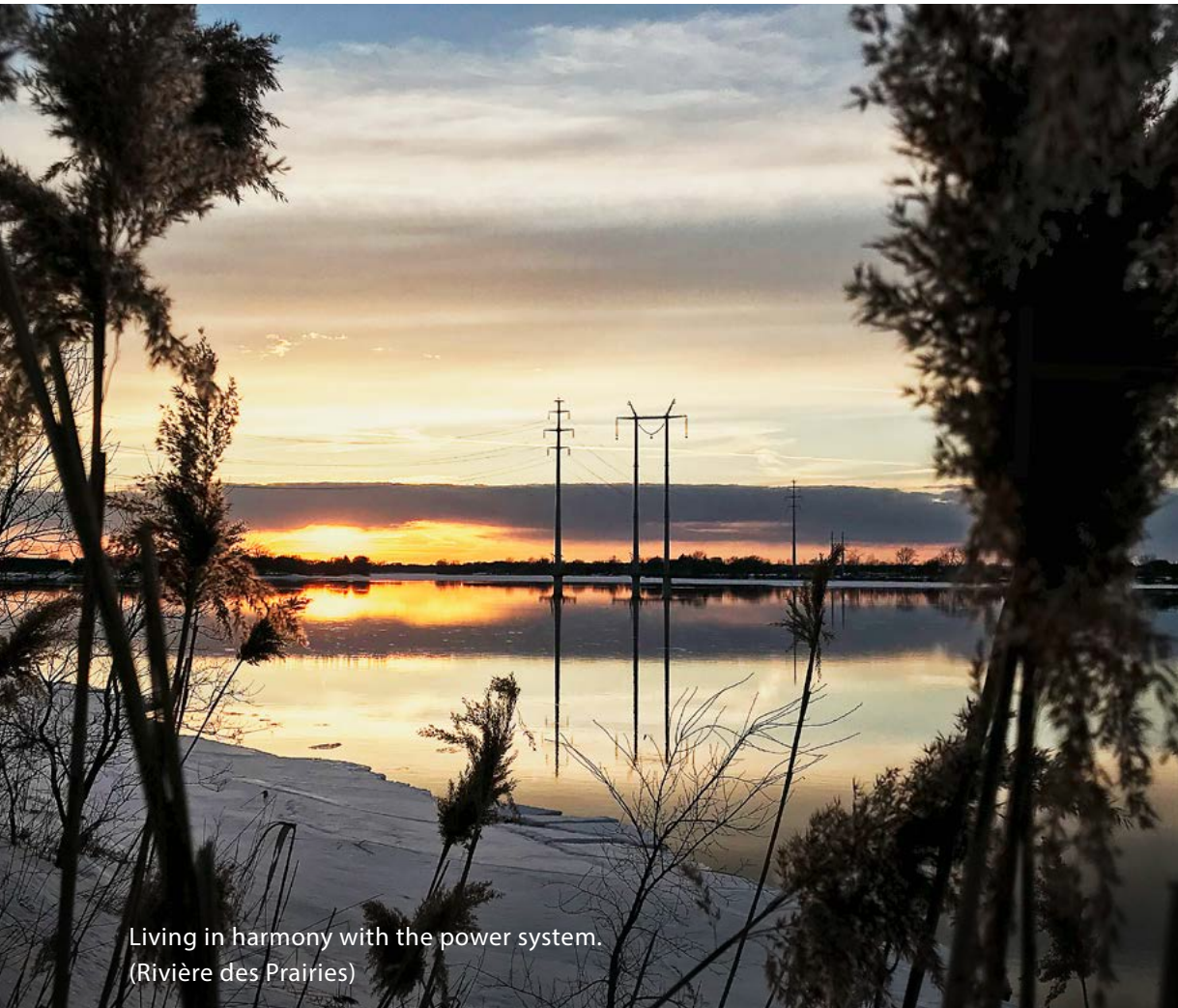
[+](#) LEARN MORE

[+](#) HYDRO-QUÉBEC'S PARTICIPATION IN GROUPS OUTSIDE QUÉBEC



**GRI** GRI 102-9, GRI 102-40, GRI 102-42, GRI 102-44, GRI 102-47, GRI 103-1, GRI 103-2, GRI 201-1

# ENSURING THE SOCIAL ACCEPTABILITY OF ACTIVITIES AND BEING AN EXEMPLARY COMPANY



Living in harmony with the power system.  
(Rivière des Prairies)

**IN THIS SECTION**

SOLUTIONS CONSIDERED AND EXAMPLES OF INITIATIVES TO BE IMPLEMENTED BY 2025

MATERIALITY ANALYSIS ASPECTS

STAKEHOLDERS CONCERNED

Hydro-Québec is a responsible corporate citizen that takes pains to understand the concerns and expectations of the communities with which it interacts. Eager to ensure the social acceptability of its activities, we strive to meet the needs of other land users, harmonize our facilities with the host environment and maximize our projects' spinoffs in every region of Québec.

**IN THIS SECTION**

- > Interacting with communities
- > Public participation
- > Land use
- > Heritage
- > Local procurement
- > Indigenous relations
- > Community investments
- > Integrated Enhancement Program
- > Fondation Hydro-Québec pour l'environnement
- > Donations and sponsorships
- > Employee volunteerism



**\$27.3 M**

**+ COMMUNITY INVESTMENTS**



**\$2,619 M** ✓

**+ PROCUREMENT OF GOODS AND SERVICES IN QUÉBEC**



UN SUSTAINABLE DEVELOPMENT GOAL AND TARGET ASSOCIATED WITH THIS CHALLENGE



**+ SEE TARGET**



GRI GRI 413-1

# A responsible presence in the community

Hydro-Québec's projects and operations are an integral part of the daily lives of people across Québec. To ensure their harmonious execution, the company maintains an ongoing dialogue with the communities affected by its projects in order to listen to their concerns and expectations and adjust its projects, as far as possible, to local circumstances. This approach aims to make our projects and operations socially acceptable.

Every project is unique, and the measures taken to promote social acceptability may vary depending on the host community's expectations. A project's social acceptance does not necessarily mean there is no opposition, but rather that as broad a consensus as possible has been achieved. By securing public participation and working with stakeholders from the start of each project, we encourage communities to collaborate in developing our projects and creating the conditions that make them acceptable and mutually beneficial.



## PATRIOTES SUBSTATION – CONSULTATION RESULTS

As part of the project to build [Patriotes substation](#), which will be located in Saint-Eustache, two potential substation sites and two proposed line routes were submitted to local organizations, affected landowners and residents living near the route variants. Over 40 meetings were held, providing a better understanding of issues related to urban development, landscape, agricultural vitality, agritourism and other local realities. The selected variant was then improved in order to reduce the impact of the final project to be submitted to the government authorities and increase its social acceptability.

[Map of proposed routes and routes selected](#)

## CONSULTATION WITH FISHERMEN ON THE ÎLES-DE-LA-MADELEINE UNDERWATER LINK: AN INNOVATIVE APPROACH

As part of the Îles-de-la-Madeleine energy transition, Hydro-Québec plans to connect the islands to the main grid in the Gaspésie region via an underwater link. To gain a better understanding of local fishing activity, the company invited fishermen to provide input at meetings and by means of an online interactive map.

The interactive map is a new feature that allows fishermen to take part in project-related discussions whenever it suits them. By the end of the year, over 40 people had made online comments—an outstanding response rate in light of the fact that the study area is used by some 400 fishermen. Participants provided information on the species fished and sensitive areas, which will help Hydro-Québec adjust its plans to local needs.



**EXCLUSIVE  
WEB CONTENT**

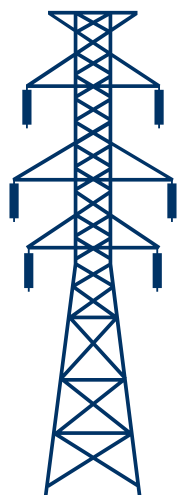
- [Construction work and projects](#)



## PUBLIC PARTICIPATION PROCESS

	Planning	Draft design	Government approvals (permitting)	Construction	Operation/Report
<b>Duration</b>	1 to 2 years	2 to 5 years	1 to 2 years	2 to 12 years – Generation 1 to 5 years – Transmission	Variable – up to 30 years
<b>Description</b>	Determine requirements and develop scenarios	Determine technical content, variants, route, constraints, permits required, impacts on the environment and communities, etc.	Obtain government approvals	Begin work	Conduct environmental and agreement follow-ups
<b>Public Participation</b>	Determine issues and contact local authorities and organizations	Meet with communities, provide information and consult stakeholders	Hold public hearings (if required) and continue discussions	Track work progress and maintain good public relations	Respect commitments and follow through on agreements

## EXAMPLES OF PUBLIC PARTICIPATION



**120-kV Grand-Brûlé–Saint-Sauveur supply line**  
(Laurentides)

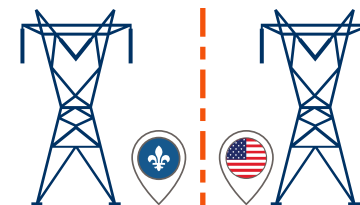
PROJECT FACT SHEET

PROJECT DESCRIPTION AND STATUS

**735-kV Micoua–Saguenay line**  
(Côte-Nord, Saguenay–Lac-Saint-Jean)

PROJECT FACT SHEET

PROJECT DESCRIPTION AND STATUS



**Appalaches–Maine Interconnection**  
(Chaudière-Appalaches, Estrie)

PROJECT FACT SHEET

PROJECT DESCRIPTION AND STATUS



**315/25-kV Saint-Jean substation and 315-kV supply line**  
(Montréal)

PROJECT FACT SHEET

PROJECT DESCRIPTION AND STATUS



GRI GRI 413-1

# Interacting with communities

Thanks to its ongoing dialogue with municipal governments, community groups and Indigenous authorities, Hydro-Québec is well informed about community concerns regarding its activities.

Since many of our generation and transmission facilities are located on Indigenous land, we pay special attention to relationships with these communities.



## 2018 HIGHLIGHTS

- ▶ We processed 4,663 requests ✓ from community representatives on a wide range of topics.
- ▶ We conducted a province-wide tour to inform municipal managers and elected officials about our activities and collect input on community concerns. All in all, meetings were held in 689 municipalities representing 6.8 million people, or 82% of the Québec population.
- ▶ We met with elected officials, MNAs, regional environment councils (Chaudière-Appalaches and Estrie), environmental groups, landowners and citizens in connection with development of the Appalaches–Maine interconnection project.

## RELATIONS WITH INDIGENOUS COMMUNITIES

Conscious of the unique character of Indigenous communities, and in full respect of their culture and traditional land use, Hydro-Québec adjusts its practices with a view to establishing mutually beneficial partnerships.

Since 1975, we have signed over 30 agreements with Indigenous nations and communities in connection with our generation and transmission projects. For the Romaine project (Côte-Nord), the three agreements signed with the Innu communities affected provide for the creation of funds to finance economic, community and cultural projects, traditional activities and training programs.



## 2018 HIGHLIGHTS

- ▶ Under the Apatisiwin Agreement, the company employed 104 Crees (77 men and 27 women) in various positions, including power system electricians, mechanics, and telecommunications and automatic controls operators and technicians. ✓

- ▶ An Atikamekw business in Wemotaci reforested the Parent generating station site, seeded the former bed of the Rivière Bazin and built a rest area for recreational activities. This work was valued at roughly \$300,000. (Mauricie)
- ▶ A communication process was established with the Inuit, Crees and Naskapis in regard to the discharge of 750 m<sup>3</sup>/s of water at the Duplanter spillway in the Caniapiscau reservoir region over the summer. (Nord-du-Québec)



## MAP OF THE INDIGENOUS NATIONS AND COMMUNITIES OF QUÉBEC



### EXCLUSIVE WEB CONTENT

- [Integrated Enhancement Program](#)
- [Fondation Hydro-Québec pour l'environnement](#)



**GRI** GRI 203-1



The city of Rouyn-Noranda, in Abitibi-Témiscamingue, a regional center.

**2018 SURVEY OF OUR MUNICIPAL PARTNERS: SATISFACTION ON THE RISE**

Hydro-Québec surveys its municipal partners every four years. The latest survey shows an increase in satisfaction with the company since 2014, climbing from 7.4 out of 10 to 7.7. That increase is observed across the province.

However, our municipal partners' satisfaction with certain company initiatives related to social and environmental responsibility is moderate and has been declining since 2010.

The survey enabled us to identify the subjects of greatest interest to our municipal partners, collect their input and assess the merit of existing communication channels. These data will allow us to develop an action plan and review our practices to better address municipalities' needs.

**INTEGRATED ENHANCEMENT PROGRAM**

Despite the considerable effort made to harmonize transmission lines and substations with their host environments, Hydro-Québec is aware that the presence of these facilities may have residual environmental impacts. For that reason, the Integrated Enhancement Program (IEP) was created to improve the overall environment in communities where power lines and towers are built. Program funds are used to carry out local initiatives that benefit the community: improvements to the environment or to municipal, community and recreational infrastructure, regional and tourism development, and the development of Indigenous communities.

In 2018, \$3.3 million was granted for 22 initiatives. ✓ Since the IEP was introduced, \$133.4 million has been granted for 1,316 initiatives.

**REVAMP OF THE IEP**

Hydro-Québec established the IEP in 1985. Since then, this voluntary initiative has enabled us to forge links with a wide range of groups, including Indigenous communities, municipalities, boroughs, MRCs and agglomerations. The IEP was given a makeover in 2018. Here are the program's new features:

1. The program now applies to more transmission facilities.
2. The amount granted is calculated according to the transmission facility's characteristics and determined at project outset.
3. Quebecers can now play a role in selecting the initiatives funded by the IEP. Eligible organizations are invited to set up mechanisms for ensuring that citizens have a say in the matter.

**FUNDING AND FINANCIAL COMMITMENTS – INTEGRATED ENHANCEMENT PROGRAM**

	2015	2016	2017	2018
Number of initiatives	16	25	27	22 ✓
Hydro-Québec funding (\$'000)	1,584.1	3,001.2	4,231.0	3,349.5 ✓
Community funding (\$'000)	4,462.1	9,809.9	23,641.7	8,437.8
Project value (\$'000)	6,047.1	12,811.1	27,872.7	11,787.3



**CITIZEN INVOLVEMENT IN RIVIÈRE-DES-PRAIRIES-POINTE-AUX-TREMBLES BOROUGH**

As part of the 735-kV Chamouchouane–Bout-de-l’Île line project, local citizens were involved in helping the borough council select the initiative that will receive \$327,000 from the IEP. After setting the rules and conditions, a local steering committee held two workshops where citizens were invited to suggest projects in three Rivière-des-Prairies parks and three Pointe-aux-Trembles parks previously chosen by the borough council.

The selected project involves creating a rest and gathering area in Parc Ernest-Rouleau, with a view of the Rivière des Prairies and connected to an existing footpath. The new facility is located near Autoroute 25 and Boulevard Gouin.

 **2018 HIGHLIGHTS**

- An ecocenter was built in Sainte-Anne-des-Plaines, home to a section of the new Chamouchouane–Bout-de-l’Île line. Funding of \$204,900 was provided for this initiative in 2017. (Laurentides)
- La Tuque’s Lac Saint-Louis park, a site dedicated to recreation and relaxation, going for walks and observing nature, was refurbished. The initiative involved adding a number of features, making repairs to the reception area and footpath, installing new lighting and urban furniture, building a comfort station with storage space, installing signage and interpretation panels and constructing a playground. Funding of \$907,700 was provided for this initiative in 2017. (Mauricie)

**FONDATION HYDRO-QUÉBEC POUR L’ENVIRONNEMENT**

The Fondation Hydro-Québec pour l’environnement contributes to the enhancement of the environment and long-term protection of Québec’s ecological heritage. The Foundation funds initiatives throughout the province that have positive social and environmental impacts and serve the interests of local communities. Since its inception in 2001, it has granted close to \$16 million for 284 projects with an estimated total value of over \$50 million.

 **2018 HIGHLIGHTS**

- The town of Bromont received \$220,000 in funding ✓ to help make improvements to Parc des Sommets, a 150-ha site on Mont Brome that has been protected from real-estate development. In addition to mitigating soil erosion problems on certain paths and protecting the forest ecosystem, the project will involve installing interpretation panels, markers, proper signage and observation platforms. (Montérégie)

**COMMITMENTS – FONDATION HYDRO-QUÉBEC POUR L’ENVIRONNEMENT**

	2015	2016	2017	2018 ✓
Projects supported (number)	16	18	16	12
Regions involved (number)	9	9	9	7
Amount granted (\$’000)	964	971	738	765



GRI GRI 413-1

# Land use and integration of new facilities in the community

Hydro-Québec, which operates facilities across Québec, is the province's second-largest property owner, after the Québec government. We also manage numerous reservoirs, dams and control structures, taking care to preserve the quality of water bodies and to share their use with waterfront communities whenever possible. With input from experts in various fields, we carry out our operations while taking local communities' expectations into account.

In conducting our projects and regular operations alike, we consider land-use planning initiatives such as development plans and plans for the use of public land. We review our practices regularly to ensure that our facilities, whether generating stations in remote regions or distribution systems in built-up areas, integrate harmoniously with current and future land uses.

## 2018 HIGHLIGHTS

- Hydro-Québec joined the Greening Leaders Committee of Montreal, along with CN and the Port of Montreal. The committee's members invest in greening their properties and pledge to create a real movement in Montréal's business community. (Montréal)
- We created a multi-purpose space in the right-of-way of the new 315-kV line connecting Charland and Fleury substations. Developing trails and planting trees compatible with safe power system operation helped revitalize this Ahuntsic-Cartierville neighborhood and increased the project's social acceptability. (Montréal)
- Drawing on our 2017 spring flood experience, we implemented a communication plan to explain our water management strategy for the Rivière Saint-Maurice catchment area, highlight the company's expertise and address community concerns. (Mauricie)



### MAKING BEAUTIFICATION SUSTAINABLE

To counter the problem of graffiti on the fence surrounding the building located at 600, rue Fullum, in the Ville-Marie borough, we asked charitable organization MU to paint a mural. Illuminated at night, the work brightens up this very busy urban setting and can be seen by pedestrians, motorists driving along Notre-Dame Est and cyclists using the nearby bike path. Like images from a comic book, artist Stéphane Leclerc's succession of shapes call to mind Pont Jacques-Cartier's majestic structure and the nearby port facilities. Together, they evoke the presence of the river and seem to bask in the nighttime atmosphere.





**GRI** GRI 102-11, GRI 403-2, EU25

# Public health and safety

Hydro-Québec monitors its facilities and manages its operations with a view to reducing risks and ensuring public safety. To that end, we maintain secure access to our facilities and inform the public about the hazards of electricity and the risk of drowning near hydropower generating facilities.

We also study the potential human health risks inherent in our operations and take steps to mitigate them. For example, we know that reservoir impoundment temporarily increases fish mercury levels and that they return to normal after 10 to 35 years. We monitor this phenomenon closely and issue fish consumption recommendations as needed.



## 2018 HIGHLIGHTS

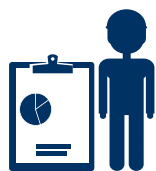
- We took steps to head off potential noise complaints regarding Sept-Îles substation by acquiring land around the facility, where a study had shown that the substation generated noise levels in excess of permitted limits on adjacent lots. (Côte-Nord)
- In keeping with our dam safety program, we opened the Robert-Bourassa generating facility's eight spillway gates for the first time since 1987. Doing so enabled our teams to collect a great deal of invaluable information. (Nord-du-Québec) [Watch the video](#) (in French only)
- We monitored noise levels at the Saint-Jean substation construction site in Dollard-des-Ormeaux using two autonomous noise measuring stations powered by a solar panel and remote-controlled via cellular modem. The stations were set up in the backyards of two residents living next to the site. (Montréal)
- We launched an awareness campaign on identifying dangerous wires and published [a video](#) on the dangers posed by the wires strung between distribution poles.

- Preventive patrols were carried out near certain hydropower facilities to educate people found close to danger zones and to ask them to leave, if necessary.

### ELECTRICAL ACCIDENTS – 2018

	INCIDENTS ✓	DEATHS ✓
Public – Hydro-Québec facilities	8	1
Public – use of electricity	2	0
Skilled workers – Hydro-Québec facilities	24	2
Skilled workers – use of electricity	5	0
Hydro-Québec employees	183	0
<b>TOTAL</b>	<b>222</b>	<b>3</b>

The three deaths by electrocution resulted from accidental contact with distribution line conductors during work at heights.



**+** HYDRO-QUÉBEC OPERATIONS AND HUMAN HEALTH – CURRENT STATUS



**GRI** GRI 102-7, GRI 102-9, GRI 201-1, GRI 203-2, GRI 204-1

# Our socioeconomic contribution

## HYDRO-QUÉBEC'S CONTRIBUTION TO THE QUÉBEC ECONOMY

Hydro-Québec's operations support thousands of jobs and stimulate economic activity in many Québec regions. All together, they account for about 4% of Québec's gross domestic product (GDP). However, GDP, an economic indicator that measures the value of the goods and services produced by a country, does not adequately quantify all the positive effects of sustainable development, such as a company's social engagement in its community.

## LOCAL PROCUREMENT

Hydro-Québec facilities are sometimes located in remote areas that are difficult to access or far from service centers. These operations are often controlled remotely, without requiring the day-to-day presence of employees. To provide essential services, however, we sometimes deal with local suppliers, which maximizes local spinoffs.

Local suppliers, mainly SMEs, contribute to the economies of Québec's regions. Because they have a presence in the community and strong local ties, they are able to provide the flexibility that many of these procurement activities require.

## HYDRO-QUÉBEC'S CONTRIBUTION TO THE QUÉBEC ECONOMY

	2015	2016	2017	2018
Dividend (M\$)	2,360	2,146	2,135	2,394
Public utilities tax (M\$)	268	284	284	298
Water-power royalties (M\$)	654	667	695	699
Municipal and school taxes (M\$)	37	40	38	39
Procurement from Québec-based companies (%)	93	94	92	91
Community investments (M\$)	27	28	28	27

## SOCIAL ECONOMY ENTERPRISES

Social economy enterprises owe their existence to the entrepreneurial spirit of people who have mobilized to serve the needs, aspirations or well-being of their members and the community as a whole. Comprising non-profit organizations, cooperatives and mutual associations, they are active in close to 20 sectors of the economy. These enterprises are important to the development of Québec and its regions. Emploi Québec recognizes their role in employing and ensuring the social integration of individuals who are isolated from the labor market (including new immigrants) or have functional limitations.

Hydro-Québec awards these enterprises contracts valued at \$33.8 million, accounting for 1.2% of the total value of all its contracts. For housekeeping/janitorial contracts, this proportion climbs to 7.6%. Of Hydro-Québec's 7,732 suppliers, 46 (0.6%) are social economy enterprises.

[Portrait of social economy enterprises under contract – housekeeping/janitorial services](#) (+)

[Value of contracts awarded to social economy enterprises, by goods and services category](#) (+)



**GRI** GRI 102-9



The roads on the Romaine-4 jobsite are maintained by a company from the region, under a contract awarded by Hydro-Québec.

In addition, to maximize the contributions of regional businesses to certain large-scale projects, Hydro-Québec favors suppliers that subcontract to businesses based in the administrative regions where the work is to be performed.

**2018 HIGHLIGHTS**

➤ 53% of housekeeping/janitorial contracts (19 suppliers) and 97% of snow removal contracts (252 suppliers) were awarded to businesses based in the same administrative region or near the sites in question. The average contract term was five years.



Station F-MR, a temporary public space in Montréal, received financial support from Hydro-Québec.

**SOCIAL RESPONSIBILITY DIRECTIVE**

Hydro-Québec has reviewed its Donation and Sponsorship Policy in light of its communication objectives and the goals laid out in its Strategic Plan. With the adoption of its new Social Responsibility Directive, the company hopes to maximize the impact of its contributions by focusing on specific, measurable change that meets a real need, whether environmental, economic or social. The three issues we prioritize are reducing greenhouse gas emissions, supporting the economic vitality of Québec's regions and fighting poverty.

To be eligible, the applicant must be a not-for-profit organization whose basic mission reflects one of these three issues. Hydro-Québec is gradually withdrawing from areas like health and sports. Henceforth, support for research chairs will be handled by Hydro-Québec's research institute, IREQ.

[Social Responsibility Directive](#)

**INDIGENOUS-OWNED BUSINESSES**

Indigenous communities have created a number of businesses that provide goods and services to Hydro-Québec. Found across Québec, they also play a significant role in local procurement. The value of the contracts awarded to Indigenous-owned businesses is \$97 million, or 3% of the total value of all contracts.

[Categories of goods and services contracts awarded to Indigenous-owned businesses, and contract values](#)

**EXCLUSIVE WEB CONTENT**

**Socioeconomic contribution**

- [Donations and sponsorships](#)
- [Teachers' Resources](#)
- [Hydro-Québec Art Collection](#)
- [Guided tours](#)
- [Guest speakers from Hydro-Québec](#)



**GRI** GRI 102-9, GRI 201-1

## DONATIONS AND SPONSORSHIPS

Hydro-Québec supports Québec’s cultural, social and economic life with donations and sponsorships from a budget provided for in our Business Plan.

### 2018 HIGHLIGHTS

- We supported 601 organizations through donations and sponsorships.
- We provided support for the seventh edition of Robotique FIRST Québec, a robotics competition that strives to inspire primary and secondary students and spark an interest in science and technology.
- We renewed our \$30,000 donation to the Fondation Tel-jeunes. This organization ensures the continued operation of Tel-jeunes and LigneParents, two front-line services that provide professional counselling and support services to young people and parents across Québec.

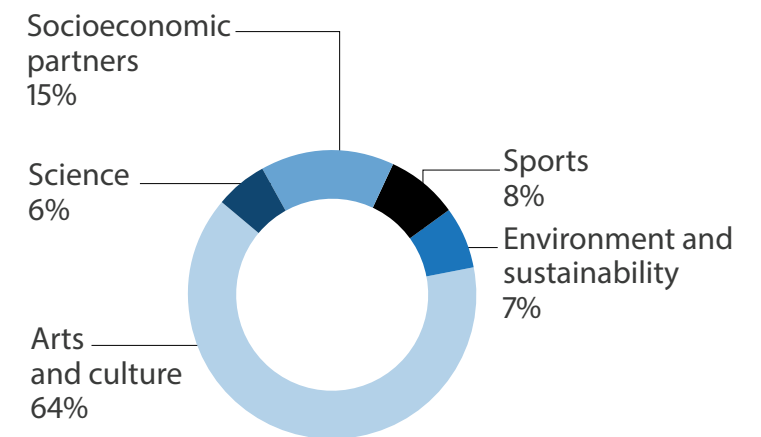
## EMPLOYEE ENGAGEMENT

At Hydro-Québec, we encourage our employees to share their know-how and expertise. We also acknowledge their efforts to promote sustainability in the company or the community. Many of our employees and managers devote personal time to volunteering, for example by serving as board members, speaking to schoolchildren or taking part in community activities.

### 2018 HIGHLIGHTS

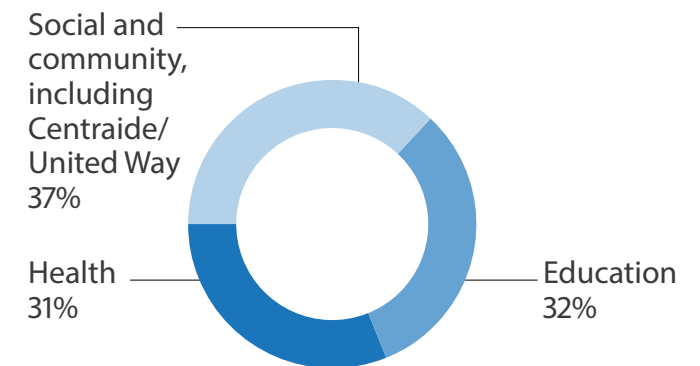
- Our experts made 32 presentations on biodiversity, the energy industry and sustainability. Those presentations were attended by over 962 students from 17 institutions of higher education.
- We contributed \$6.2 million to the 42nd Centraide/United Way campaign, which supports organizations working to improve the quality of life of people in difficulty. ✓ That contribution, nearly half of which came from Hydro-Québec’s employees and pensioners, exceeded our target. The company has matched employee donations since 1992.

## BREAKDOWN OF SPONSORSHIPS<sup>a</sup> – 2018

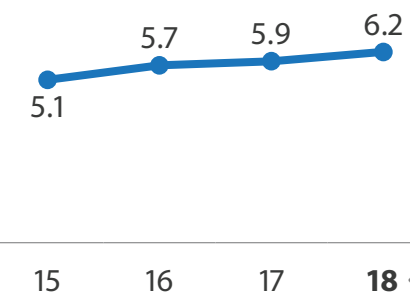


a) Excludes funding by the Fondation Hydro-Québec pour l’environnement.

## BREAKDOWN OF DONATIONS – 2018



## CONTRIBUTION TO CENTRAIDE/UNITED WAY – EMPLOYEES’ AND PENSIONERS’ CAMPAIGN (\$M)





**GRI** GRI 102-40, GRI 102-42, GRI 102-44, GRI 102-47, GRI 103-1, GRI 103-2, EU29

# CONTINUOUSLY IMPROVING CUSTOMER SATISFACTION



IN THIS SECTION

SOLUTIONS CONSIDERED AND EXAMPLES OF INITIATIVES TO BE IMPLEMENTED BY 2025

MATERIALITY ANALYSIS ASPECTS

STAKEHOLDERS CONCERNED

In the midst of the energy transition, the evolution of the power industry is changing Hydro-Québec’s relationships with its customers. In the foreseeable future, our customers may be doing much more than using electricity: they could also be generating it, storing it and feeding into the grid. Then, more than ever, we will have to take customer expectations into account in all our decision making. Continuous improvement of service quality helps keep customers loyal, as well as fostering employee engagement and pride. It enables us to achieve our goal of making Hydro-Québec a benchmark in customer service.

## IN THIS SECTION

- > Service reliability and continuity
- > Electricity prices
- > Vegetation control
- > Low-income households
- > Customer services (expectations, satisfaction, complaints)



**411 min/customer** ✓

⊕ SYSTEM AVERAGE INTERRUPTION DURATION INDEX – DISTRIBUTION SYSTEM



**93%** ✓

⊕ SATISFACTION WITH THE COMPANY



UN SUSTAINABLE DEVELOPMENT GOAL AND TARGET ASSOCIATED WITH THIS CHALLENGE



⊕ SEE TARGET



# Customer service

Hydro-Québec uses a variety of indicators to measure residential and business service quality. Call wait time and number of complaints and claims are key indicators. The 14 customer relations centers located across Québec field more than three million calls annually.

For over 25 years, we have been using surveys to determine our customer satisfaction index. Also, in compliance with the *Act respecting the Régie de l'énergie*, a complaints mechanism allows customers who feel they have been wronged to express their dissatisfaction.

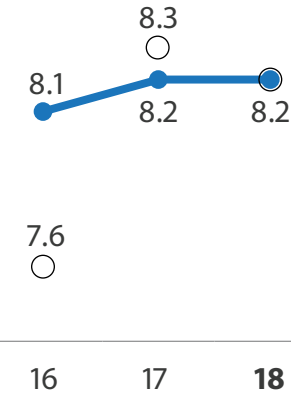
## AVERAGE CALL WAIT TIME AT CUSTOMER RELATIONS CENTERS

	2015	2016	2017	2018 ✓
Average wait time (seconds)	231	99	84	87

## 2018 HIGHLIGHTS

- In 88% of simple service connections, the connection was completed within 10 business days ✓ (92% in 2017).
- In 88% of service connections involving multiple parties, the connection was completed on the first scheduled date ✓ (85% in 2017).
- The number of complaints declined by 6% from 2017. Complaints regarding guarantee deposits were down 22%, but those concerning rates were up 31%, chiefly owing to the colder weather than the year before. ✓
- We reviewed practices and procedures to provide quick, optimum, personalized handling of complaints. A procedure for determining the causes of customer dissatisfaction upstream and dealing with irritants at the source has been implemented. All employees can now report issues noted in the field to a special team through a single point of access.

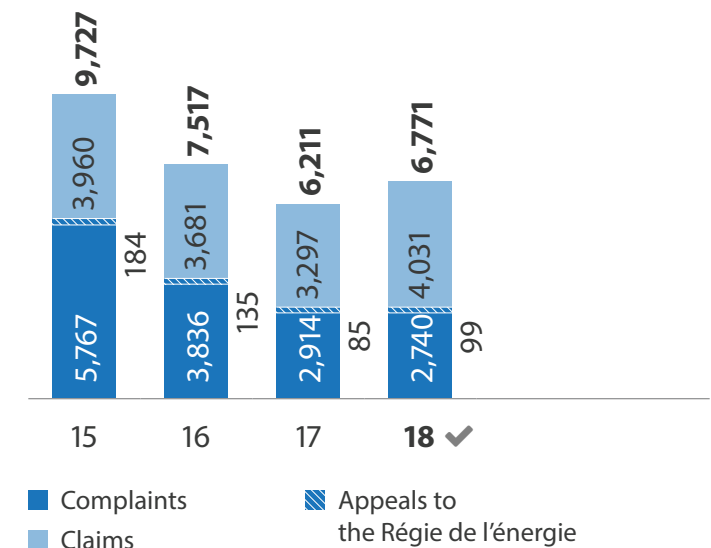
## OVERALL CUSTOMER SATISFACTION INDEX (scale of 10)



● Actual ○ Target

As the calculation method was revised in 2016, the results in years since then cannot be compared with those of previous years.

## CUSTOMER COMPLAINTS AND CLAIMS (number)



Claims were up 22% over 2017—41% for property damage caused by our employees and by contractors and 41% for damage caused by outages and voltage fluctuations (bad weather, work on the grid, etc.). ✓



GRI EU3

## CUSTOMER-FOCUSED CULTURE

To achieve our goal of providing better customer service, we must develop a culture that makes customers the focus of our decisions and concerns. The higher customer satisfaction index of recent years can be credited to many initiatives. But there is still room to increase the number of customers who say they are very satisfied.

Above all, we want our 20,000 employees to put customers first. That is why we are raising their awareness of the need and advantages of developing its culture by getting them to think about what a customer-first approach means.

### MANAGE RENTAL UNITS TOOL ENHANCED

The self-serve Manage Rental Units tool in the Customer Space allows property owners to manage tenants' arrivals and departures more easily and at no cost. Property owners can also receive an e-mail alert whenever one of their units is affected by a change, such as a service interruption, tenant moving in or out, or change in responsibility for the electricity bill.

[Watch video](#)



## 2018 HIGHLIGHTS

- The [mobile app](#) was enhanced. In addition to making the most recent invoice available and displaying outages in real time, the app lets users access a number of other services. They can now manage their accounts anytime, receive alerts when they use more power than anticipated (if they're on the Equalized Payments Plan) and monitor their hourly electricity use. During the year, the app was downloaded 271,988 times for either Android or iOS devices.
- An option to chat with customer service representatives was added to the Customer Space. This channel complements our Twitter and Facebook Messenger accounts. Over 109,000 conversations took place over the course of the year.
- A special telephone line was set up for employees wishing to help a relative or customer in their dealings with the company. It received over 2,030 calls in 2018.
- A fifth translation services agreement was added to help customers who are going through the collection process but are not fluent in either French or English. As a result, the company is able to interact with customers in 28 languages.



### NEW STREAMLINED, MODERNIZED, IMPROVED BILL

To help customers better understand their electricity bill, Hydro-Québec redesigned the layout. Essential information can now be seen at a glance and key information is highlighted. It includes a table that compares electricity use with the previous year and shows average temperatures and consumption history.

A total of 41% of customers have signed up for Online Billing, meaning that 13 million invoices a year no longer need to be printed. ✓

PORTRAIT OF OUR CUSTOMERS





# Reliability and continuity of electric service

Recognized the world over for the reliability of its transmission system, Hydro-Québec spares no effort to stay at the forefront of the industry in this regard. Our grid is one of the most extensive in North America, with 34,361 km of lines ✓ and 532 substations. ✓

Throughout most of Québec, the distribution system consists of overhead lines on wood poles. The system comprises over 103,976 km of lines, and 99% of its 2.5 million poles are made of wood.

## MAINTENANCE AND ASSET SUSTAINMENT

To ensure a reliable power supply for its customers, Hydro-Québec undertakes major maintenance and upgrading work every year on its transmission and distribution systems.

Every year, we perform over 200,000 maintenance tasks on the distribution system—over 92% of them while the lines are live, so customers do not lose service. However, in the interests of worker and public safety, sometimes service must be interrupted. Although these scheduled interruptions cause certain inconveniences, they help reduce the number and frequency of power outages.

Major investments have been made in the transmission and distribution systems, and they will continue in the years to come.

## 2018 HIGHLIGHTS

- Transmission system investments totaled \$1.8 billion.
- Distribution system investments totaled \$664 million.
- The LineScout robot was used to inspect a stretch of the 735-kV line over Félix-Leclerc highway near the city of Québec—a company first. This robot, developed by Hydro-Québec's research institute (IREQ), was used to inspect spiral rods that prevent ice buildup and quickly carry out work on on live lines, without interfering with road traffic.

## LARGE-SCALE MOBILIZATION

### ÎLES-DE-LA-MADELEINE

Twenty-one crews were dispatched to the Îles-de-la-Madeleine to restore service. Gusts of up to 120 km/h had caused extensive outages and damaged the transmission and distribution systems. Close to half of our island customers had lost power. With the help of contractors, the Communauté maritime and the Canadian Armed Forces, Hydro-Québec crews were able to get the situation back to normal quickly in this island community that was also without any means of communication. Power was restored to 95% of affected customers within 72 hours.

[Watch video](#) 

### GATINEAU REGION

After tornados damaged a lot of equipment and knocked out power to 118,000 customers, 718 employees worked to repair the grid. Power was restored to 95% of affected customers within 42 hours.

### OUTSIDE QUÉBEC

Hundreds of line workers, accompanied by mechanics and support staff, were mobilized to lend a hand in Nova Scotia, New Jersey, Pennsylvania and New York during major outages caused by weather events.





## SERVICE CONTINUITY

Service quality is measured by the system average interruption duration index (SAIDI), which reflects the average service interruption time per customer over the course of a year. Some scheduled interruptions are required for system maintenance; unscheduled outages are caused by bad weather, invasive vegetation or equipment failure.

A variety of activities are carried out to ensure a reliable power supply, including programs to control vegetation on transmission and distribution line rights-of-way. A total of over 100,000 km of distribution lines must be kept clear, at the rate of about 17,000 km a year. That requires an annual budget of about \$60 million.



**WHY CONTROL VEGETATION NEAR POWER LINES?**



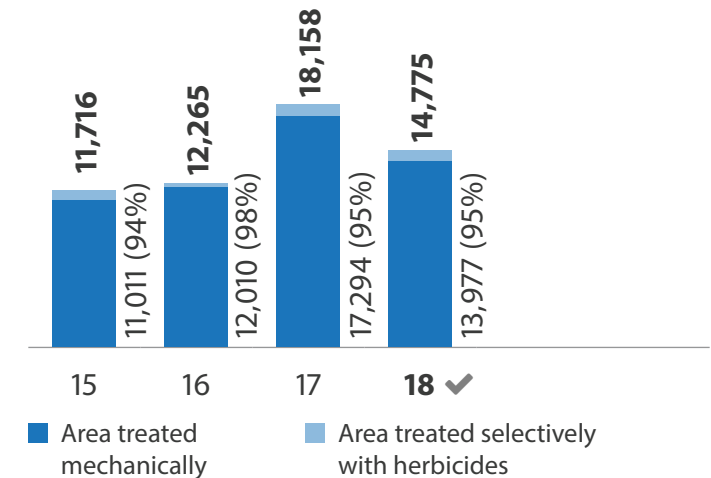
**UNDERSTANDING POWER OUTAGES**



## 2018 HIGHLIGHTS

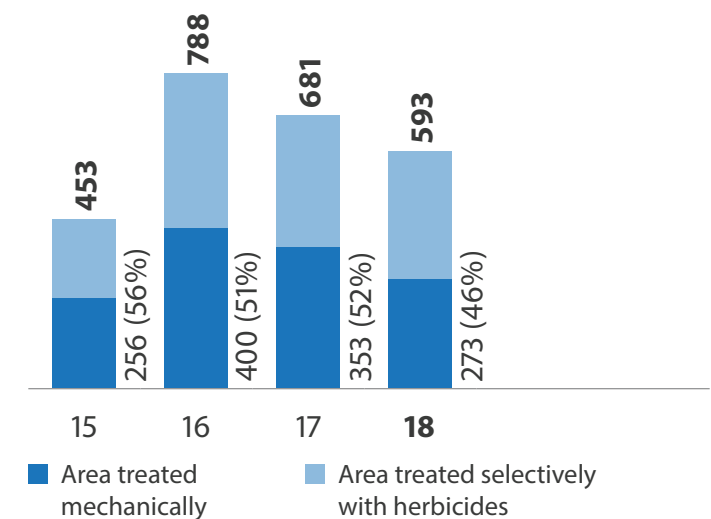
- The town of Matagami worked with us on reporting trees liable to cause power outages. We agreed to take advantage of a service interruption already scheduled with the community to fell trees.
- Large industrial customers were given training on power quality. The 91 participants from 66 companies learned about the various types of electrical disturbances that can occur on the grid and affect their electrical equipment. Measures to prevent those disturbances were also presented.
- IREQ tested an experimental 25-kV line to determine the kinds of outages that can be caused by tree branches touching power lines. Crews are now better equipped to take action to protect the grid.
- A pilot project to inform customers about tree pruning planned in their area was launched.
- We prepared communications plans emphasizing the importance of vegetation control for municipalities and residents.

## VEGETATION CONTROL ALONG TRANSMISSION LINES (ha)



In 2018, transmission line rights-of-way covered a total area of 179,144 ha. The area cleared was 3,383 ha smaller than in 2017: 3,317 ha less cleared mechanically and 66 ha less treated selectively with herbicides. The proportion of mechanical clearing has remained fairly stable over the years. ✓

## VEGETATION CONTROL ON DIKES AND DAMS (ha)



Herbicide use and mechanical treatment vary, depending on the five-year vegetation control planning cycle. The proportion of herbicides used changes annually.

**GRI** GRI 102-13



We monitor the power system constantly to ensure service continuity.

## GRID SECURITY AND CYBERSECURITY

Recent cyberattacks on the power industry in the U.S. and Europe have served as a reminder that no country is safe from cyber-piracy. Hydro-Québec takes these threats seriously and monitors the network continuously to ensure a reliable power supply. A specialized cybersecurity team has been keeping watch for years. Hydro-Québec systems have never yet been hacked.

Although an increasing number of devices are connected to the Internet, the company has a significant advantage when it comes to preventing cyberattacks: it has its own telecommunications network and so controls its entire environment.



An open house held at the Baie-Comeau telecontrol center helps keep us close to the community.

## 2018 HIGHLIGHTS

► 15 employees were interviewed as part of a NERC standards compliance audit. The audit, carried out with observers from the Régie de l'énergie in attendance, examined critical infrastructure protection standards. It checked compliance of current practices with respect to physical and cybersecurity in the System Control Center, the telecontrol centers and the backup center.

## NORTH AMERICAN STANDARDS

The power industry, like others, is targeted by hackers. Grid operators like Hydro-Québec must meet the stringent reliability standards of the North American Electric Reliability Corporation (NERC), including with respect to cybersecurity.

NERC is a regulatory body that assesses the reliability of North American systems. Whenever an event occurs on its system, Hydro-Québec must submit all the reports required by NERC's Event Analysis Program. Reports are filed with the Northeast Power Coordinating Council, which, after analysis, may request further information before forwarding them to NERC for final review.



# Rates and electricity use

Hydro-Québec is required to charge the same electricity rates throughout Québec, except for off-grid systems north of the 53rd parallel. Rates are based on the consumption profile of the different customer categories.

Thanks to the low-cost heritage pool of electricity, Québec has some of the lowest rates in North America. Each year, we file a rate case for approval by the Régie de l'énergie, the economic regulatory body for Québec's energy sector. Our rate application is analyzed in a rigorous process that culminates in December in public hearings where all stakeholder representatives can express their views.

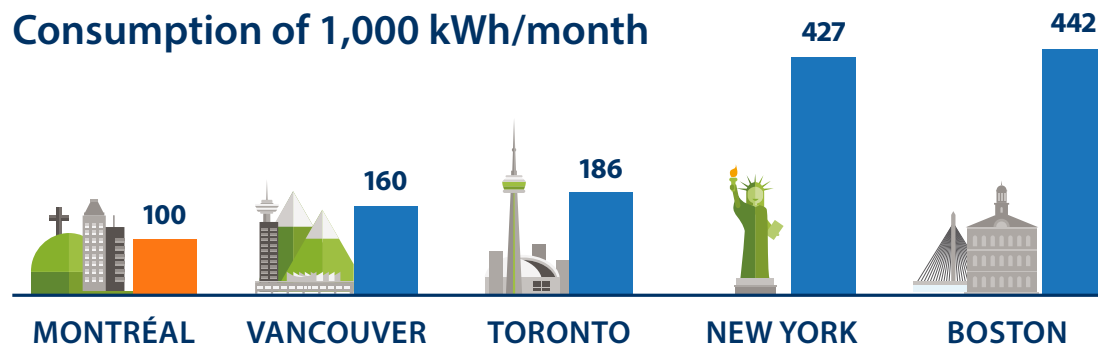
## ELECTRICITY PRICES

Electricity delivered to Québec residential customers is the cheapest in Canada—and even North America. Residential customers in Toronto pay about twice as much as in Québec, and in New York they pay four times as much.

While electricity is inexpensive in Québec, it still represents a significant outlay for some households. For many years, Hydro-Québec has been making it easier for low-income households to stay on top of their electricity bills. For example, we've modified our collection procedures and energy efficiency initiatives to fit their situation.

## INDEX OF ELECTRICITY PRICES FOR RESIDENTIAL CUSTOMERS IN MAJOR NORTH AMERICAN CITIES

### Consumption of 1,000 kWh/month

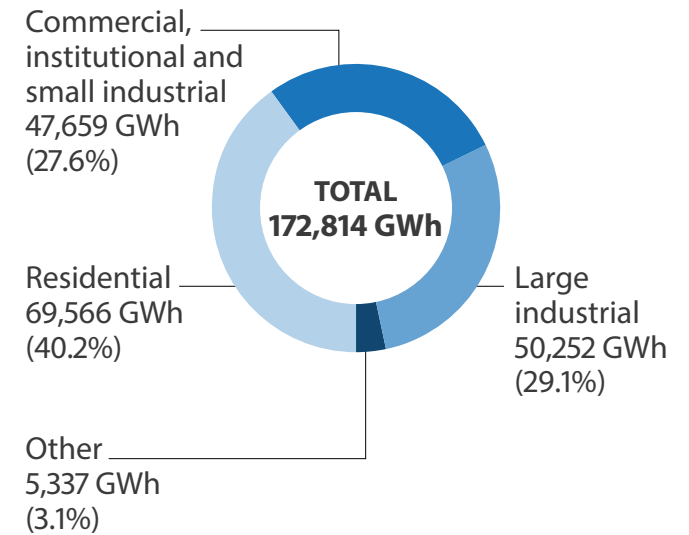


As at April 1, 2018 – residential customers.

HOW ELECTRICITY RATES ARE SET

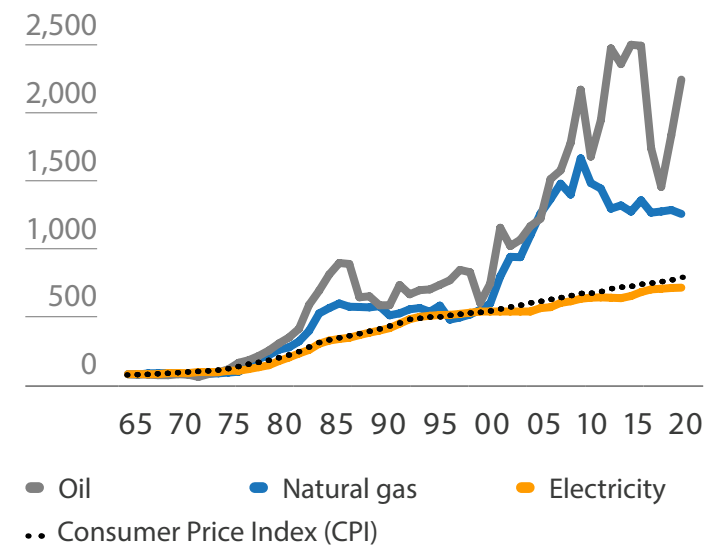
COMPARISON OF ELECTRICITY PRICES IN MAJOR NORTH AMERICAN CITIES

## ELECTRICITY SALES IN QUÉBEC BY SEGMENT – 2018 ✓



## INFLATION AND ENERGY PRICES IN QUÉBEC – 1963-2018

Index (1963 = 100)



Electricity prices have stayed in line with inflation, whereas the prices of oil and gas have fluctuated more significantly. According to the available data, the consumer price index in Canada is 825, while it is 755 for electricity, 1,280 for natural gas and 2,254 for oil.



**2018 HIGHLIGHTS**

- ▶ The rate adjustment of 0.3% on April 1, 2018, for all residential customers and most business customers, and the 0.9% increase of April 1, 2019, reflect our commitment to keep rate increases at or below inflation for the fourth year running.
- ▶ Payment arrangements were signed with residential customers to facilitate settlement of 373,749 cases ✓ representing \$688 million gross in arrears.
- ▶ 92,882 payment arrangements ✓ covering \$403 million gross were reached with low-income customers; 45,125 of the agreements, ✓ amounting to \$89 million, provide assistance with payment of arrears and, if necessary, partial payment for current electricity use.
- ▶ 189 employees attended the workshop on doing business in a context of poverty to learn about collecting from low-income customers who are having difficulty making payments. ✓ We have offered this workshop since 2003.

▶ Hydro-Québec Distribution filed an application with the Régie de l'énergie for the setting of rates and conditions of service for customers using cryptography applied to blockchains. The purpose of the application is to provide a framework for service for cryptography as applied to blockchains to ensure an electricity supply for this new customer category, as well as to maximize Hydro-Québec's revenue. Some 300 applications have been received, representing many thousands of megawatts.

**CROSS-SUBSIDIZATION**

In Québec, the idea behind cross-subsidization is to offer residential customers affordable rates. Cross-subsidization consists in charging one or more customer categories higher rates than the allocated service cost in order to be able to offer lower rates to one or more other customer categories. Residential customers benefit from cross-subsidization, paying only about 86% of the service cost. The difference in service cost is covered by the other rate categories.

To ensure that customer categories pay fair electricity rates while benefiting residential customers, the *Act respecting the Régie de l'énergie* stipulates that a category's rate cannot be modified so as to reduce cross-subsidization.

**CROSS-SUBSIDIZATION INDEX PER CUSTOMER CATEGORY – 2018**

CUSTOMER CATEGORY	CROSS-SUBSIDIZATION INDEX
Domestic	85.6
G (small-power customers, such as convenience stores or hair salons)	120.6
M (medium-power customers, such as SMEs, small industrial companies and shopping centers)	129.9
LG (large-power customers not engaged in an industrial activity, such as hospitals, universities and office buildings)	103.2
L (large-power customers engaged in an industrial activity)	107.6

An index value below 100 indicates that the customer pays less than the cost of service. An index value above 100 means the customer is charged more than the cost of service and thus helps to offset the shortfall from another category.



**GRI** GRI 102-40, GRI 102-42, GRI 102-44, GRI 102-47, GRI 103-1, GRI 103-2, GRI 201-2, GRI 305-1, GRI 305-2, GRI 305-3, GRI 305-4, GRI 305-5

# PRESERVING THE ENVIRONMENT AND ADAPTING TO CLIMATE CHANGE



Aerial shot of the Romaine-3 sector.  
(Côte-Nord)

IN THIS SECTION

SOLUTIONS CONSIDERED AND EXAMPLES OF INITIATIVES TO BE IMPLEMENTED BY 2025

MATERIALITY ANALYSIS ASPECTS

STAKEHOLDERS CONCERNED

Québec's power industry produces less than 1% of the province's greenhouse gas (GHG) emissions, compared to 12% for Canada. This is due in large part to hydropower's predominant place in Québec's energy mix. In addition to reducing GHG emissions from its operations, Hydro-Québec is taking steps to preserve biodiversity and make managing environmental impacts an integral part of its business processes. Its environmental management system, which is ISO 14001:2015-compliant, ensures that the company adopts and maintains sound environmental practices.

## IN THIS SECTION

- > GHG emissions from Hydro-Québec operations
- > Emissions avoided by net electricity exports
- > Adaptation to climate change
- > Biodiversity management
- > Environmental management



90%

+ REDUCTION IN GHG EMISSIONS SINCE 1990

7,901,691 t CO<sub>2</sub> eq. ✓

+ EMISSIONS AVOIDED THANKS TO NET ELECTRICITY EXPORTS



UN SUSTAINABLE DEVELOPMENT GOAL AND TARGETS ASSOCIATED WITH THIS CHALLENGE



+ SEE TARGETS



**GRI** EU5, GRI 201-2

# Climate change

In 2018, at the annual United Nations Climate Change Conference (COP24) held in Katowice, Poland, nearly 200 countries agreed on a final text that formalizes the goals of the [Paris Climate Change Agreement](#), signed in 2015. However, several questions remained unanswered, such as the reform of market mechanisms related to [carbon credit trading](#).

For its part, the Intergovernmental Panel on Climate Change (IPCC) published a report showing that unprecedented changes must be made quickly in every aspect of modern society to limit global warming to 1.5°C compared to pre-industrial levels and mitigate the potentially catastrophic effects, including extreme weather events, rising sea levels and the melting of Arctic sea ice. According to the report, net global CO<sub>2</sub> emissions generated by human activity have to be reduced to zero by 2050 if warming is to be limited to 1.5°C. Doing so would require the large-scale adoption of renewable energy sources.

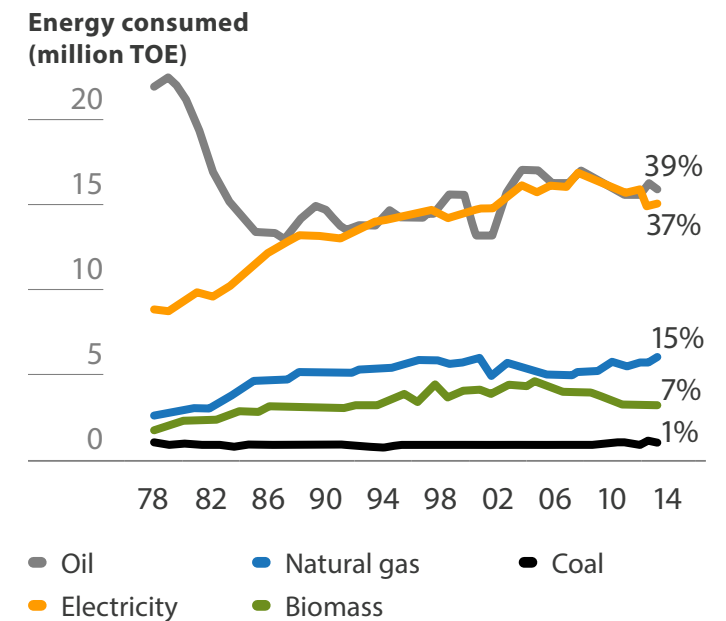
By providing its customers with energy that is 99.8% clean and renewable, ✓ Hydro-Québec is helping to preserve air quality and reduce the impact of climate change. However, some of its operations produce atmospheric contaminants or GHG emissions, for which mitigation measures are implemented.

## CARBON MARKET

Québec and California are partners in the Western Climate Initiative's [carbon market](#). The two markets have been officially linked since January 1, 2014. Under Québec's cap-and-trade (C&T) system for GHG emission allowances, organizations, such as Hydro-Québec, that emit more than 25 kt CO<sub>2</sub> eq. annually must offset their emissions in accordance with set terms and conditions. After joining Québec and California in 2018, Ontario withdrew from the carbon market on July 3, 2018.

[Carbon market](#) (+)

## (+) TRENDS IN THE CONSUMPTION OF DIFFERENT FORMS OF ENERGY IN QUÉBEC (1978–2013)



Sources: Ministère de l'Énergie et des Ressources naturelles du Québec and Statistics Canada

Most up-to-date data available at the time of publication of this report.



(+) ENERGY CONSUMPTION IN QUÉBEC BY SECTOR – 2016



(+) MAIN SOURCES OF GHG EMISSIONS IN QUÉBEC, CANADA AND THE WORLD



**GRI** EU5, GRI 201-2, GRI 305-1, GRI 305-7, GRI 417-1



Outaouais substation, the main component in the 1,250-MW interconnection with Ontario. Hydropower exports avoid the emission of substantial quantities of GHGs.



Îles-de-la-Madeleine generating station, Québec's largest diesel-fired thermal power plant. The Îles-de-la-Madeleine energy transition will lead to a sizable reduction in GHG emissions.

**2018 HIGHLIGHTS**

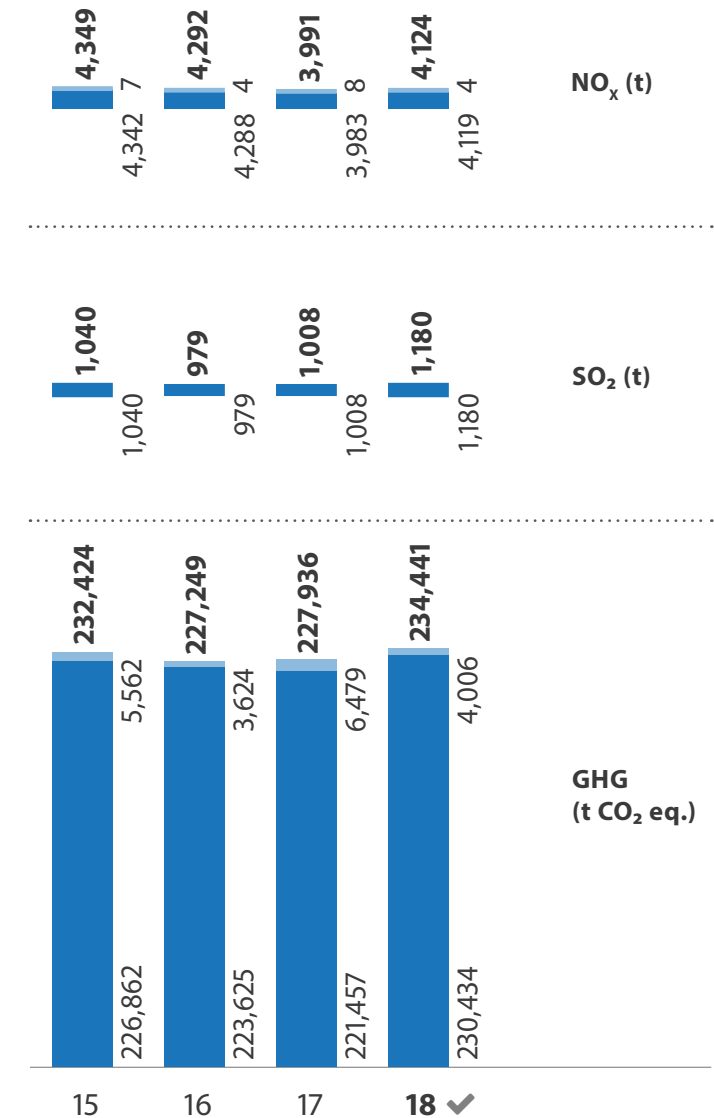
- ▶ Emissions avoided by net exports of electricity totaled 7,901,691 t CO<sub>2</sub> eq. ✓ (8,362,305 t CO<sub>2</sub> eq. in 2017). These avoided emissions were 21 times greater than the company's direct emissions for the same period. ✓
- ▶ Atmospheric emissions from electricity generation and purchases in Québec were significantly lower than the average for other Canadian provinces and neighboring U.S. states: 535 t CO<sub>2</sub>/TWh (325 times less), 2.2 t SO<sub>2</sub>/TWh (153 times less) and 8.7 t NO<sub>x</sub>/TWh (240 times less). ✓ Every year, Hydro-Québec updates a fact sheet, [Electricity Supply and Air Emissions](#), which industrial customers can use to calculate their carbon balance.

- ▶ We offset senior management's travel-related GHG emissions by purchasing carbon credits (90 t CO<sub>2</sub> eq.). ✓
- ▶ GHG emissions from Hydro-Québec's light-vehicle fleet have decreased by 26% compared with 2009, and by 1.5% compared with 2017. ✓



**2050 GREENHOUSE GAS EMISSION-REDUCTION TARGETS – EXPORT MARKETS**

**ATMOSPHERIC EMISSIONS FROM HYDRO-QUÉBEC THERMAL GENERATION OPERATIONS**



■ Generating stations supplying off-grid systems  
 ■ Generating stations connected to the main grid

Most emissions are produced by thermal generating stations in off-grid systems. Only Bécancour thermal generating station supplies the main grid during peak periods. Variations in GHG, SO<sub>2</sub> and NO<sub>x</sub> emissions are due to annual variations in the thermal stations' output.



GRI GRI 201-2, GRI 305-1, GRI 305-2, GRI 305-3, GRI 305-4, GRI 305-5, GRI 417-1

**GHG EMISSIONS FROM HYDRO-QUÉBEC OPERATIONS – 2018** (t CO<sub>2</sub> eq.)

CATEGORY	OPERATIONS	2018 ✓
<b>Direct sources (scope 1)</b>		
Generating stations	Thermal power plants	234,441
Mobile sources	Vehicle fleet	51,785
	Hydro-Québec aircraft fleet	13,516
	Utility vehicles (e.g., snowmobiles, tractors, snowblowers)	941
	Propane-fueled lift trucks	83
Fuel use	System maintenance generators	4,205
	Emergency and jobsite generators	666
	Building heating	673
Other uses	Equipment containing CF <sub>4</sub> and SF <sub>6</sub>	62,722
	Aerosols	428
	Equipment containing HFCs	599
	Synchronous compensators	24
<b>Indirect sources (scope 2)</b>		
Energy losses	Power transmission and distribution system losses	8,260
<b>Indirect sources (scope 3)</b>		
	Electricity purchases	106,778
	Business travel – employee personal vehicles	5,508
	Vehicles leased long-term	2,265
	Business travel – trains	14
	Business travel – commercial airlines	1,762
	Helicopters	4,032
	Chartered airplanes	4,784
	Life cycle of fuel	50,803
<b>Total emissions</b>		
	<b>Direct sources scope 1</b>	<b>370,083</b>
	<b>Indirect sources scope 2</b>	<b>8,260</b>
	<b>Indirect sources scope 3</b>	<b>175,947</b>
	<b>Direct and indirect sources</b>	<b>554,289</b>
<b>EMISSIONS AVOIDED (NET EXPORTS OF ELECTRICITY)</b>		<b>7,901,691</b>

GHG emissions from Hydro-Québec operations account for 0.7% of Québec emissions.

Overall total and sum of subtotals may differ due to rounding.

COMPARE 2015–2018 EMISSIONS

**EXCLUSIVE  
WEB CONTENT****GHG emissions**

- [GHG emissions and Hydro-Québec electricity](#)
- [GHG emissions and reservoirs](#)
- [Life cycle assessment](#)





GRI GRI 102-11, GRI 102-13, GRI 201-2

# Adaptation to climate change

More and more, Hydro-Québec is feeling the effects of climate change and extreme weather on its operations, whether it's violent winds, tornadoes or the frequency and intensity of very heavy precipitation.

To gain a better understanding of climate change and its impact and to adapt as necessary, the company has been working for 17 years with [Ouranos](#), a research consortium created in 2001 by the Québec government, Environment Canada and Hydro-Québec.

**2018****HIGHLIGHTS**

➤ Hydro-Québec's senior management adopted two recommendations from the in-house committee that documented the impact of climate change on the company's operations. The first recommendation consisted of adding climate change risks to Hydro-Québec's risk portfolio, while the second involved implementing a corporate adaptation process. An inventory of asset vulnerabilities is also being drawn up to assist in determining what action should be taken.

## EXAMPLES OF CLIMATE CHANGE ADAPTATION MEASURES

### ASSET VALUES

We are working with Ouranos on a project launched in 2018 to incorporate climate change into our process for assessing the value of hydroelectric assets. The goal is to show how changes in precipitation regimes, river flows and seasonal temperature and precipitation patterns can affect the average annual output of hydroelectric power stations. The data collected will be used in generating fleet management scenarios to better assess climate change risks.

### FLOOD LEVEL PREDICTIONS

The company is also collaborating on another Ouranos project to develop a method for taking account of climate change in 1,000-year and 10,000-year flood predictions, used in the design and management of dams. We hope to establish a number of best practices to guide our activities while taking operating needs into account.

### ENERGY FORECASTS

A third project aims to improve energy forecasts to better reflect current climate-related data. Advanced statistical tools have been developed to take better account of recent climate changes in our forecasts regarding natural water inflows.

### LYME DISEASE

A fourth project deals with Lyme disease and the expansion of tick habitats in Québec as a result of climate change. The study looks at the best ways to protect workers who are most at risk of being exposed to these disease-carrying insects.



TRENDS IN DIFFERENT METEOROLOGICAL VARIABLES OVER THE COMING DECADES: IMPACTS, CONSEQUENCES AND ADAPTATION OPTIONS



GRI GRI 102-11, GRI 102-13, GRI 304-1

# Biodiversity

In addition to preserving biodiversity in all its activities, Hydro-Québec works to protect species at risk and a range of ecosystems. We ensure that the environments we develop are comparable to the surrounding natural environments in matters related to species biodiversity and biological productivity. Climate change, trade and some of our operations foster the proliferation of invasive animal and plant species and pathogens. Once established, these species can affect biodiversity and be detrimental to farming and forestry. We take this new reality into consideration in our construction-related activities, particularly excavation, operations and vegetation management. Moreover, Hydro-Québec is adapting its practices in regard to these issues of biosecurity: a broad-based review was undertaken in 2016, and a plan of action will be put into effect in 2019.

## 2018 HIGHLIGHTS

- We worked with the Ministère des Forêts, de la Faune et des Parcs to conduct a walleye inventory over seven consecutive days at Lac Kempt. (Lanaudière)
- Fish passes were used by 2,515 elvers (young eels) at Chambly dam and by 30,539 elvers at Beauharnois generating station, twice as many as in 2016. (Montréal)
- During a temporary shutdown of Mitis-2 generating station, a device directed salmon into the tailrace canal so that they would not remain stuck at the foot of the spillway. Over 990 salmon were caught, transported and redeposited upstream of the generating station so that they could continue their migration. (Bas-Saint-Laurent)
- We helped protect 16 endangered wildlife species in Québec, including the wood turtle and golden eagle, by participating in the work of six recovery teams coordinated by the Ministère des Forêts, de la Faune et des Parcs.




### REFURBISHMENT OF BRYSON GENERATING STATION – A PLANT SPECIES REQUIRING PROTECTION

Built in 1924 and 1925, Bryson generating station is located on the Rivière des Outaouais (Ottawa River). Before replacing its three generating units and its upstream and downstream decks, we carried out an inventory of the natural environment. A wide variety of animal and plant species, including several protected species, were noted.

The construction of a new warehouse encroaches on the habitat of the fragrant sumac, a [vulnerable species](#) (in French only), leading to a loss of habitat for a number of specimens. For that reason, 18 sumac plants were transplanted. A follow-up study on the relocated plants will be done in 2019 to gauge the success of the operation.

[Complete project fact sheet](#) 



 FOLLOW-UP ON THE OURANOS ECOSYSTEMS AND BIODIVERSITY PROGRAM



**GRI** GRI 102-11, GRI 102-12, GRI 306-3

# Environmental management

Managing the environmental impacts of our operations is an integral part of our business processes. We monitor and carry out environmental follow-ups on our projects under development and facilities in operation. We also integrate environmental and social criteria into our processes for procuring goods and services. These measures aim to reduce environmental impacts, increase social spinoffs and enhance the economic viability of our suppliers throughout the life cycle of their products.

## ACCIDENTAL RELEASE OF CONTAMINANTS

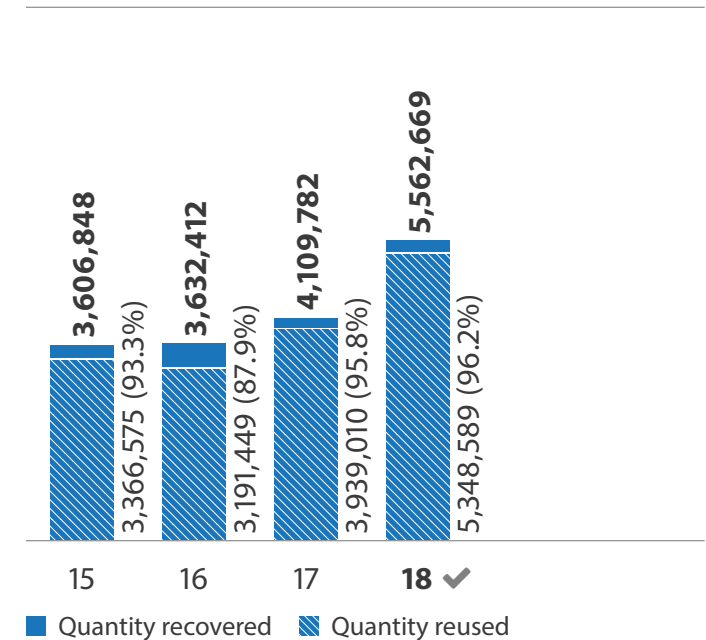
Alert procedures have been put in place throughout the company, and the steps to be taken in the event of an accidental release are well established. In addition, all releases are recorded in a single system, regardless of their volume, and cause analyses are prepared for any incidents considered to be major.

[Statistics on reported releases](#)

## 2018 HIGHLIGHTS

- Hydro-Québec conducted a historical analysis of the management of Brisay hydroelectric facility, located at the Caniapiscou reservoir outlet. The study, which covers the last 20 years and is accompanied by a characterization of sensitive components, will allow us to mitigate the environmental impact of reservoir management.
- We saved 2.3 million litres of drinking water through our program for refurbishing administrative buildings. This program has generated recurring savings totaling 287 million litres since 2007.
- Ongoing decommissioning of Gentilly-2 nuclear generating station: A total of 6,000 spent fuel bundles were moved to the dry storage areas. Although the reactor has been shut down since December 28, 2012, preparation for dormancy and maintenance activities generate low-level or intermediate-level waste. Over the year, a total volume of 18.9 m<sup>3</sup> of low- or intermediate-level radioactive waste was moved for storage. [Complete project fact sheet](#)

## RECOVERY AND REUSE OF INSULATING OIL (litres)



Recovered oil suffices for all the company's requirements. The oil is decontaminated and regenerated for reuse in equipment. Oil that cannot be regenerated is reclaimed as energy.



### EXCLUSIVE WEB CONTENT

- [Declaration of ISO 14001 environmental principles](#)



GRI GRI 102-11

## MANAGEMENT OF CONTAMINATED LAND



**2018  
HIGHLIGHTS**

- ▶ We simulated an accidental release of contaminants at Rapide-7 generating station. Both practical and theoretical, this exercise was designed to prepare employees to respond effectively to any hazardous material spill. Given to managers and civil engineering workers, the day of training proved to be very informative. To simulate the presence of contaminants, peat moss was spread over the river. The simulation identified several avenues for improvement in regard to both the equipment used and the response measures themselves.
- ▶ Supplementary environmental characterization work was performed on the soil and groundwater at Kangirsuk thermal power plant to look into concerns raised by previous work. Eight boreholes and three observation wells did not show any significant soil contamination. Groundwater results were below the detection threshold.



The site of the former Cadillac thermal generating station, where environmental rehabilitation work is being carried out.

### RECOVERY OF SOLID WASTE

Since Cadillac thermal generating station in Abitibi-Témiscamingue was decommissioned in 2014, Hydro-Québec has been conducting environmental rehabilitation work. The 5,800 tonnes of solid waste (ballast from the railway that serviced the site) were recovered by Multitech Environnement, an integrated waste management service, and used to cover a landfill. Thanks to this approach, Hydro-Québec was able to save \$1 million while meeting the environmental requirements of the Ministère de l'Environnement et de la Lutte contre les changements climatiques.

The site was restored in 2018, and demolition waste recovery will be completed next year.

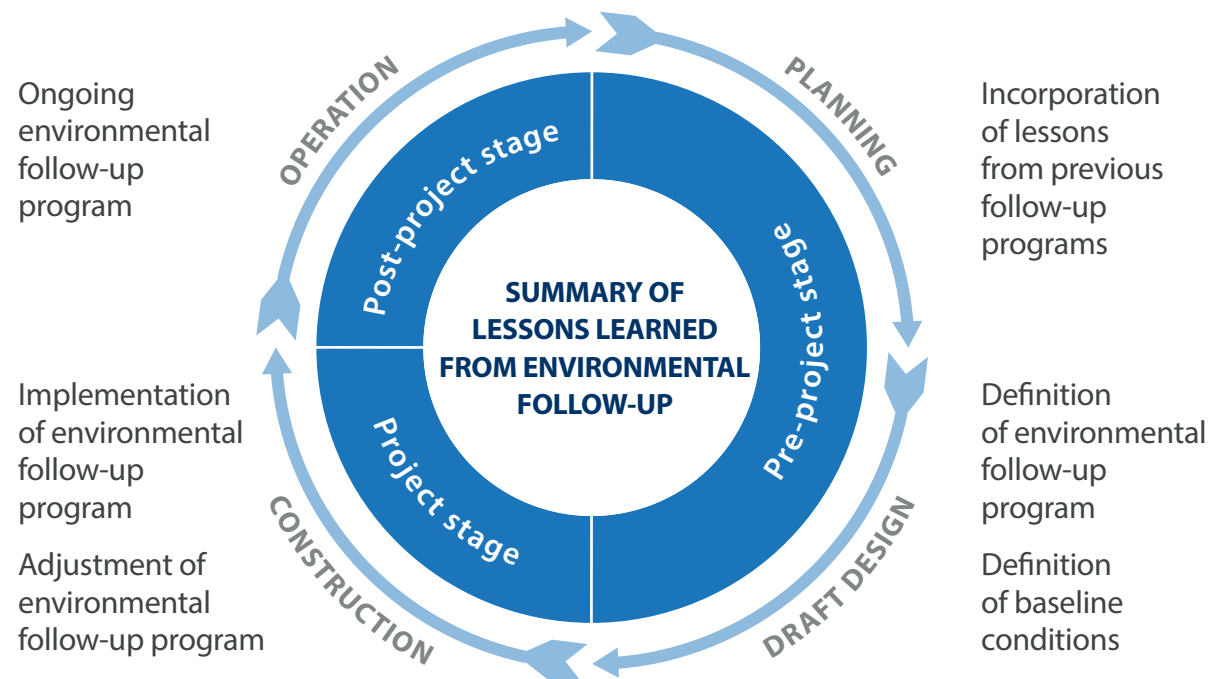
### CONTAMINATED SOIL TRACEABILITY PILOT PROJECT

Hydro-Québec is currently reviewing its work methods and contaminated-soil management contracts to determine whether it can be held responsible for suppliers' unlawful releases of contaminated soil. In addition, we are testing Traces Québec, a contaminated-soil traceability system designed by Réseau Environnement in cooperation with WikiNet, in order to assess the merit and technical and economic feasibility of implementing it at Hydro-Québec. We are the first company to take part in an initiative of this kind.

Two pilot tests were conducted to evaluate the Traces Québec system during water and ground transportation of contaminated soil. They showed that the system was compatible with our existing transportation and contaminated-soil management practices.



**FOLLOW-UP ON FACILITIES IN OPERATION**



**CHUTE-ALLARD AND RAPIDES-DES-CŒURS FACILITIES (MAURICIE)**

**ACTION PLAN IMPLEMENTATION AND FOLLOW-UP ON THE WEMOTACI TRENCH LANDFILL**

› Follow-up on the trench landfill shows that the landfill surface is intact, that the site is entirely covered with chiefly herbaceous vegetation and that trees and shrubs are gradually growing over the site. Since all commitments have been delivered, environmental follow-up is now finished.

**FOLLOW-UP ON SITE REFORESTATION**

› From 2008 to 2010, reforestation efforts consisted of planting 390,000 seedlings on a 150-ha area. Three follow-ups were performed: an evaluation of the quality of work (2010), a profile of tree-planting operations (2013) and the identification of needs related to corrective work (2017). The results of the latest survey showed that just over 90% (136.4 ha) of the reforested areas meet environmental requirements and that the new forest stands are growing adequately.

**DURATION OF ENVIRONMENTAL FOLLOW-UPS**

FACILITY	REGION	COMMISSIONED	END OF FOLLOW-UP	DURATION OF FOLLOW-UP <sup>a</sup> (years)
Romaine-1	Côte-Nord	2015	2040	31
Romaine-2	Côte-Nord	2014	2040	31
Romaine-3	Côte-Nord	2017	2040	31
Partial diversion of the Rivière Manouane	Saguenay–Lac-Saint-Jean	2003	2018	17
Péribonka	Saguenay–Lac-Saint-Jean	2007	2018	17
Chute-Allard	Mauricie	2008–2009	2019	13
Rapides-des-Cœurs	Mauricie	2008–2009	2019	13
Eastmain-Sarcelle-Rupert	Nord-du-Québec	2011–2012	2023	16

a) Environmental follow-up may begin as soon as the project is launched.

**FOLLOW-UP ON FACILITIES IN OPERATION****YOUNG DIKE REPAIRS  
(ABITIBI-TÉMISCAMINGUE)****WILDLIFE FOLLOW-UP AT THE POND  
DOWNSTREAM OF YOUNG DIKE**

➤ A follow-up study on the wildlife inhabiting the pond downstream of Young dike was carried out following structure rehabilitation work in 2016. Several mitigation measures had been implemented to limit the work's impact on fauna, particularly reptiles and amphibians. The results show that blue-spotted and yellow-spotted salamanders, wood frogs and northern spring peepers are reproducing in large numbers. Eastern newts, American toads, mink frogs and painted turtles can also be found in the pond. Only green frogs and common garter snakes were not seen in 2018, although a few individuals had been observed in or near the pond in 2015. Overall, the loss of pond area and depth does not seem to have affected the site's productivity, and the work has not had any significant impact on its reptile and amphibian species.

**BEAUHARNOIS CANAL RETAINING  
STRUCTURES (MONTÉRÉGIE)****FOLLOW-UP ON MITIGATION MEASURE  
EFFECTIVENESS**

➤ Mitigation measures were implemented to restore the exploratory paths cleared in the wetlands, close to western chorus frog habitats. As part of the geotechnical survey, wetland vegetation had to be cut to allow access by machinery. Following this work, the company restored the access paths and filled the boreholes. It also ensured that there were no ruts that could harm western chorus frog habitats. Follow-up on the recommendations and corrective work were conducted in the summer.

**EASTMAIN-SARCELLE-RUPERT  
COMPLEX (NORD-DU-QUÉBEC)**

➤ This was the final year of follow-up on saltwater intrusion into the Baie de Rupert. The impact study anticipated that, once the freshwater flow had dropped by 50% at the mouth of the Rupert, the freshwater-saltwater interface would move 3 to 5 km upstream and the water level at the river's mouth would drop at low tide. Follow-up studies in 2010, 2014 and 2017 confirmed the projections, and no perceptible water level fluctuations have been observed in the bay since the river's partial diversion.

**ENVIRONMENTAL FOLLOW-UP – PÉRIBONKA  
HYDROELECTRIC DEVELOPMENT  
(SAGUENAY-LAC-SAINT-JEAN)**

The year 2018 marked the 17th and final year of environmental follow-up during Péribonka development operations. The follow-up focused on several aspects, including use of the reservoir by waterfowl, tree- and shrub-planting operations, fish population dynamics and lake trout enhancement.

[Environmental follow-ups](#)



**GRI** GRI 102-40, GRI 102-42, GRI 102-44, GRI 102-47, GRI 103-1, GRI 103-2

# CONTRIBUTING TO THE ENERGY TRANSITION



Strengthening the power transmission system with a view to the energy transition. (Mauricie)

IN THIS SECTION	SOLUTIONS CONSIDERED AND EXAMPLES OF INITIATIVES TO BE IMPLEMENTED BY 2025	MATERIALITY ANALYSIS ASPECTS	STAKEHOLDERS CONCERNED
-----------------	--	------------------------------	------------------------

The ongoing energy transition sweeping the globe, which involves replacing fossil fuels by clean, affordable power, implies substantial and far-reaching changes to energy generation and consumption modes. As well as helping combat climate change, the transition presents Hydro-Québec with exciting new business opportunities, but also a host of new challenges. One such challenge: maintaining our revenues in the face of the anticipated parity, by 2025, of hydropower and solar energy costs—a state of affairs that could prompt customers to switch to solar.

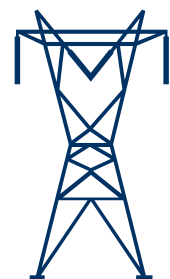
## IN THIS SECTION

- > Off-grid systems
- > Renewable energies
- > Microgrids
- > Transportation electrification
- > Electricity sales outside Québec



**1,689**

⊕ ELECTRIC CIRCUIT CHARGING STATIONS



**8,212 MW**

⊕ INTERCONNECTION EXPORT CAPACITY



UN SUSTAINABLE DEVELOPMENT GOAL AND TARGET ASSOCIATED WITH THIS CHALLENGE



⊕ SEE TARGET



GRI GRI 102-13

# The energy transition in Québec

With access to abundant and affordable zero-carbon electricity, companies based in Québec have a competitive edge over firms operating in fossil-fuel-dependent economies. Around the world, numerous organizations are attempting to combat climate change by choosing clean electricity to meet their energy needs.

At a time when the energy industry is undergoing massive change, Hydro-Québec is working to reduce its operating expenses and increase electricity sales. We are also diversifying our offering by integrating home automation and big data management, whose applications include microgrid operation.

## INTERNATIONAL ENERGY TRENDS BETWEEN NOW AND 2050

According to the 2018 *New Energy Outlook*, close to 50% of global electricity production will come from wind and solar power by 2050.

By then, the average cost of a photovoltaic system is expected to have dropped by 71% and that of a wind turbine, by 58%. The capital costs of such facilities are currently below those of new coal or natural gas plants. Energy storage system prices are also expected to drop—a situation that will encourage their use and thus optimize solar or wind generation, which is intermittent and sometimes difficult to predict.

By 2050, the rising number of electric vehicles on the road will boost global electricity demand by 9% (3,461 TWh). By giving car owners the option of lower charging rates during low-demand periods, dynamic pricing will help foster the integration of renewables.

Energy produced from coal, which currently accounts for 38% of global output, is projected to drop to 11%.

The use of natural gas to generate electricity will undergo a modest increase between now and 2050. This energy source will be increasingly used to support intermittent generation in renewable energy forms like wind or solar.

## RENEWABLE ENERGIES

For the residential sector, the price of solar power could become competitive with hydropower by 2025. If this were to come about, some customers could even become independent producers of solar power.

This new reality could have repercussions, particularly on rates. Faced with such a scenario, we would need to redistribute our supply costs (electricity generation and purchases) as well as our operating costs among all our customers.



### 2018 HIGHLIGHTS

➤ Hydro-Québec was lead partner in [TeamMTL](#), which participated in the Solar Decathlon China 2018, an international green building competition held last summer in the Chinese city of Dezhou. The joint team from McGill and Concordia universities took top honors in three categories—Architecture, Market Appeal and Communications—for its high-energy-efficiency housing prototype, as well as the third-place awards for engineering and innovation.



### EXCLUSIVE WEB CONTENT

- [The energy transition in Îles-de-la-Madeleine](#)
- [Electric power purchases for the Québec market](#)
- [Transportation electrification](#)
- [Québec Net Positive](#)





**GRI** GRI 102-7, GRI 102-13

- › We launched [Photovoltaic solar power](#), a Web page that helps consumers assess the cost-effectiveness of solar panels based on energy use, geographic location and the system’s anticipated capacity. The page also shares information on the [environmental footprint of the electricity distributed by Hydro-Québec](#).
- › We contributed to two Institut du Québec [reports](#) urging Québec companies to promote the low-carbon aspects of their products on the international market. This work has mobilized the Québec government to develop an economic strategy geared toward low-carbon expertise.



**PHOTOVOLTAIC SOLAR PLANTS IN QUÉBEC BY 2020**

Hydro-Québec is planning to build two small photovoltaic (PV) solar facilities on land owned by the company on Montréal’s South Shore. The first, which will have an installed capacity of approximately 2.5 MW and up to 10,000 PV panels, will be built on the IREQ site at Varennes. The second, with an installed capacity of close to 7.5 MW and up to 26,000 PV panels, will be built on the site of the former La Citière generating station at La Prairie. Connected to the 25-kV distribution system, the two facilities will generate enough energy to power 600 to 700 homes. Solar power delivery is expected to begin in 2020.

**Project objectives**

- › Build our expertise in PV solar power to complement our existing power generation know-how.
- › Test centralized solar power generation in Québec.
- › Seek out business opportunities in Québec or abroad with a view to long-term growth.

**THE PHOTOVOLTAIC SOLAR POWER BOOM**

Hydro-Québec’s customers represent over 4.3 million accounts, while its assets have a carrying amount of over \$75 billion. Our residential customers enjoy some of the lowest electricity rates in North America—which, for the moment, keeps other clean energies with higher operating costs from penetrating the Québec market.

**IN 2018: A WELL-OILED MACHINE**

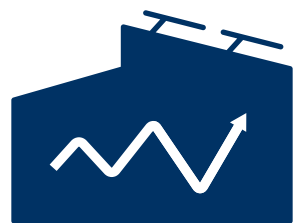
Our power generation, transmission and distribution facilities adequately ensure basic electric service, our revenues cover operating expenses, and the surplus electricity sold on the export market reaps substantial earnings.

[Portrait of electricity sales and breakdown of annual operating expenses](#) (+)

**IN 2025: SERIOUS COMPETITION**

With solar power set to become highly competitive by 2025, a certain percentage of residential customers may become independent producers of this energy form while remaining connected to the grid.

Hydro-Québec could then see its electricity sales shrink and its surpluses increase. Demand on our power system would be lower while operating and maintenance costs would remain at the same level.



(+) CHANGING COST OF SOLAR POWER SYSTEMS – RESIDENTIAL MARKET



GRI GRI 203-1

## TRANSPORTATION ELECTRIFICATION

Hydro-Québec is working to boost its transportation electrification leadership.

In personal transportation, we want to step up the rollout of the Electric Circuit, raise public awareness about the benefits of electric vehicles and continue to develop battery materials. In public transit, we're contributing financially to strategic initiatives and participating in transit authority pilot projects. As for goods transportation and our own transportation needs, we're involved in pilot projects on charging stations for vehicle fleets and are continuing to electrify our own fleet.

For the moment, our commitment to transportation electrification poses certain financial challenges, including the profitability of fast-charge stations. Compounding the situation, progress is slow on the electrification of public transit. Furthermore, with regard to goods transportation and our vehicle fleet, the electric heavy-vehicle market is practically nonexistent.

### 2018 HIGHLIGHTS


- This past year saw strong growth in the Electric Circuit, Québec's largest electric vehicle charging network, which now has 1,669 charging stations in 16 of Québec's 17 administrative regions. The rollout in Ontario continued with the addition of three new charging stations, for a total of 20. The Electric Circuit now comprises 1,689 stations in total, 146 of them fast-charge.
- We took part in a Société de transport de Laval project to acquire and assess three electric buses equipped with conductive quick-charge systems and range extenders. The buses thus present the advantages of an electric vehicle along with an operating range comparable to a hybrid vehicle.
- We put an additional \$43 million toward financing the infrastructure needed to electrify the Réseau express métropolitain (REM light-rail system).
- Our Center of Excellence in Transportation Electrification and Energy Storage (CETEES) provided support to Québec engineering consulting firm Seneca, which is developing a solution to perpetually recycle lithium-ion batteries.
- In 2018 we acquired 77 plug-in hybrid SUVs. As of December 31, our light-vehicle fleet had 294 hybrid or plug-in electric vehicles. ✓

### BACKED BY LEGISLATION

The *Act to promote the establishment of a public fast-charging service for electric vehicles* was passed in June 2018. Under the legislation, the Québec government will set the rates for the public service, by regulation, while the Régie de l'énergie will consider the revenues required by Hydro-Québec to operate the service when it sets electricity distribution rates.

The Act will offset the high investment costs and lack of profitability of EV fast-charge stations while ensuring the rapid deployment and lasting viability of the public service. It will also reconcile Hydro-Québec's actions with government policies and guidelines to reduce GHG emissions and support the energy transition.

Furthermore, the Act will have no direct financial consequences for the government or electricity consumers: the associated operating costs, which will be folded into electricity distribution rates, will thus have no impact, given the corresponding increase in electricity sales.

[Adding more fast-charge stations: a completely self-supporting project](#) 



**GRI** GRI 413-1

## MICROGRIDS

As part of the rebuilding of the downtown core in Lac-Mégantic, Hydro-Québec is establishing Québec's first [microgrid](#). It will comprise nearly 3,000 solar panels with an [installed capacity](#) of up to 900 kW and a 600-kWh storage capacity. This new grid will power some 30 commercial, residential and institutional buildings that will be equipped with demand management technology optimized by a controller. Some 200 m of power distribution lines will connect the system to the main grid, allowing us to test "islanding," or how the microgrid operates autonomously, independent of the main power system.

### A COMPREHENSIVE SOLUTION

Smart, interactive and decentralized, microgrids offer greater flexibility in meeting the power needs of a particular customer base. They can take on many roles, including:

- › Providing power should the main grid go out
- › Reducing [power demand](#) during peak periods
- › Occasionally supplying the main grid with low-cost energy
- › Quickly meeting local needs without requiring major investment

Building the microgrid, which is due to be commissioned in 2020, will expand our expertise in integrating new technologies related to solar power, energy storage and demand management. New solutions may also be explored to reduce the environmental footprint of off-grid systems, which are mainly powered by thermal generating stations. The microgrid project will further let us try out a new business model incorporating diverse renewables.

## OFF-GRID SYSTEMS

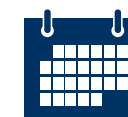
Hydro-Québec is in the process of fully or partially converting the power supply for off-grid systems to [clean energy](#). Having now been tested on a number of systems, the measures will be applied to all off-grid systems by 2025.

In 2018, off-grid systems generated 312 GWh of electricity to serve some 18,500 customers. These facilities include 23 thermal power plants (132 MW) and two hydraulic generating stations, Lac-Robertson (21.6 MW) and Menihek (17 MW). Menihek is owned by a third party.



### 2018 HIGHLIGHTS

- › With a view to converting the Obedjiwan thermal power plant to forest biomass cogeneration, we held talks with the Atikamekw community and a business partner to assess the various implementation options. (Mauricie)
- › We now operate a system to recover waste heat from the Îles-de-la-Madeleine thermal plant and use it to heat buildings and water at the Centre intégré de santé et de services sociaux des Îles (CISSS). The initiative has resulted in 1,555 fewer tonnes of GHG emissions (t CO<sub>2</sub> eq.) per year, or the equivalent of emissions from 457 light vehicles. (Gaspésie-Îles-de-la-Madeleine).



### OFF-GRID SYSTEM DEVELOPMENT PLAN



### MAP OF OFF-GRID SYSTEMS



**GRI** GRI 102-13

**BUILDING SUSTAINABILITY INTO EVERYDAY LIFE**

*The energy transition on the islands will bring with it numerous economic and environmental gains. The fact that the power station will only be used occasionally will cut annual fuel consumption by 40 million litres. This will reduce GHG emissions by 130,000 t CO<sub>2</sub> eq. per year—or 94%—even taking into account power station operations.*

**Patrick Labbé, Manager – Innovation, Major Projects and Conversion, Hydro-Québec Distribution**

**+ FULL TESTIMONIAL**



**THE ENERGY TRANSITION IN ÎLES-DE-LA-MADELEINE**

Îles-de-la-Madeleine’s dependence on oil—40 million litres of oil per year are needed to generate electricity ✓—is coming to an end. Starting in 2025, the islands will be connected to the main grid in the Gaspésie by a 225 km underwater link: a reliable solution that will cut the area’s GHG emissions by 94%. The thermal power plant that currently supplies the islands will be kept as a backup to ensure reliable service and uphold Hydro-Québec’s commitment to preserving local jobs.

Another project, the Dune-du-Nord wind farm (6.4 MW), will be carried out by Valeco Énergie Québec. Wind power deliveries are slated to begin in spring 2020 and will cover a 20-year period.

Still on the islands, we are partnering with the community to build a microgrid that will incorporate other clean energies, energy storage units and tools for managing buildings’ energy consumption. A committee composed of representatives from Hydro-Québec, Transition énergétique Québec and the municipality of Îles-de-la-Madeleine has been established for this purpose.



A small thermal power plant is operated on Île d’Entrée, Îles-de-la-Madeleine.

**THE ENERGY TRANSITION IN NUNAVIK**

Nunavik’s 14 Inuit villages are powered by diesel-fired thermal generating stations, unconnected to Hydro-Québec’s main grid, that thus constitute off-grid networks. The majority of them are due to transition to cleaner power sources.

[The energy transition in Nunavik](#) **+**

**EXCLUSIVE WEB CONTENT**

- Energy transition – off-grid systems**
- [Connection of the village of La Romaine and Unamen Shipu](#)



# The energy transition outside Québec

For some 20 years now, Hydro-Québec has been selling competitively priced, zero-carbon electricity on wholesale markets in the U.S. Northeast. Québec hydropower offers a dual advantage to markets outside the province: reduced GHG emissions and very stable prices.

## SOLUTION FOUND

Neighboring Canadian provinces and American states are seeking to reduce their dependence on fossil fuels like oil, coal and natural gas. For Hydro-Québec, North America's largest clean-energy producer, Québec electricity represents a real solution for preserving air quality in the U.S. Northeast and a prime business opportunity.

The advent of smart and interconnected grids is helping to optimize management of renewables like solar and wind power, whose output is intermittent and sometimes hard to predict. Still, despite our ongoing efforts in this area, large-scale energy storage technologies are as yet unable to take over in the absence of wind or sun. Pairing hydropower with a smart grid, however, makes this possible. A hydroelectric generating station produces electricity on command and, when connected

to a smart grid, will be able to meet the real-time energy needs of customers located hundreds of kilometres away.

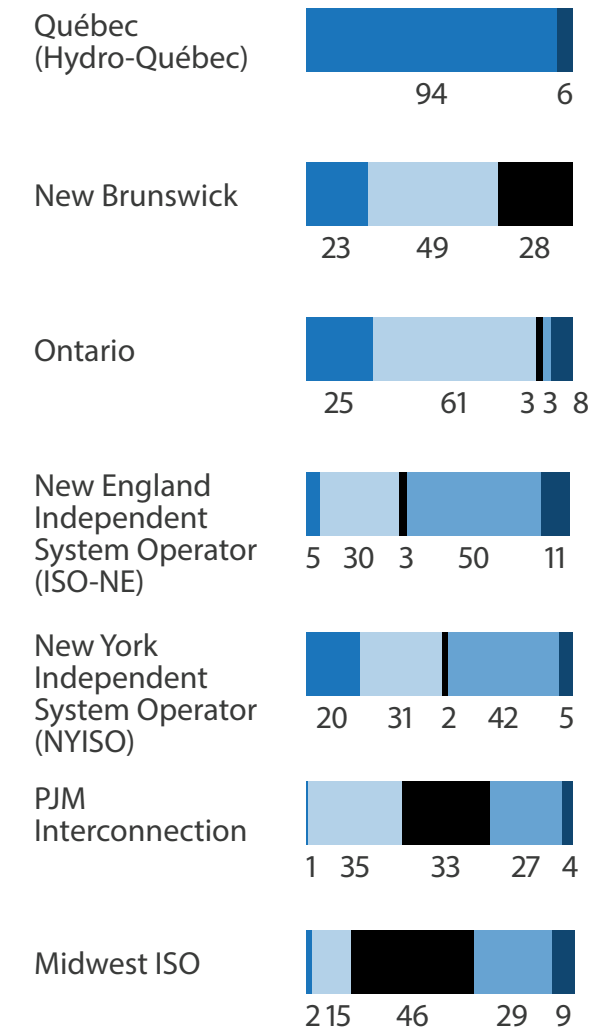
## ELECTRICITY SALES OUTSIDE QUÉBEC

### 2018 HIGHLIGHTS

➤ We teamed up with the UN Sustainable Development Solutions Network and Evolved Energy Research to produce a [study](#) on the deep decarbonization of energy systems in the U.S. Northeast (New York and New England). The goal of the study was to develop scenarios for transitioning to a low-carbon economy by 2050 as well as assess the potential cost savings of working with Hydro-Québec.

### EMISSION FACTORS IN THE MAIN EXPORT MARKETS, 2018

## MAIN EXPORT MARKET ENERGY MIXES (%)



■ Hydroelectric ■ Nuclear ■ Coal and oil  
■ Natural gas ■ Other renewables

Overall total and sum of subtotals may differ due to rounding.

Sources: Independent Electricity System Operator (IESO), Énergie NB Power Annual Report 2017–2018 and eGRID 2018.



**GRI** GRI 102-40, GRI 102-42, GRI 102-44, GRI 102-47, GRI 102-48, EU2, GRI 103-1, GRI 103-2

# BALANCING ELECTRICITY SUPPLY AND DEMAND



The area around Romaine-2, an integral part of the Romaine complex, our newest hydroelectric development. (Côte-Nord)

IN THIS SECTION

SOLUTIONS CONSIDERED AND EXAMPLES OF INITIATIVES TO BE IMPLEMENTED BY 2025

MATERIALITY ANALYSIS ASPECTS

STAKEHOLDERS CONCERNED

To meet higher demand in winter, Hydro-Québec needs a secure, reliable electricity supply. Optimizing the use of our generating, transmission and distribution facilities is a key factor in ensuring security of supply and sustainable development.

## IN THIS SECTION

- > Electricity supply
- > Energy efficiency initiatives
- > Energy efficiency of buildings and facilities
- > Demand response
- > Electricity generated and purchased
- > Project portfolio
- > Off-grid systems
- > Demand forecasting
- > Electricity sales



**99.8%** ✓

⊕ POWER DELIVERED TO CUSTOMERS GENERATED FROM RENEWABLE SOURCES

**31,749 GWh** ✓

⊕ VOLUME OF ELECTRICITY PURCHASES OUTSIDE QUÉBEC



UN SUSTAINABLE DEVELOPMENT GOAL AND TARGET ASSOCIATED WITH THIS CHALLENGE



⊕ SEE TARGET



GRI EU10

# Electricity supply plan

Hydro-Québec Distribution filed the 2018 progress report on its Electricity Supply Plan 2017–2026 with the Régie de l'énergie. The report outlines the situation in terms of balancing energy and power supply and demand between 2019 and 2026.

This update includes energy and power demand forecasts as well as the existing and planned means for filling them.


## DEMAND FORECASTING

Hydro-Québec takes global warming into account when planning its activities, particularly with respect to demand forecasting. Energy needs are projected to rise by 2026, but not enough to completely eliminate electricity surpluses. Moreover, demand response and dynamic pricing programs, as well as the proposal submitted to the Régie de l'énergie to interrupt consumption resulting from the use of cryptography as applied to blockchains, will partly offset the anticipated increase without reducing the capacity deficiency.

Historically, Hydro-Québec has doubled its electricity generation every 10 years. Power demand in Québec, which amounts to some 170 TWh per year, has nonetheless been stable since 2008 despite the slight increase in the number of customer accounts.

## 2018 HIGHLIGHTS

- Short-term energy purchases of about 0.5 TWh were made at the start of the year. These purchases were relatively low in February and March due to milder weather.
- The Régie de l'énergie approved the connection of the village of La Romaine to the main grid and a 6 MW power supply contract as part of a wind power project in Îles-de-la-Madeleine.

-  [+](#) CAPACITY BALANCE (MW)
- [+](#) ENERGY BALANCE (TWH)
- [+](#) ELECTRICITY SALES AND NUMBER OF CUSTOMER ACCOUNTS IN QUÉBEC

## 2017–2018: A WINTER OF FLUCTUATING TEMPERATURES

Power demand reached its peak on December 28, 2017, at 38,204 MW.

On January 22, 2018, power demand hit a record high of 39,240 MW. Each time the temperature drops by one degree in Québec, electricity consumption rises by about 400 MW, or roughly the amount of power used by 90,000 homes.

[December 1, 2017 to January 25, 2018](#) [+](#)

## EXCLUSIVE WEB CONTENT

### Demand forecasts

- [Understanding power and energy](#)



GRI EU10

## DEMAND RESPONSE

Hydro-Québec uses different strategies to reduce or shift peak consumption. By enabling us to reduce power demand and short-term electricity purchases outside Québec, these strategies help keep supply costs down.

In addition to our demand response programs, we're counting on shaving off about 3,000 MW from peak power demand through energy savings achieved by 2025–2026, as well as some 500 MW through residential dual energy.

### INITIATIVES TO REDUCE POWER DEMAND

In winter, Hydro-Québec's grid is subject to higher demand due to water and space heating needs, particularly at certain times of the day. For this reason, we've introduced a range of measures for our different customer categories that are designed to help lower demand.

[Business customers](#) (+)

[Residential customers](#) (+)

### NEW OFFERING: DYNAMIC PRICING ON AN OPT-IN BASIS

In winter 2019–2020, Hydro-Québec will introduce two new dynamic rate offerings: the base rate with winter credit and the Flex rate. Registration will be on an entirely voluntary basis; customers who are not interested can simply opt to keep their current base rate. In the first year, 20,000 randomly selected customers will be invited to take part and given access to tools.

Both dynamic pricing offerings are designed to help customers save money during the winter period (December 1 to March 31). In either case, participants will be asked to modify their electricity use during critical peak events between 6 and 9 a.m. and 4 and 8 p.m., for a maximum of 100 hours per winter.

The base rate with winter credit is risk-free and represents potential savings. Participants keep their base rate and receive a credit of \$0.50 per kWh curtailed during critical peak events.

As for the Flex rate, customers who enroll will pay less than the base rate for the entire winter period outside of critical peak events. However, during these events they will pay more than the base rate: \$0.50 per kWh consumed. The Flex rate represents a greater potential for savings than the winter credit—but customers will have to be vigilant: if they don't change their energy habits during critical peak events, they might actually see their bill increase.

### COMPARISON OF DYNAMIC RATE OFFERINGS WITH THE BASE RATE

	BASE RATE	BASE RATE WITH WINTER CREDIT	FLEX RATE
Summer period*	Base rate price	Base rate price	Base rate price
Winter period,** <b>outside</b> of critical peak events	Base rate price	Base rate price	Price lower than base rate
Winter period,** <b>during</b> critical peak events (Max. 100 hours/winter)	Base rate price	Base rate price minus credit of 50¢ per kWh curtailed	Price higher than base rate: 50¢ per kWh consumed
Impact on bill in relation to base rate	–	Potential for savings. Risk-free: the bill can only go down.	Potential for substantial savings. The bill can increase if consumption is not reduced during the critical peak events.

\*Summer period: April 1 to November 30. \*\*Winter period: December 1 to March 31.





GRI EU10

**2018 HIGHLIGHTS**

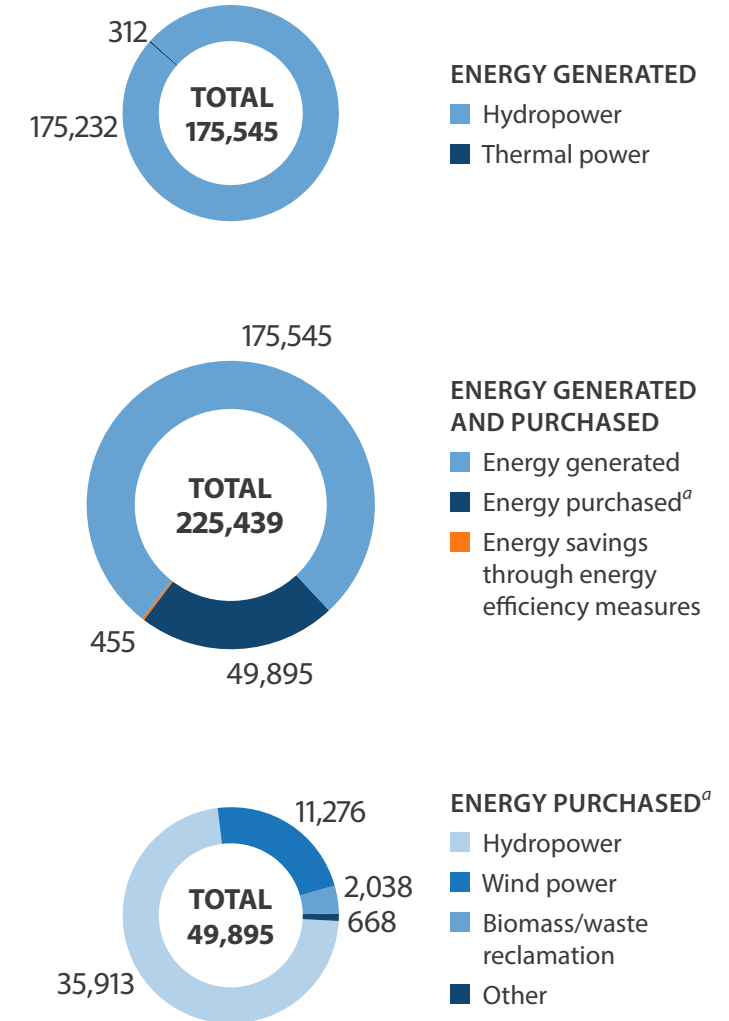
- We pursued our efforts to raise public awareness about electricity use during winter. On very cold days, reminders were published online and in print media as well as broadcast on the radio.
- We included promotional flyers on dual energy with our electricity bill mailouts, updated the flyer for new homeowners who use dual-energy systems and revamped the dual energy [Web page](#).

- Winter 2017–2018 saw 404 projects registered for the Demand Response Program ✓ for commercial and institutional customers and small-to-medium-sized industries—an increase from 258 the previous winter. The projects shaved 291 MW from winter-period power needs. ✓
- We evaluated the potential of efficient electric technology solutions for the mining industry and conducted a first study on the energy impacts of Industry 4.0 (valorization of usage data measured on the equipment of small- and medium-sized industries).

**HYDRO-QUÉBEC DISTRIBUTION'S LONG-TERM NON-HERITAGE INTEGRATED SYSTEM SUPPLY (UNDER CONTRACT)**

ENERGY SOURCE	NUMBER OF CONTRACTS SIGNED ✓	PEAK CAPACITY (MW) ✓	ANNUAL ENERGY (TWh)	
			2019	2026
Biomass	21	338	1.9	2.5
Wind power	38	1,486	11.3	11.3
Cogeneration	1	8	0.1	–
Small hydro	9	122	0.5	0.6
Other sources	3	600	3.3	3.7
Hydro-Québec Production	3	500	0.1	0.2
<b>TOTAL</b>	<b>75</b>	<b>3,055</b>	<b>17.1</b>	<b>18.4</b>

**MEETING ENERGY NEEDS – 2018 (GWh) ✓**



a) Includes purchases from Churchill Falls (Labrador) Corporation Limited and independent power producers, including McCormick generating station, in which Hydro-Québec holds a 60% interest.

Overall total and sum of subtotals may differ due to rounding.

These figures include renewable energy certificates for the output of Hydro-Québec Production's generating stations that were sold to third parties. They exclude purchases of wind, hydraulic and biogas energy for which such certificates were sold.



GRI EU10



Daniel-Johnson dam, a proud symbol of Québec’s hydropower expertise.

➤ The Supreme Court of Canada ruled in our favor, confirming that the purchase price stipulated in the contract signed in 1969 with CF(L)Co does not need to be revised.

### HYDROPOWER GENERATION

Hydropower accounts for 94% of our energy portfolio, alongside other renewables. Our supply is complemented by contracts with independent power producers drawing on other sources like wind, biomass and small hydro.

## GENERATION, PURCHASES AND OTHER SOURCES OF SUPPLY

Our heritage pool of electricity and extensive supply portfolio enable us to meet capacity and energy demand. We currently have a number of contracts to deliver electricity generated from a range of sources: wind, biomass and small hydro.

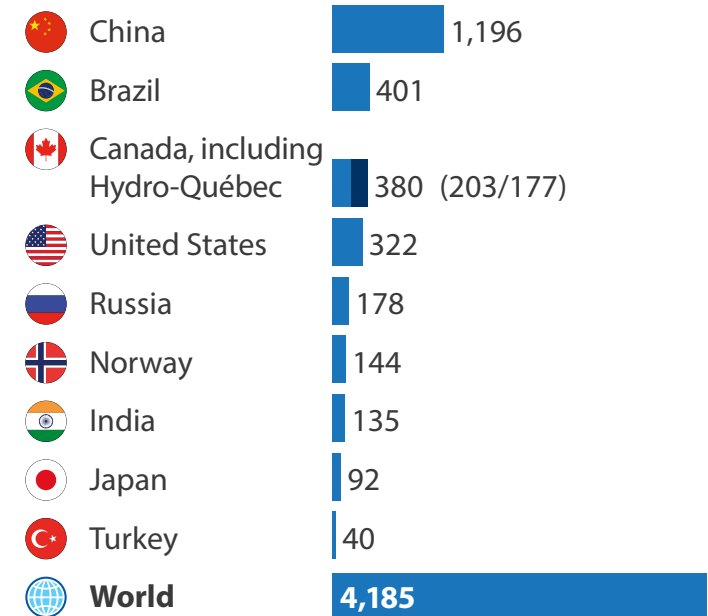
### 2018 HIGHLIGHTS

- The Mont-Sainte-Marguerite wind farm (147.2 MW) in the Chaudière-Appalaches region was commissioned.
- The Nicolas-Riou wind farm (224.3 MW) in the Bas-Saint-Laurent region was also commissioned.

### APUIAT WIND FARM

In 2018, Hydro-Québec and the Apuiat project partners—Société en commandite Apuiat, comprised of participating Innu communities, and Boralex Inc.—pursued their plan to build a 200-MW wind farm, considered by all as a win-win agreement. Parts of the discussions were subject to media coverage. Negotiations were finalized in August; however, the project was put on hold until additional energy needs arise.

### HYDROPOWER GENERATION:<sup>a</sup> WORLD LEADERS IN 2017 (TWh)



a) Includes electricity generated by pumped storage plants.

Source: *Hydropower Status Report 2017*, International Hydropower Association.



EXCLUSIVE WEB CONTENT

#### Sources of supply

- [Electric power purchases – Québec market](#)
- [Electricity supply contracts in force in Québec](#)
- [Self-generation](#)
- [Renewable energy sources: current state of knowledge](#)



**GRI** GRI 302-4

# Energy efficiency

In keeping with its approach of recent years, Hydro-Québec is working to maintain an energy efficiency culture and address some of the growth in demand through energy-saving measures.

In our residential market, we encourage customers to use electricity responsibly and adopt energy-saving habits. In our business market, we continue to play an advisory role and assist our customers with their energy efficiency initiatives, using a flexible approach that lets them incorporate new products and innovative technologies.

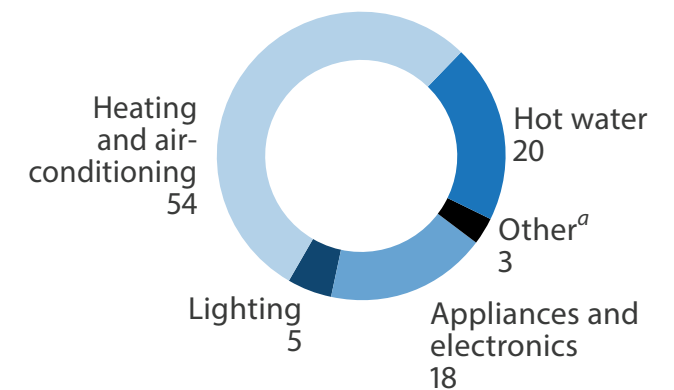
Our energy efficiency programs help us attain the targets set in the Transition énergétique Québec (TEQ) 2018–2023 Energy Transition Master Plan.

## RESIDENTIAL CUSTOMERS



- We rolled out initiatives like the Refrigerator Replacement Program for Low-Income Households to complement TEQ’s Éconologis program.
- We continued to promote water- and energy-saving products with residential customers, municipalities, municipal housing offices and rental property owners.
- We maintained our Energy Efficiency Retrofit Program for Low-Income Households and concluded three new agreements with various municipalities. Our aim: reduce electricity bills through renovations to the thermal envelope (replacing doors and windows, insulating walls and roofs, installing heat recovery systems) and basic energy efficiency measures (replacing thermostats, lighting products and washing machines).

## AVERAGE ANNUAL ENERGY CONSUMPTION BY QUÉBEC HOUSEHOLDS, BY TYPE OF USE (%)



a) This category includes devices such as pool equipment, sump pumps and woodworking tools.

## NEW ANNUAL ENERGY SAVINGS – ENERGY EFFICIENCY INITIATIVES (GWh)

	2015	2016	2017	2018 ✓
Residential customers	178	202	200	207
Business customers	391	330	321	245
Off-grid systems	1	2	3	3
Energy savings	570	534	524	455




GRI GRI 302-4

## PARTNERING WITH TRANSITION ÉNERGÉTIQUE QUÉBEC

Hydro-Québec is taking part in the Transition énergétique Québec (TEQ) [Plan directeur en transition, innovation et efficacité énergétiques du Québec 2018-2023](#) (Energy Transition Master Plan). Under the partnership, the goals and budgets of our energy efficiency programs will remain stable throughout the period targeted by the plan. We will also cover 10% of the Plan's budget, with the remainder to come from other government departments and power distributors.

Hydro-Québec and TEQ have joined forces to harmonize existing programs and measures and consider new initiatives to develop. Though hydropower is Québec's prime source of renewable energy, various obstacles need to be eliminated so that it can play an even bigger role. Peak load management, one such obstacle, has hindered the phase-out of oil in the residential market.

[Some of Hydro-Québec's contributions to TEQ's efforts in 2018](#) 

## OFF-GRID SYSTEMS

During winter 2018–2019, Hydro-Québec pursued its efforts to encourage residential customers who are powered by off-grid systems to save electricity in winter and during peak periods, in particular.

### 2018 HIGHLIGHTS

- We continued our program to replace lighting products in the buildings of Nunavik-based business customers. By late 2018, work had been completed in six villages, with the remaining villages to be completed in 2019. (Nord-du-Québec)
- Homes in four Nunavik villages were audited with a view to establishing an energy efficiency initiative action plan. (Nord-du-Québec)

## BUSINESS CUSTOMERS

### 2018 HIGHLIGHTS

- The city of Trois-Rivières participated in the [Demand Response Program](#). The city received \$175,420 in financial assistance to adopt energy-saving methods during winter peak periods. (Mauricie) ✓

- A number of business customers also registered projects to introduce continuous-improvement practices based on ISO 50001. The 20 projects under way ✓ aim to eliminate electricity waste by specifically targeting operational changes (for example, modifying work habits).
- Horticultural LED lighting products (photosynthesis) were added to the Efficient Farming Products Program. To help greenhouse growers choose more efficient products, we also helped set the energy performance criteria for a new category of lighting products launched in 2018 by the DesignLights Consortium®. The program component for fans, which are widely used in agriculture, was also expanded.

### EXCLUSIVE WEB CONTENT

#### Energy efficiency

- [The Right Moves](#)
- [Energy Wise \(residential customers\)](#)
- [Energy efficiency programs \(business customers\)](#)
- [Québec's 2018–2023 energy transition, innovation and energy efficiency master plan](#)



 ENERGY CONSUMPTION BY SECTOR  
IN QUÉBEC



**2018 HIGHLIGHTS**

**ENERGY SAVINGS**

- › We continued to implement energy efficiency measures in our buildings, replacing ventilation and lighting systems at the end of their service life with more efficient models.
- › Since 1992, we've cut the energy consumption of our administrative buildings by 43%, for total savings of \$138 million.

**CAPACITY GAINS**

- › We reduced winter demand by 5,941 kW in 41 administrative buildings. ✓
- › Replacing a generating unit at the Beauharnois facility boosted capacity by 14.2 MW and yielded 18 GWh of additional energy annually.

**ENERGY EFFICIENCY RESULTS – ADMINISTRATIVE BUILDINGS (kWh/m<sup>2</sup> gross)**

	2015	2016	2017	2018 ✓
Average energy consumption	231	229	230	229

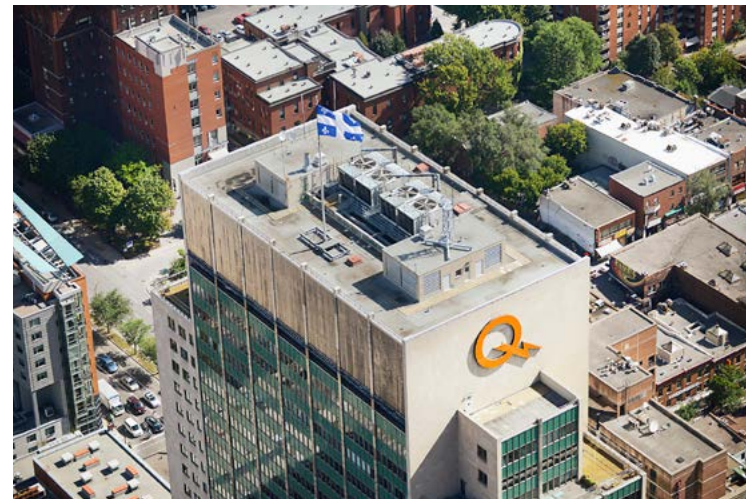
**THE FRESK TOWER:  
AN ECO-FRIENDLY BUILDING**

The 20-storey Fresk tower is a residential building located in Québec's capital. During construction, Hydro-Québec provided the developer with financial assistance to build in energy efficiency measures, including innovations in heating, ventilation and air conditioning.

On an annual basis, the tower consumes 607,690 kWh less than a reference building, or roughly the electricity use of 23 single-family homes. The centralized geothermal heat pump used for heating and cooling contributes significantly to the building's overall energy efficiency.

Other green features include:

- › Heat recovery mechanisms for the heating, ventilation and air-conditioning systems
- › Variable-speed drives for heating and cooling pump flow control
- › Efficient LED indoor lighting in common areas (main hall, corridors, parking garage, gymnasium) and housing units
- › Occupancy sensors in certain rooms to automatically switch lights on or off



Édifice Jean-Lesage, Hydro-Québec's head office, in downtown Montréal.

**ENERGY SAVINGS – OUR BUILDINGS AND FACILITIES**

We take concrete steps to reduce energy consumption by our buildings and facilities. The savings achieved mainly relate to lighting, ventilation and energy recovery.

We also rehabilitate and refit our generating stations to increase capacity and output, and implement measures to reduce energy losses on our transmission system. Together, these efforts enable us to generate and deliver more energy for less.



**GRI** GRI 203-2, GRI 413-2

**PROJECT PORTFOLIO 2018**



Aerial view of Chamouchouane substation

The Chamouchouane–Bout-de-l’Île project has two main components: construction of a 400-km, 735-kV line supported by some 1,000 towers between Chamouchouane substation in Saguenay–Lac-Saint-Jean and the new Judith-Jasmin substation in Terrebonne; and the relocation of a short, 19-km segment of a 735-kV line to Bout-de-l’Île substation in Montréal. The work will also entail expanding Chamouchouane substation.

The completed project will strengthen the grid between Saguenay–Lac-Saint-Jean and the greater Montréal area. It will also boost operating flexibility and considerably limit electricity losses on the transmission system.

# 735-kV Chamouchouane–Bout-de-l’Île project

**STATUS**

Under construction

**LINES AND SUBSTATION UNDER CONSTRUCTION – 735 KV**

- > Line section 2 – Blanc réservoir–Taureau réservoir
- > Line section 4 – Saint-Zénon–Rawdon

- > Judith-Jasmin substation (735/120/25 kV) – 735-kV section commissioned in fall 2018, followed by the 120-kV section in spring 2019

**LINES COMPLETED – 735 KV**

- > Section 1 – Chamouchouane substation–Blanc réservoir

- > Section 3 –Taureau réservoir–Saint-Zénon
- > Section 5 – Rawdon–Terrebonne
- > Section 6 – Circuit 7017–Bout-de-l’Île (portion commissioned)

**LINE RECONSTRUCTION – 315 KV**

Line segment between Terrebonne and Montréal (Bout-de-l’Île substation portion commissioned)

**SUBSTATION EXPANSION – 735 KV**

Chamouchouane substation

**INVESTMENT**

\$1.3 billion

**REGIONS**

Saguenay–Lac-Saint-Jean, Mauricie, Lanaudière, Laurentides, Montréal

**CONSTRUCTION**

2015–2019

**ECONOMIC SPINOFFS**

Estimated at \$1.1 billion



**GRI** GRI 203-2, GRI 307-1, GRI 413-2

## 2018 HIGHLIGHTS

- › Meetings continued with the Lanaudière and Atikamekw liaison committees.
- › Project news bulletins were sent out in various regions. (Saguenay–Lac-Saint-Jean, Mauricie, Lanaudière)
- › Over 500 residents, employees and city councillors from Terrebonne attended the Judith-Jasmin substation open house.
- › Transmission line jobsite visits were carried out with Matawinie elected officials.
- › We were interviewed on local media regarding the dismantling of the 315-kV lines in Terrebonne.
- › Radio broadcasts reminded local land users of the importance of safety near jobsites.
- › Updates were made to the project Web site, particularly the “Work progress by region” section.
- › No legal noncompliance notices were received in 2018.

## SUSTAINABILITY ISSUES RELATED TO THE PROJECT

- › Work was carried out in five administrative regions (18 municipalities, towns or parishes, seven unorganized territories, nine MRCs or agglomerations and one metropolitan community) and in cooperation with one Innu community and two Atikamekw communities.
- › Environmental commitments were acted upon and community relations activities continued during construction.

- › We stepped up our occupational health and safety (OHS) initiatives over the course of the year.
- › Preventive stoppages were carried out to analyze OHS practices and ensure jobsite safety.

## LISTENING TO THE COMMUNITY

- › Work was interrupted during the fall hunting season.
- › Measures were pursued to promote harmonious coexistence between the jobsite and local snowmobile/ATV clubs, particularly in Lanaudière and Haute-Mauricie.

## EXAMPLES OF ENVIRONMENTAL MANAGEMENT ACTIVITIES IN 2018

### Mitigation measures

- › The temporary dock on the Rivière des Prairies was dismantled and the site, restored.
- › Compensation was awarded for loss of woodlands in the Basses-Terres du Saint-Laurent (32.5 ha of plantations and 5.5 ha of forestry operations).

### Environmental monitoring

- › A protocol was developed to monitor stray voltage (four farms targeted).
- › We drafted a scientific paper presenting findings from the follow-up on American cancer-root (a special-status plant) in the Lanaudière.



^^ Construction of the new transmission line near Highway 25.



^ Work under way on the tower near Saint-Roch-de-l'Achigan.



**GRI** GRI 203-2, GRI 204-1, GRI 307-1, GRI 413-2

# Romaine complex

**STATUS**

Under construction

**INVESTMENT**

\$6.8 billion  
(construction costs)

**REGION**

Côte-Nord

**CONSTRUCTION**

2009–2021

**INSTALLED CAPACITY**

1,550 MW

**PLANNED AVERAGE ANNUAL OUTPUT**

8.0 TWh

**ECONOMIC SPINOFFS**

\$3.5 billion for Québec as a whole, including \$1.3 billion for the region

**PROGRESS IN 2018**

**Romaine-1 generating station – 270 MW**

(commissioned in 2015)

- > Site reforestation

**Romaine-2 generating station – 640 MW**

(commissioned in 2014)

- > Site reforestation

**Romaine-3 generating station – 395 MW**

(commissioned in 2017)

- > Des Murailles workcamp dismantling begun
- > Site reforestation


**Romaine-4 generating station – 245 MW**

(to be commissioned in 2021)

- > Diversion tunnel impounded
- > Cofferdams built
- > Water intake and spillway: excavation completed and concrete pouring begun
- > Continuation of generating station excavation
- > Reservoir clearing

**2018 HIGHLIGHTS**

- > Job creation: 1,062 person-years (Côte-Nord workers accounted for 48%, Innu workers for 14%). At peak construction, Mista workcamp housed 1,165 workers.
- > Annual investments (including financing): \$349 million
- > Contracts awarded in the region: \$30 million
- > Four legal noncompliance notices were received; corrective measures have been carried out. ✓
- > 20 government approvals were received.
- > Some 650,000 trees were planted on Romaine complex sites.

 **VIDEO: A TRIBUTE TO INNU WORKERS ON THE ROMAINE JOBSITE (in French only)**





## EXAMPLES OF ENVIRONMENTAL MANAGEMENT IN 2018

### MITIGATION MEASURES

#### Lake trout

Third springtime seeding of 11,700 juvenile lake trout (aged between one and two years) in Romaine 1 reservoir

#### Arctic char

As a preservation method, Arctic char from two lakes were transferred to fishless water bodies prior to impoundment of Romaine 4 reservoir.

#### Landlocked salmon

The enhancement program for landlocked salmon in the Romaine-4 area continued with the catch of 40 spawners and incubation of 13,440 eggs. The area is to eventually be seeded with some 8,000 fry.

#### Wetlands

Wetlands were developed in the Romaine-3 area (Masseku and Du Mista ponds) to compensate for the loss of other wetlands during reservoir impoundment.

#### Golden eagle

Two golden eagle nests, one of which contained an adult and a chick, were noted during the waterfowl survey (reservoir flyover).

#### Beaver

Beaver colonies were surveyed in October in the southern part of Romaine 4 reservoir along the Romaine complex access roads. A total of 32 beavers from 13 colonies were trapped and handed over to the community of Ekuanitshit.

#### Mercury

The Ekuanitshit technical and environmental committee was presented with the results of the first fish mercury level study following impoundment of Romaine 1 and 2 reservoirs. Mercury level monitoring began in 2017. The findings will be used to prepare literature and recommendations regarding fish consumption.

### ENVIRONMENTAL FOLLOW-UP

#### Fish rescue

After the spring discharge ended at the Romaine-3 spillway, fish were captured and reintroduced into residual depressions in the dried-up section of the riverbed along the main stretch of the Romaine. Some 200 fish, mainly brook trout and suckers, were moved during the operation.

#### Atlantic salmon

Ongoing actions include the following:

- › The yearly downstream migration study, ongoing since 2013, estimated the number of smolts spawned in the Romaine and its tributary, the Puyjalon, at close to 12,000 in 2018. These findings are comparable to last year's. Given that numbers have now remained low and worrisome for three years running (i.e., ever since the Romaine complex's first generating station was commissioned in late 2014), operating instructions at Romaine-1 have been tightened.
- › The upstream migration study, conducted for the fourth time since 2010, reported 162 adult salmon in the Romaine, which is comparable to the 2015 findings and higher than those of 2010 and 2013.
- › A total of 127 salmon nests were counted: 64 in the Romaine and 63 in the Puyjalon. This is the lowest number of nests in the Romaine since 2015, but is still more than estimated numbers under natural conditions.
- › During telemetric monitoring, 111 juveniles were caught, tagged with transponders and released in a rearing habitat fitted with 296 telemetric antennae downstream of Romaine 1. This study monitors the behavior of juvenile salmon, particularly in terms of temperature and flow variations.

#### Forest-dwelling woodland caribou

- › Telemetric monitoring of forest-dwelling woodland caribou continued and the study area population was surveyed. Despite the greater number of individuals identified, survival and recruitment indices suggest that the Québec population of this vulnerable species is declining and remains fragile. The apparent increase is mainly due to the very large herd observed at the northern limit of the study area.



## PROJECT PORTFOLIO 2018

## Dismantling De la Reine substation

Built in 1894 in Québec's Saint-Roch neighborhood, the 69/12-kV De la Reine substation, until now Canada's oldest in use, ceased operations after 122 years. The substation was initially connected to Montmorency generating station; part of its current went toward lighting Dufferin Terrace. It had overhead lines and, later, underground lines linking it to Québec-1 substation. De la Reine played a key role in the city's electrification.

### 2014–2017

- › A built- and technological-heritage study identified certain aspects of the substation as worth preserving.
- › The substation's condition was documented on video. Footage was shot of the building exterior, equipment installed on the grounds, the oil pumping station for the underground lines, and the control room and indoor equipment.
- › The overhead lines were dismantled in 2017.

### AUGUST 2018 SUBSTATION BUILDING FOUNDATION REMOVED

- › The foundation of a soap-and-candle factory built around 1830 was unearthed, as were those of a number of dwellings and latrines dating back to the mid-19th century (1840–1850).
- › Numerous everyday items also came to light: an inkwell, a pipe, utensils, bottles, crockery, a chamber pot, a musket ball and so on.
- › The objects found will help piece together the various phases of the site's occupation.

### NOVEMBER 2018 END OF SITE RESTORATION

- › Site restoration was subject to strict environmental monitoring to control soil quality and ensure proper management and follow-up of the excavated contaminated soil.
- › The soil contamination observed was mainly due to leakage from transformers and circuit breakers.
- › Some 15,000 tonnes of soil contaminated largely by petroleum hydrocarbons were decontaminated.



PROJECT FACT SHEET

## Dismantling Tracy generating station

Construction of Tracy thermal generating station, begun by the Shawinigan Water and Power Company in 1962, was completed by Hydro-Québec in 1968. The plant had four immense oil-fired steam generators and four generating units, for an installed capacity of 600 MW. In the beginning, it helped meet the province's growing power needs; later, it was used as a backup energy source during winter. The facility was gradually decommissioned between 2010 and 2011. The completion of dismantling in 2018 marked a new life for this outstanding 650,000-m<sup>2</sup> site, which is served by a highway, a railway and the St. Lawrence.

When the plant was shut down, Hydro-Québec and the city of Sorel-Tracy reached an agreement as to the site's future. The city asked Hydro-Québec to preserve some of the infrastructure—particularly the powerhouse and pumping station foundations—for possible reuse in an industrial-port zone redevelopment initiative. This has helped Hydro-Québec avoid major demolition costs, in addition to preserving bank stability and minimizing the impact on the environment and aquatic habitats. Local businesses were also able to benefit from the recycling of tonnes of steel. Currently, various development scenarios are being proposed for the site, any of which will enhance the city's attractiveness to visitors.

TRACY THERMAL GENERATING  
STATION: DISMANTLING TIMELINEVIDEO: CENTRALE DE TRACY:  
TOUTE UNE ÉCOLE ! (in French only)



**GRI** GRI 102-40, GRI 102-42, GRI 102-44, GRI 102-47, GRI 103-1, GRI 103-2

# CONTINUING TO BOOST PROFITABILITY AND PURSUE TECHNOLOGICAL INNOVATION



Our Center of Excellence in Transportation Electrification and Energy Storage. (Varenes)

IN THIS SECTION

SOLUTIONS CONSIDERED AND EXAMPLES OF INITIATIVES TO BE IMPLEMENTED BY 2025

MATERIALITY ANALYSIS ASPECTS

STAKEHOLDERS CONCERNED

Our *Strategic Plan 2016–2020* includes the following objective: “Lay the groundwork to double our revenue over the next 15 years so as to increase profits.” Achieving this goal hinges on exploring new growth avenues: increasing exports, acquiring assets or stakes outside Québec, commercializing our innovations and boosting the capacity of our generating fleet.

## IN THIS SECTION

- > Financial results
- > New market development
- > R&D
- > Developing partnerships
- > Hydro-Québec’s technological vision
- > Long-term export contracts



**\$13.9 billion**

⊕ TOTAL ELECTRICITY SALES



**1,161** ✓

⊕ NUMBER OF PATENTS HELD OR PENDING



UN SUSTAINABLE DEVELOPMENT GOAL AND TARGET ASSOCIATED WITH THIS CHALLENGE



⊕ SEE TARGET



# Financial results

In 2018, we posted net income of \$3.19 billion, allowing us to pay our shareholder, the Québec government, a dividend of \$2.39 billion. This result is due to the solid performance shown in all our lines of business, both in Québec and in outside markets, as well as to the sale of a controlling interest in our subsidiary TM4 to Dana Incorporated.

Our net electricity exports reached a historic volume of 36.1 TWh and contributed \$744 million to net income. In terms of percentages, they represented 17% of our sales volume and 23% of our net income. As a result of an effective sales strategy, the smooth operation of our generating and transmission facilities and high runoff, net exports increased by 1.7 TWh over the previous record, set in 2017.

## 2018 HIGHLIGHTS

- Revenue from electricity sales in Québec was \$12,134 million (\$11,763 million in 2017).
- Revenue from electricity sales outside Québec was \$1,731 million (\$1,651 million in 2017).

- Net income totaled \$3,192 million (\$2,846 million in 2017).
- We paid a dividend of \$2,394 million to the Québec government (\$2,135 million in 2017).



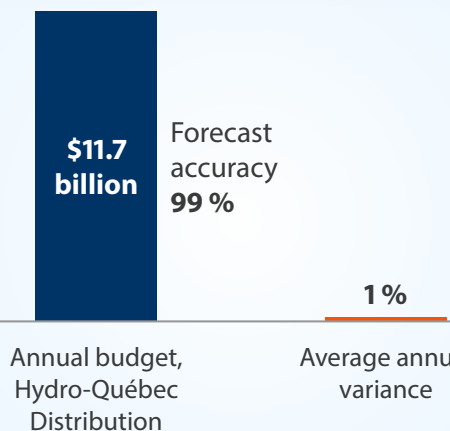
### CALCULATING THE DIVIDEND

Under the *Hydro-Québec Act*, the dividend to be paid by Hydro-Québec is declared once a year by the Québec government, which also determines the terms and conditions of payment. For a given fiscal year, the dividend cannot exceed the distributable surplus, equal to 75% of net income. This calculation is based on the consolidated financial statements. However, no dividend may be declared in respect of a financial period if the payment thereof would have the effect of reducing the company's capitalization rate to less than 25% at the end of that period.

## EARNINGS VARIANCES

Every year, Hydro-Québec files a rate application with the Régie de l'énergie based on the expected amounts needed to supply electricity during the following year. Since the year covered by the application only ends 20 months later, economic fluctuations may bring about a variance between the actual and authorized returns. In the last few years, earnings variances have averaged 1%, which means the company's forecasts have proven 99% accurate.

Until now, when they were in the company's favor, earnings variances were used to increase the dividend paid to the shareholder. As of 2019, however, they will be shared with customers in the form of downward pressure on rate adjustments.





# Sales outside Québec

Our volume of available electricity opens the door to sales and business opportunities in neighboring markets, particularly through long-term agreements. Since the 1980s, we've been selling power to New England—a region that accounts for roughly half of Hydro-Québec's electricity exports. These transactions are beneficial from both an environmental and an economic standpoint. We are making every effort to promote our hydropower in neighboring markets.

Residential customers in Québec paid 7.13¢/kWh for electricity in 2018, a rate that includes generation, transmission and distribution costs. By comparison, in Boston the residential rate was 31.52¢/kWh and in New York City, 30.46¢/kWh. (+)

## TOWARD CLEANER AIR IN THE U.S. NORTHEAST: THE APPALACHES-MAINE INTERCONNECTION

Massachusetts has chosen Hydro-Québec to provide clean, renewable energy to help meet its high level of electricity demand. Exporting 9.45 TWh of energy each year for 20 years (2022–2042) will call for a new interconnection between Québec and the United States.

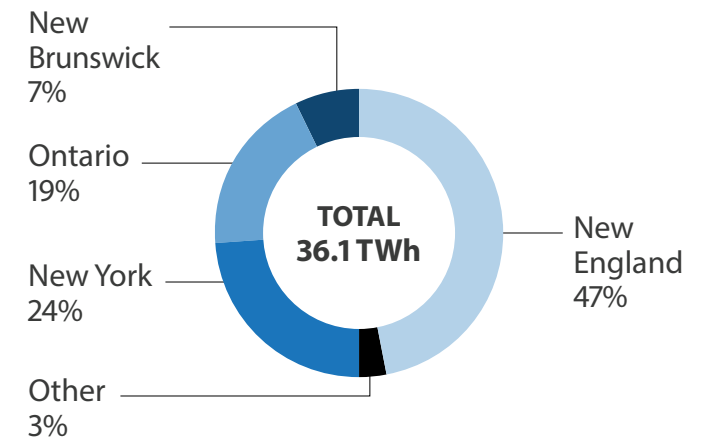
In Québec, the project involves building a 320-kV direct-current line extending approximately 100 km between Appalaches substation and a connection point on the Québec/Maine border. Work is scheduled to take place between spring 2021 and fall 2022.

In the U.S., project partner Central Maine Power will build a 230-km transmission line—the New England Clean Energy Connect (NECEC)—between the connection point and the city of Lewiston, Maine.

The Massachusetts Department of Energy Resources estimates that annual emissions avoided throughout the term of the contract total over 36 Mt of CO<sub>2</sub> eq.

[Project history](#) (+)

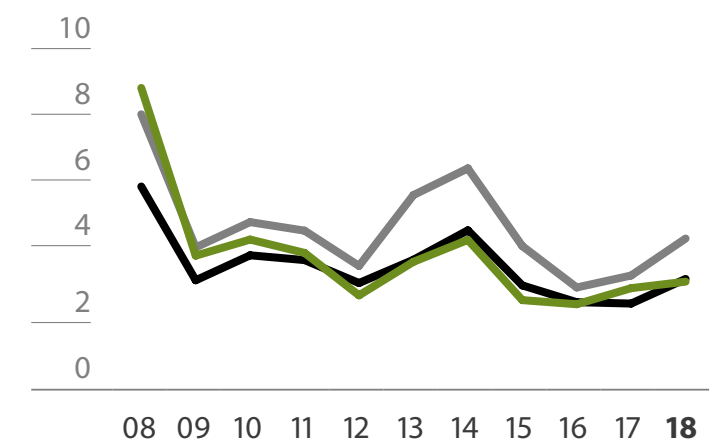
## NET ELECTRICITY SALES OUTSIDE QUÉBEC – 2018



(+) SALES FOR 2015–2018

## TRENDS IN ENERGY PRICES ON HYDRO-QUÉBEC'S EXTERNAL MARKETS

Average price index



- Natural gas: Henry Hub (US\$/MMBtu)
- Electricity: New England – ISO-NE, Mass Hub, Day-Ahead Market (US¢/kWh)
- Electricity: New York – NYISO, Zone A, Day-Ahead Market (US¢/kWh)



# New market development

In light of changes in the energy industry and with a view to increasing its revenues and income, Hydro-Québec is exploring new growth avenues in Québec and abroad.

## DEVELOPING NEW MARKETS IN QUÉBEC

Our considerable energy surplus lets us offer clean, affordable electricity to energy-intensive industries, such as data centers, seeking to reduce their GHG emissions.

Hydro-Québec works with these industries at every stage in the process. We help them find sites that meet their requirements and offer them programs tailored to their needs. The year 2018 was marked by sustained growth in the targeted markets.



## 2018 HIGHLIGHTS

- Electricity demand from data centers was 34% higher than in 2017: 560.8 GWh (416.9 GWh in 2017). Most of these centers are located in the greater Montréal area.
- Greenhouse growers used 18% more electricity than in 2017: 164.4 GWh (139.4 GWh in 2017).
- We continued our aggressive campaign to recruit data centers to Québec by offering investors competitively priced clean energy, a [business-friendly environment](#) and other incentives.
- We took part in a [number of events](#) about data centers, the better to promote [our offer and the advantages](#) to setting up shop in Québec.
- We submitted a proposal to the Régie de l'énergie concerning a selection process to reserve a 300-MW block for the use of cryptography as applied to blockchains.

## ACQUISITION OF ASSETS AND STAKES OUTSIDE QUÉBEC

Hydro-Québec has developed outstanding expertise and technological solutions, particularly in hydroelectric generation and power transmission. In addition to electricity exports and commercializing technological innovations, our growth strategy centers on acquiring assets and stakes in companies involved in hydroelectric generation and high-voltage transmission, whose operations and performance stand to benefit from our know-how. Currently, our search for these acquisitions is concentrated in Latin America and Europe. Each potential opportunity is subject to a diligent review process that includes rigorous risk assessment in different areas and complies with eight investment principles.

RISK ASSESSMENT


INVESTMENT PRINCIPLES



# Technological innovation

As a high-tech company, Hydro-Québec has banked on innovation from the start. Our areas of expertise are energy efficiency, ground transportation electrification, battery technology, equipment inspection, maintenance, performance and long-term operability, natural water inflow forecasting and hydropower generation. With over 1,000 patents and thousands of published scientific papers to its credit, our research institute, IREQ, is renowned nationally and internationally for its scientific breakthroughs, inventions and R&D.

## TECHNOLOGICAL VISION 2035

The energy transition is in full swing. To mark the shift, we've developed a corporate vision for technological progress by 2035, built around three main pillars: our customers, our assets and tomorrow's power system.  Each of these key objectives has been set specific targets, not just for 2035, but also in the short (0–3 years), medium (3–7 years) and long term (7–15 years). Our technological vision is reviewed annually to keep our actions relevant.

Hydro-Québec's engagement in the power industry transformation includes taking into account the digital and transactional aspects

of the shift. We aim to take full advantage of emerging technologies, align our R&D with business unit needs and seize business opportunities as they arise. Our thinking encompasses a number of topics, including transportation electrification and alternative fuels like hydrogen.



## 2018 HIGHLIGHTS

► We held two series of workshops aimed at putting our Technological Vision 2035 into effect. These were attended by some 170 employees who shared their knowledge of technology, the energy industry and our core businesses. Together, we developed technology roadmaps that will determine our technological choices in the years to come and set out ways to achieve them.

## HYDROGEN POTENTIAL IN QUÉBEC

We are currently evaluating various options to help decarbonize Québec's economy. These include replacing fossil fuels with clean energy and using electricity to produce carbon-neutral alternatives like hydrogen.

A multidisciplinary team assessed the strategic, technological and financial relevance of hydrogen—particularly clean hydrogen produced without fossil fuels—to determine our position on this form of energy. It studied hydrogen-based technologies and uses around the world and identified emerging markets. The research will continue in 2019, but it seems likely that clean hydrogen will contribute to deep decarbonization in Québec, at least in the medium-term.



## BUILDING SUSTAINABILITY INTO EVERYDAY LIFE

*To keep pace with the global energy transition, our technology research must take into account multiple aspects. For this reason, in spring 2018 we invited 170 employees from every area to help flesh out our Technological Vision 2035. Sharing their knowledge of energy technologies and our operations, they developed a roadmap with concrete deliverables that, with the support of all business units, will enable us to achieve our vision. The entire company is on board, right up to senior management.*

**Alain Forcione, Manager – Technological Vision and Scenarios, IREQ**

FULL TESTIMONIAL



Unique in North America, Hydro-Québec's Varennes-based research institute, IREQ, supports our long-term development.

### R&D

Once again in 2018, Hydro-Québec was the top Canadian R&D spender in the electricity industry, according to ReSearch Infosource. With a budget of \$116 million, ✓ our research institute IREQ develops state-of-the-art technologies in numerous fields related to power systems and renewable energy. Our new [Center of Excellence in Transportation Electrification and Energy Storage](#), which has a budget of \$32 million, ✓ is focused on advanced lithium-ion and solid-state batteries. In 2018, income from our patents and commercialized innovations totaled \$12 million. ✓

## INFLOW FORECASTING – THE HSAMI+ MODEL

Hydro-Québec operates hydroelectric generating stations in 93 watersheds, in 13 water-resource systems and downstream of 28 large reservoirs. HSAMI, a tool developed in 1983, helps us plan our power generation.

The HSAMI hydrological model forecasts natural inflow based on multiple parameters: weather forecasts, precipitation data (rain and snow) and soil conditions (moisture, water table levels). The model predicts daily inflows for the next 10 and 200 days. These forecasts are vital to optimizing water management, whether for electricity generation, equipment maintenance or the safety and security of facilities, public property and the general public.

HSAMI+, the 2018 version of the hydrological model, offers even greater precision in computing watershed specificities. This will help us better anticipate hydrometeorological events in the face of climate change.





**2018 HIGHLIGHTS**

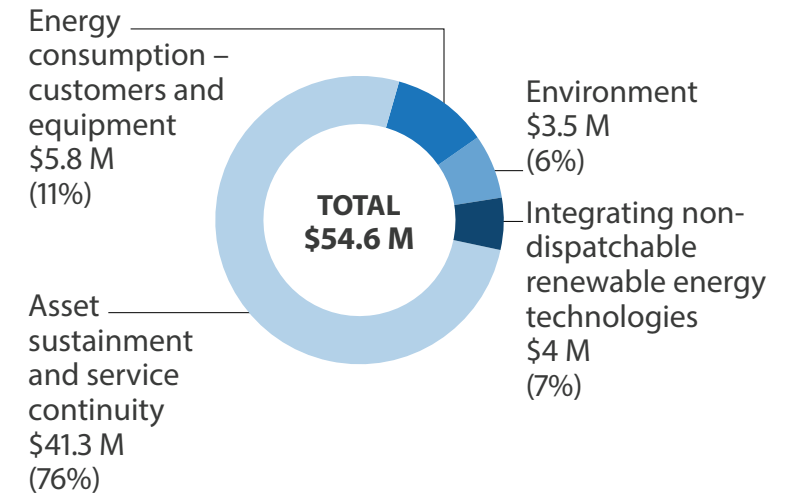
- ▶ We opened our new [Center of Excellence in Transportation Electrification and Energy Storage \(CETEES\)](#), whose mission is to maintain and enhance Québec’s global leadership in the field of battery materials. Since 2011, R&D in this area has generated \$108 million in revenues.
- ▶ We integrated distance control for automated devices through cellular links into our overhead distribution system by replacing existing analog telephone lines. The anticipated return on investment (\$10 million) should be achieved in two years. The overhead system currently has some 4,400 automated devices. The technology will be gradually incorporated into the underground system.
- ▶ We unveiled our [LineRanger](#), a robotics prototype developed by IREQ for inspecting conductor bundles on high-voltage power lines. The LineRanger will inspect some 20 km of live transmission lines daily.
- ▶ IREQ is the lead proponent in a next-gen smart grid initiative from Natural Resources Canada. The project will foster the rapid integration of renewables into the grid.



^^ LineRanger, revolutionizing transmission line inspection through advanced robotics.

^ Lithium-ion batteries are manufactured at the Center of Excellence in Transportation Electrification and Energy Storage (CETEES).

**BREAKDOWN OF IREQ INNOVATION EFFORTS RELATED TO SUSTAINABILITY<sup>a</sup> – 2018 ✓**



a) Excludes investments in energy storage and conversion.

In keeping with our Technological Vision 2035, we’ve begun restructuring our organization and research projects. Today, our efforts focus above all on the long-term operability of our facilities and equipment.



**EXCLUSIVE WEB CONTENT**

- [Technological innovation](#)
- [List of our patents](#)



## EXAMPLES OF SUSTAINABILITY-RELATED INNOVATION PROJECTS – 2018

### CLIMATOLOGY

**Purpose:** Define the impact of climate change; apply this information to innovation projects; anticipate needs in terms of adapting to climate change; conduct studies on implementing the climate change adaptation response.

**Needs:** The fact that nearly all of our output is generated from water makes us vulnerable to climate change, which has a greater effect in northern regions. Since March 2018, any project requiring an impact study must also include an analysis of the anticipated climate change risks and impacts vis-à-vis the project and its host environment.

**Objectives:** Improve knowledge of climate change to minimize its negative impacts on certain Hydro-Québec operations and maximize the benefits from any positive impacts on other operations.

**Results:**

- › Our partnership agreement with the Ouranos consortium regarding climate change adaptation was extended to 2024.
- › We launched a project to reappraise the value of hydroelectric assets in a climate change context.
- › We established a coordinating committee to mobilize our employees around the question of climate change adaptation.
- › We organized a symposium on Hydro-Québec's climate change adaptation response.
- › We've integrated climate change into long-range natural inflow forecasting and have factored this information into our projected energy exports to Massachusetts.

**Investment in 2018:** \$1.5 million ✓

### INTEGRATING RENEWABLES INTO OFF-GRID SYSTEMS

**Purpose:** Provide tools and information for integrating renewables into off-grid systems (OGS) with a view to lowering operating costs and GHG emissions. Developments to date include the OPERA simulator, used for OGS planning and operations, and the ExploRA, which optimizes OGS operations. OPERA simulates OGS operations by taking into account all of the relevant physical parameters (system load, wind speed, solar radiation, temperature, etc.). It also estimates long-term diesel savings based on the operating rules applicable to diesel-fired power plants, type of renewable energy and energy storage system capacity.

Using the simulator as a computational kernel and drawing on the economic dataset, ExploRA assesses multiple renewable integration scenarios, ultimately presenting an optimized solution and the most economically viable scenarios.

**Needs:** Accelerate the energy transition in off-grid systems.

**Objectives:** Develop new tools and information to help renewables penetrate the OGS sector and recover investments.

**Results:** An improved version of OPERA will be implemented and used by OGS planners.

**Timeline:** Once finalized in 2020, the tools will allow planners to determine the best generation technology combination for each OGS.

**Investment in 2018:** \$1 million ✓



## SUPPORT FOR RESEARCH AND UNIVERSITY CHAIRS

We supported two new research chairs:

- › Chair in Energy Sector Management (HEC Montréal)  
– \$25,000 contribution ✓
- › Characterization and synthesis of new high-energy density materials for batteries (McGill University)  
– \$150,000 contribution ✓

We partnered with the Natural Sciences and Engineering Research Council of Canada (NSERC) to support three new collaborative research and development projects:

- › Transactional management of residential demand (energy and capacity) (Université du Québec à Trois-Rivières)  
– \$125,000 contribution ✓
- › Developing procedures to improve power transformer diagnostics and performance (Université du Québec à Chicoutimi)  
– \$60,000 contribution ✓
- › Improving performance of high-voltage insulators in atmospheric icing conditions (Université du Québec à Chicoutimi)  
– \$56,750 contribution ✓

[Contributions, commitments, research chair funding and research contracts](#) (+)

## DEVELOPING PARTNERSHIPS

We support Québec universities by establishing partnerships with them, awarding them research contracts and funding [university research chairs](#). We also partner with various organizations to develop and commercialize innovations.

### 2018 HIGHLIGHTS

- › We signed an R&D cooperation agreement with Nouveau Monde Graphite (NMG) to optimize that company's graphite for use in lithium-ion batteries, and a licence granting NMG the right to use our patented graphite-processing technologies. The association should help bring to market the battery material technologies we've been developing for over 30 years.
- › We partnered with CGI for the mass commercialization of MILES, an innovative solution that uses advanced data analytics to detect, locate and diagnose distribution system faults. Developed by IREQ, MILES provides clear and timely information on system failures that result in power outages and customer complaints.



Dana axle with a TM4 SUMO electric powertrain (motor and inverter).

### HYDRO-QUÉBEC, DANA AND TM4

In 2018, we forged a strategic partnership with multinational automotive supplier Dana Incorporated. Under the agreement, Dana gains a controlling (55%) interest in our subsidiary TM4, which develops, manufactures and markets hybrid and electric motor systems. The partnership strengthens TM4's position as an international center of excellence.

The Boucherville-based TM4 is now Dana's supplier of electric motors, power inverters and controllers. Hydro-Québec maintains a 45% interest along with veto rights with regard to governance and strategic decisions.

Thanks to Dana's international reach and North American sales network, TM4 will be able to expand its operations, access markets quickly and become a global industry leader without sacrificing its brand integrity. Hydro-Québec has succeeded in its aim to secure TM4's growth for the coming years while generating economic benefits for Québec. The gain on this transaction amounted to \$277 million.



# Communication on progress

Hydro-Québec first joined the United Nations Global Compact in 2004, and remained a member until it had sold all of its international interests and based its operations exclusively in Québec.


In 2018, we renewed our engagement, pledging to communicate our progress with regard to the compact's Ten Principles, which are grouped around four areas:



## Human rights




## Labor

 [Go to \*Enhancing corporate governance and remaining an employer of choice\*](#)




## Environment

 [Go to \*Preserving the environment and adapting to climate change\*](#)



## Anti-corruption

 [Go to \*Enhancing corporate governance and remaining an employer of choice\*](#)

In this regard, we are making every effort to:

- › Better integrate sustainability principles into our corporate management system
- › Improve our sustainability performance
- › Continue the dialogue with our stakeholders
- › Improve the overall impact of our activities with respect to sustainable development

We also support the 17 Sustainable Development Goals of the United Nations Development Programme. These goals build on the successes of the Millennium Development Goals while including new areas such as climate change and energy efficiency.

We intend to do our part by pursuing the objectives most relevant to our industry and projects. Accordingly, we've selected four goals associated with nine targets. Our contribution to these are presented in the first pages of the seven sections that make up this report. Each section focuses on one of our main sustainability challenges.



# Sustainable development action plan 2015–2020

In July 2015, in response to the [Québec government’s sustainable development strategy 2015–2020](#) (in French only), we published our third [Sustainable Development Action Plan](#). Through our initiatives, we aim to contribute to implementing this strategy, the [strategy to ensure the occupancy and vitality of territories](#) (in French only) and Québec’s [Agenda 21 for culture](#) (in French only).

ACTION	INDICATOR	TARGETS AND RESULTS									
		2015	2016	2017	2018	2019	2020				
<b>OVT</b> <b>1   BUILD HYDROPOWER PROJECTS</b> 	Cumulative capacity made available by the Romaine project (MW)										
		<b>OVT</b> <b>2   INCREASE THE CAPACITY OF EXISTING HYDROELECTRIC GENERATING STATIONS</b> 	Cumulative gains in additional available peak capacity (MW)								
				<b>3   CONTINUE ENERGY EFFICIENCY INITIATIVES</b> 	New annual energy savings (GWh)						
						<b>OVT</b> <b>4   CONTINUE EFFORTS IN THE FIELD OF TRANSPORTATION ELECTRIFICATION IN QUÉBEC</b> 	Number of Electric Circuit charging stations in service/ number of regions served				
R&D partnership agreements	<b>2 agreements.</b> No target has been set for this indicator ✓										
	Number of patents held	<b>533 patents.</b> No target has been set for this indicator ✓									

**OVT** Action related to the implementation of the strategy to ensure the occupancy and vitality of territories.



## Sustainable development action plan 2015–2020

ACTION	INDICATOR	TARGETS AND RESULTS					
		2015	2016	2017	2018	2019	2020
<p><b>C</b> 5   PUBLICIZE THE KNOWLEDGE ACQUIRED THROUGH HYDRO-QUÉBEC ENVIRONMENTAL STUDIES</p> <p>(+)</p>	Number of publications on the Web	3 2	3 2	7 2	4 ✓ 2	2	2
<p><b>OVT</b> 6   CONTINUE TO PROTECT AND ENHANCE THE COMPANY'S BUILT, TECHNOLOGICAL AND INTANGIBLE HERITAGE</p> <p>(+)</p>	Number of measures carried out by 2020	1	2	3	7 ✓		2
<p><b>OVT</b> 7   STRENGTHEN ENVIRONMENTALLY RESPONSIBLE MANAGEMENT PRACTICES</p> <p>(+)</p>	Annual GHG emissions from the light-vehicle fleet (t CO <sub>2</sub> eq.)	25,360 25,322	25,360 22,852	24,733 21,532	24,590 21,215 ✓	24,446	24,302
	Number of videoconferences held annually	6,723 4,360	9,266 4,430	12,247 4,500	17,074 ✓ 4,580	4,650	4,720
	Company printers that are print-release enabled (%)	7.6	11.4	16.0	18.4 ✓		15

**OVT** Action related to the implementation of the strategy to ensure the occupancy and vitality of territories.

**C** Action related to the implementation of Québec's Agenda 21 for culture.



## Sustainable development action plan 2015–2020

ACTION	INDICATOR	TARGETS AND RESULTS					
		2015	2016	2017	2018	2019	2020
<b>OVT</b> 8   CONTINUE MEASURES THAT TAKE INTO ACCOUNT AND PROTECT BIODIVERSITY AND ECOSYSTEM SERVICES 	Number of innovative measures implemented annually to take into account and protect biodiversity and ecosystem services	7 5	7 5	5 5	5 ✓ 5	5	5
9   OPTIMIZE THE APPLICATION OF SUSTAINABILITY PRINCIPLES TO PROJECTS AND ACTIVITIES 	Number of projects or activities analyzed each year	1 1	1 1	1 1	1 ✓ 1	1	1
<b>OVT</b> 10   PROMOTE THE INTEGRATION AND FAVORABLE RECEPTION OF HYDRO-QUÉBEC'S SYSTEM EQUIPMENT 	Regional county municipalities (RCMs) that have received the information (%)		2	18	44 ✓		90
11   INTEGRATE THE NOTION OF LIFE CYCLE IN OUR INNOVATION EFFORTS 	Number of projects to which sustainability and eco-innovation principles have been applied	1 1	1 1	1 1	1 ✓ 1	1	1
12   KEEP UPDATING THE STATE OF KNOWLEDGE ON THE LIFE CYCLE ASSESSMENT OF THE ELECTRICITY DISTRIBUTED IN QUÉBEC 	Number of updates of inventory data on the life cycle of Québec's electricity mix per year	1 1	1 1	1 1	1 ✓ 1	1	1

**OVT** Action related to the implementation of the strategy to ensure the occupancy and vitality of territories.



# GRI content index for 'In Accordance' Core<sup>a</sup>



With regard to the Materiality Disclosures Service, the GRI has established that the presentation of the GRI content index is clear and that the references shown for disclosures 102-40 to 102-49 refer to the corresponding sections in the body of this report.

a) More information is provided in the Global Reporting Initiative (GRI) index on the Hydro-Québec [Web site](#).

b) When a general standard disclosure is dealt with only on the Web site, the word Web is listed.

## GENERAL DISCLOSURES

NO.	GENERAL DISCLOSURES	PAGE <sup>b</sup>	OMISSION
<b>GRI 101: General Disclosures 2016</b>			
	GRI 101 does not require any particular disclosure		
<b>GRI 102: General Disclosures 2016</b>			
<b>ORGANIZATIONAL PROFILE</b>			
GRI 102-1	Name of the organization	1, 5	
GRI 102-2	Activities, brands, products and services	5, 12, 13	
GRI 102-3	Location of headquarters	<a href="#">Web</a>	
GRI 102-4	Location of operations	5, 13	
GRI 102-5	Ownership and legal form	<a href="#">Web</a>	
GRI 102-6	Markets served	5, 13	
GRI 102-7	Scale of the organization	5, 13-15, 34, 57	
GRI 102-8	Information on employees and other workers	5, 13	Workforce numbers based on contract type are not available. Total numbers of outside workers by employment type, employment contract and region are not available.
GRI 102-9	Supply chain	9, 26, 34, 35	
GRI 102-10	Significant changes to the organization and its supply chain	<a href="#">Web</a>	
GRI 102-11	Precautionary Principle or approach	23, 24, 33, 49, 50, 51, 52	
GRI 102-12	External initiatives	10, 18, 21, 22, 51	
GRI 102-13	Membership of associations	18, 25, 42, 49, 50, 56, 57, 60	
<b>STRATEGY AND ANALYSIS</b>			
GRI 102-14	Statement from senior decision-maker	7, 8	
GRI 102-15	Key impacts, risks and opportunities	4, 12, 14, 15	
<b>ETHICS AND INTEGRITY</b>			
GRI 102-16	Values, principles, standards, and norms of behavior	18, 20	
<b>GOVERNANCE</b>			
GRI 102-18	Governance structure	18-22	





## GRI content index for 'In Accordance' Core<sup>a</sup>

### GENERAL DISCLOSURES

NO.	GENERAL DISCLOSURES	PAGE <sup>b</sup>	OMISSION
GRI 102-22	Composition of the highest governance body and its committees	18-20	
GRI 102-23	Chair of the highest governance body	20	
GRI 102-24	Nominating and selecting the highest governance body	19, 20	
GRI 102-32	Highest governance body's role in sustainability reporting	20	

### STAKEHOLDER ENGAGEMENT

GRI 102-40	List of stakeholder groups	9, 17, 26, 37, 45, 55, 62, 75	
GRI 102-41	Collective bargaining agreements	84	The percentage of outside workers covered by a collective agreement is not available (sector supplement).
GRI 102-42	Identifying and selecting stakeholders	9, 11, 17, 26, 37, 45, 55, 62, 75	
GRI 102-43	Approach to stakeholder engagement	9, 11	
GRI 102-44	Key topics and concerns raised	11, 17, 26, 37, 45, 55, 62, 75	

### REPORTING PRACTICE

GRI 102-45	Entities included in the consolidated financial statements	10, 12	
GRI 102-46	Defining report content and topic boundaries	11	
GRI 102-47	List of material topics	11, 17, 26, 37, 45, 55, 62, 75	
GRI 102-48	Restatements of information	62	Sale of renewable energy certificates
GRI 102-49	Changes in reporting	10, 11	
GRI 102-50	Reporting period	10	
GRI 102-51	Date of most recent report	<a href="#">Web</a>	
GRI 102-52	Reporting cycle	10	

a) More information is provided in the Global Reporting Initiative (GRI) index on the Hydro-Québec [Web site](#).

b) When a general standard disclosure is dealt with only on the Web site, the word Web is listed.



## GRI content index for 'In Accordance' Core<sup>a</sup>

### GENERAL DISCLOSURES

NO.	GENERAL DISCLOSURES	PAGE <sup>b</sup>	OMISSION
GRI 102-53	Contact point for questions regarding the report	95	
GRI 102-54	Claims of reporting in accordance with the GRI Standards	10	
GRI 102-55	GRI content index	88-92	
GRI 102-56	External assurance	93-94	

### ELECTRIC UTILITIES SECTOR DISCLOSURES

EU1	Installed capacity	5, 12, 13	
EU2	Net energy output	14, 62	
EU3	Number of customer accounts	12, 13, 39	
EU4	Length of transmission and distribution lines	5, 12, 13	
EU5	Allocation of CO <sub>2</sub> emissions allowances or equivalent	46, 47	

### MANAGEMENT APPROACH

#### GRI 103: Management Approach 2016

+	GRI 103-1	Explanation of the material topic and its Boundary	11, 12, 13, 17, 26, 37, 45, 55, 62, 75	
+	GRI 103-2	The management approach and its components	7, 8, 12, 14, 15, 17, 26, 37, 45, 55, 62, 75	
+	GRI 103-3	Evaluation of the management approach	13, 14, 15	

### ECONOMIC

#### GRI 201: Economic Performance 2016

GRI 201-1	Direct economic value generated and distributed	12, 13, 26, 34, 36, 83	Salaries and employee benefits are considered confidential information and are not released.
GRI 201-2	Financial implications and other risks and opportunities due to climate change	45-49	

#### GRI 203: Indirect Economic Impacts

GRI 203-1	Infrastructure investments and services supported	30, 31, 58	
-----------	---	------------	--

a) More information is provided in the Global Reporting Initiative (GRI) index on the Hydro-Québec [Web site](#).

b) When a general standard disclosure is dealt with only on the Web site, the word Web is listed.



## GRI content index for 'In Accordance' Core<sup>a</sup>

### GENERAL DISCLOSURES

NO.	GENERAL DISCLOSURES	PAGE <sup>b</sup>	OMISSION
GRI 203-2	Significant indirect economic impacts	12, 15, 34, 70-72	
<b>GRI 204: Procurement Practices 2016</b>			
GRI 204-1	Proportion of spending on local suppliers	13, 34, 72	
<b>Aspect: Availability and Reliability (Electric Utilities Sector Disclosures)</b>			
EU10	Planned capacity against projected electricity demand over the long term	63-66	
<b>ENVIRONMENT</b>			
<b>GRI 301: Materials 2016</b>			
GRI 301-1	Materials used by weight or volume	<a href="#">Web</a>	Hydro-Québec does not measure the weight or volume of recycled materials used.
GRI 301-2	Recycled input materials used	<a href="#">Web</a>	
<b>GRI 302: Energy 2016</b>			
GRI 302-4	Reduction of energy consumption	14, 67-69, 85	
<b>GRI 303: Water 2016</b>			
GRI 303-1	Interactions with water as a shared resource	14	
<b>GRI 304: Biodiversity 2016</b>			
GRI 304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and area of high biodiversity value outside protected areas	50, 54	
<b>GRI 305: Emissions 2016</b>			
GRI 305-1	Direct (Scope 1) GHG emissions	14, 45, 47, 48, 86	
GRI 305-2	Energy indirect (Scope 2) GHG emissions	45, 48	
GRI 305-3	Other indirect (Scope 3) GHG emissions	45, 48	
GRI 305-4	GHG emissions intensity	45, 48	
GRI 305-5	Reduction of GHG emissions	14, 45, 48	

a) More information is provided in the Global Reporting Initiative (GRI) index on the Hydro-Québec [Web site](#).

b) When a general standard disclosure is dealt with only on the Web site, the word Web is listed.



## GRI content index for 'In Accordance' Core<sup>a</sup>

### GENERAL DISCLOSURES

NO.	GENERAL DISCLOSURES	PAGE <sup>b</sup>	OMISSION
GRI 305-7	Nitrogen oxides (NO <sub>x</sub> ), sulfur oxides (SO <sub>x</sub> ), and other significant air emissions	14, 47	
<b>GRI 306: Effluents and Waste 2016</b>			
GRI 306-3	Significant spills	14, 51	
<b>GRI 307: Environmental Compliance 2016</b>			
GRI 307-1	Noncompliance with environmental laws and regulations	14, 71, 72	
<b>SOCIAL – LABOR PRACTICES AND DECENT WORK</b>			
<b>GRI 403: Occupational Health and Safety 2016</b>			
GRI 403-2	Hazard identification, risk assessment, and incident investigation	15, 23, 33	Hydro-Québec discloses only the work-related accident rate. Other information for this indicator is confidential.
<b>GRI 405: Diversity and Equal Opportunity 2016</b>			
GRI 405-1	Diversity of governance bodies and employees	24, 25	
<b>SOCIAL – SOCIETY</b>			
<b>GRI 413: Local Communities 2016</b>			
GRI 413-1	Operations with local community engagement, impact assessments, and development programs	27, 29, 32, 59	The percentage is not available.
GRI 413-2	Operations with significant actual and potential negative impacts on local communities	13, 70, 71, 72, 74	
<b>SOCIAL – PRODUCT RESPONSIBILITY</b>			
<b>Aspect: Customer Health and Safety</b>			
EU25	Number of injuries and fatalities to the public involving company assets	33	Information about court decisions, out-of-court settlements and ongoing suits related to disease cases is not available.
<b>GRI 417: Marketing and Labeling 2016</b>			
GRI 417-1	Requirements for product and service information and labeling	47, 48	
<b>Aspect: Access (Electric Utilities Sector Disclosures)</b>			
EU29	Average power outage duration	15, 37	

a) More information is provided in the Global Reporting Initiative (GRI) index on the Hydro-Québec [Web site](#).

b) When a general standard disclosure is dealt with only on the Web site, the word Web is listed.



# Independent assurance

## To Hydro-Québec Management

EEM Gestion ESS inc. was engaged to conduct an independent evaluation of Hydro-Québec's *Sustainability Report 2018*, which covers the period from January 1 to December 31, 2018. Our role consists in providing an independent opinion of this Report, the publication of which is the responsibility of Hydro-Québec.

## ASSURANCE MISSION

Our evaluation was conducted in compliance with the requirements of Type 2 assurance as provided in the *AccountAbility AA1000 Assurance Standard (2008)* for a moderate level of assurance. The following qualities of the Report were reviewed:

- › Adherence to the Principles for Sustainable Development in the *AA1000 AccountAbility Principles Standard (2018)*
- › Reliability of the quantitative sustainability performance information (identified in the Report by the ✓ symbol)
- › Concordance of Hydro-Québec's performance information with specific indicators drawn from the Global Reporting Initiative (GRI) standard disclosures

## STATEMENT OF INDEPENDENCE

EEM Gestion ESS has policies and procedures in place to ensure that its employees maintain their independence during the execution of its independent evaluations. The evaluation of this Report was carried out by a team of seasoned auditors holding recognized professional certification. The team members confirm that they are independent.

## ASSURANCE APPROACH

The evaluation conducted by EEM Gestion ESS between January and March 2019 consisted of the following:

- › Interviews with Hydro-Québec managers and executives on current issues and subjects of interest for stakeholders in relation to sustainability. This exercise allowed us to further our understanding of how these issues are considered and presented by Hydro-Québec in its Report, and to validate the degree of Hydro-Québec's adherence to the AA1000 AP (2018) sustainability principles.
- › Verification of over 550 data items, including interviews with some 50 employees to better understand the data collection process, the sources of the data and control measures applied.
- › Verifications to validate the concordance of data with specific indicators drawn from the Global Reporting Initiative (GRI) standard disclosures.



## Independent assurance

### ADHERENCE TO THE AA1000 PRINCIPLES

**Inclusivity:** Hydro-Québec identifies its stakeholders systematically; they include members of industry and civil society. Hydro-Québec's regular dialogue with its stakeholders demonstrates the organization's commitment to social acceptability in its business strategy, which is further materialized by the integration of sustainability principles in its projects and operations.

**Materiality:** Hydro-Québec has a robust and interactive Materiality Analysis process that covers the entire organization. The process is used to review and prioritize issues, and contributes to the content of the Report. The previous Materiality Analysis, conducted in 2017, as well as a responsiveness exercise conducted with stakeholders in 2018, served as a basis for the *Sustainability Report 2018*.

**Responsiveness:** To respond to the concerns of external and internal stakeholders, Hydro-Québec has acquired and strategically deployed various tools and resources. The organization prioritizes responsiveness based on its relevant issues and its sustainability challenges. The stakeholders appear to be well served by these processes, including the annual publication of the Sustainability Report.

**Impact:** Hydro-Québec has a history of systematically evaluating the impacts of its strategies, decisions, projects and activities on the environment and on its stakeholders. These evaluations fuel the organization's dialogue and interactions with the stakeholders. The impacts are documented in the Report and as they relate to the materiality matrix.

### CONCLUSION

The assurance team considers that, based on the assurance approach used, the information contained in the *Sustainability Report 2018* presents a reliable account of Hydro-Quebec's sustainability performance during the period.

Montréal, March 21, 2019

**Véronique Tousignant**

Lead Auditor

Director of Administration and Partner, EEM Gestion ESS

AA1000 Licensed Assurance Provider 270



**SHARE YOUR COMMENTS WITH US**

We would like to know what you think of our report. Please [submit](#) your questions and comments.

**UNITS OF MEASURE**

**¢/kWh** cent or \$0.01 per kilowatthour  
**\$'000** thousands of dollars  
**\$M** millions of dollars  
**\$G** billions of dollars  
**V** volt (a unit for measuring voltage)  
**kV** kilovolt (one thousand volts)  
**W** watt (a unit for measuring power)  
**kW** kilowatt (one thousand watts)

**MW** megawatt (one million watts)  
**GW** gigawatt (one billion watts)  
**Wh** watthour (a unit for measuring electric energy)  
**kWh** kilowatthour (one thousand watthours)  
**MWh** megawatthour (one million watthours)  
**GWh** gigawatthour (one billion watthours)  
**TWh** terawatthour (one trillion watthours)

**MMBtu** one million Btu (British thermal units)  
**t** tonne (metric ton)  
**t CO<sub>2</sub> eq.** tonne of CO<sub>2</sub> equivalent  
**kt CO<sub>2</sub> eq.** thousands of tonnes of CO<sub>2</sub> equivalent  
**Mt CO<sub>2</sub> eq.** millions of tonnes of CO<sub>2</sub> equivalent  
**Mtoe** million toe (a million tonnes of oil equivalent)

© Hydro-Québec  
 Affaires corporatives et  
 juridiques et gouvernance

Reproduction authorized  
 with reference to source

Legal deposit – 2nd quarter 2019  
 Bibliothèque et Archives nationales  
 du Québec  
 ISBN 978-2-550-83546-2 (PDF)

2019G161A

The original text written  
 in French shall prevail.

*Ce document est également  
 publié en français.*

