

# The power of hydrogen

Innovative solutions to help achieve our climate goals

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How hydrogen supports a clean energy future

What makes hydrogen a clean energy alternative?

How Enbridge Gas is bringing hydrogen into action to support Ontario's energy transition

Where can hydrogen have the biggest impact?



# For a clean energy economy

**HYDROGEN STORAGE TANK**

As the world transitions towards a clean energy future, the urgency of achieving net-zero emissions has never been greater. Clean hydrogen can allow energy to be effectively and efficiently stored, transported, and used in innovative ways to reduce greenhouse gas (GHG) emissions—and help the world reach its climate target goals by 2050. By working closely with key decision-makers, Enbridge Gas can put hydrogen into action to help achieve climate commitments in areas such as municipal, agricultural, industrial, transportation and more.

## How hydrogen supports a clean energy future

### Blending into the natural gas system

Hydrogen can be safely blended into Ontario's natural gas supply to offset the carbon footprint of the natural gas being delivered to Enbridge Gas customers.

### Long-term storage

Electricity can be converted into hydrogen and, like natural gas, stored year-round on a large (TWh) scale. It can then be used in its pure form, combined with other processes, or converted back into electricity for future use.

### Connecting to the electricity grid

Through ancillary services like frequency regulation and by leveraging our natural gas system to store excess electricity, Enbridge Gas is creating resiliency by enabling both systems to work together to balance Ontario's electricity supply and demand.

### Transportation and industry

Clean hydrogen can replace carbon-based fuels used for heavy-duty transportation like rail and aviation, and industrial processes such as cement and steel manufacturing, outperforming them from an environmental and efficiency perspective.



Did you know?

### Hydrogen has the potential to<sup>1</sup>:

Deliver up to 30 percent of Canada's end use energy by 2050.

Create 350,000 hydrogen sector jobs across Canada.

Abate up to 190 Mt-CO<sub>2</sub>e of GHG emissions.

# What makes hydrogen a clean energy alternative?

## It comes down to how it's made

Power-to-Gas (PtG) is a process in which electrical energy is converted to hydrogen through the electrolysis of water. If only renewable sources of electricity are used, the hydrogen produced is called renewable. If hydrogen is produced from a mix of renewables and other sources, it's considered low-carbon.<sup>2</sup>

Most of today's hydrogen is created using steam methane reforming (SMR), a process that separates hydrogen from methane. If the carbon emissions are captured (greater than 90 percent) and safely stored, the hydrogen produced is considered low carbon, or blue.

Like electricity, hydrogen is a flexible energy carrier. Unlike electricity, it can be used to efficiently store electrical energy and turn it back into electricity when required.

## We're innovating to support Ontario's energy transition

As the global population grows, it's expected that energy usage will increase by 50 percent over the next 30 years<sup>1</sup>; getting to net zero has never been more important for the environment. Demand for clean hydrogen is expected to reach 500 – 800 million tonnes by 2050.<sup>1</sup> Enbridge Gas is supporting this transition to clean energy through innovative solutions and collaboration with governments and partners to help achieve our climate goals.

### North America's first utility-scale power-to-gas facility

Located in Markham, Ontario, our utility-scale PtG facility converts surplus energy from renewable sources into hydrogen, which can then be blended into the natural gas system to help balance Ontario's electricity supply and demand.

### Pilot blending project — the first of its kind in North America

Enbridge Gas is currently providing a blend of hydrogen and natural gas to 3,600 customers in Markham, Ontario as part of a pilot program to validate the reduction of carbon in our natural gas system.

### MiWay hydrogen fuel cell electric bus pilot

Enbridge Gas is working with Mississauga Transit, Canadian Urban Transit Research & Innovation Consortium (CUTRIC), Cummins, Ballard, New Flyer and all three levels of government to deploy 10 hydrogen fuel cell electric buses in the city of Mississauga to help MiWay begin the process of replacing its diesel fleet.



## Where can hydrogen have the greatest impact?



### Industry

- Cement
- Steel
- Chemicals – energy
- High-value chemicals
- Ammonia
- Methanol
- Other industries



### Transport

- Heavy-duty transport
- Shipping
- Aviation
- Rail
- Light-duty transport



### Buildings

- Heating

# Learn more about hydrogen's potential



## About Enbridge Gas

Enbridge Gas is Canada's largest natural gas storage, transmission and distribution company based in Ontario, with 2023 marking its 175th anniversary of serving customers. The distribution business provides safe, affordable, reliable energy to about 3.9 million customers and is leading the transition to a clean energy future through net-zero emissions targets and investments in innovative low-carbon energy solutions. The storage and transmission business offers a variety of storage and transportation services to customers at the Dawn Hub, the largest integrated underground storage facility in Canada and one of the largest in North America. Enbridge Gas is owned by Enbridge (ENB), a Canadian-based leader in energy transportation and distribution. Visit [enbridgegas.com](https://enbridgegas.com) to learn more.

## Contact us to explore opportunities with hydrogen

Enbridge Gas will work with you to provide viable solutions to help meet your climate commitments.



[hydrogen@enbridge.com](mailto:hydrogen@enbridge.com)



[enbridgegas.com/hydrogen](https://enbridgegas.com/hydrogen)



<sup>1</sup> Hydrogen Strategy for Canada. Seizing the Opportunities for Hydrogen: A Call to Action, 2020.

<sup>2</sup> Low carbon hydrogen is hydrogen produced from an electricity grid with an emission factor less than 36 (g CO<sub>2</sub>eq/kWh). In Ontario, hydrogen made from the electrical grid can be termed low carbon as it meets this threshold. In 2018 the Ontario electrical grid's annual average emission factor value (AEF) was 31 (g CO<sub>2</sub>eq/kWh).

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