Advancing Renewable Energy

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We never stop thinking about the future of energy and sustainability. That's why we're investing in renewable energy and transmission projects that complement our energy system, and meet the demand for safe, reliable and affordable energy well into the future.

Our portfolio

We've been building our renewable energy portfolio since 2002, and to date have invested more than \$6 billion in renewable energy and power transmission projects, currently in operation or under construction. Since 2015, Enbridge has committed \$2.1 billion in offshore wind investment projects under construction in Europe.

Today, we have a large North American wind and solar power footprint, with a growing offshore wind energy presence in Europe. We're also invested in power transmission and a wide range of alternative energy projects, including waste heat recovery and geothermal power generation that will make it economical to store renewable energy.

Enbridge's projects, either operating or under construction, have the capacity to generate more than 4,100 megawatts (MW) gross of zero-emission energy (nearly 2,000 MW net) and produce enough power to meet the energy needs of nearly 700,000 homes.

Why renewable energy at Enbridge?

As the largest energy infrastructure company in North America, our role is to deliver the energy to keep food on the table, people warm at night, power transportation and light up our cities.

This is a responsibility we take seriously and it drives our approach to sustainable development and the delivery of energy.

All forms of energy sources—oil, natural gas and renewables—are required to meet future energy needs as the world shifts to a low-carbon economy. This means leveraging all of our company's assets—whether it's pipelines, wind turbines or natural gas processing plants. At Enbridge, we're an important part of that transition.

The diversification of our energy systems is a priority for Enbridge—one that supports ongoing efforts to reduce greenhouse gas (GHG) emissions and the achievement of local, national and global climate goals, while enabling us to continue to deliver long-term value for our shareholders, customers, employees and the communities in which we operate.

Renewable Energy



Onshore Wind

Enbridge was an early investor in wind energy. We now have an interest in 16 onshore wind projects with the capacity to generate more than 2,400 MW gross of renewable wind energy in North America.

From our first wind farm investment in the 11-MW SunBridge Project in Western Canada, we are now one of the largest onshore wind companies in Canada with a presence in the United States

Today, we have 10 wind projects in Canada across Alberta, Saskatchewan, Ontario and Quebec. In the U.S., we own six wind projects: three are in Texas and the others in Colorado, West Virginia and Indiana.



Offshore Wind

Enbridge currently has significant investment in Europe with several offshore wind projects in operation, construction and development.

We have a 24.9 percent ownership in the Rampion Offshore Wind Project off the coast of Brighton, England, which entered service in 2018. This was our first offshore wind project and our first move into power generation outside North America.

Enbridge has a 25 percent ownership in the 609-MW Hohe See and Albatros Offshore Wind Projects in the North Sea off the coast of Germany.

Enbridge is a 50 percent owner of Éolien Maritime France (EMF) SAS, which has a 480-MW project in construction, Saint Nazaire, and is in the late stages of developing another 948 MW of offshore wind in France. Enbridge was also recently selected for another 600 MW offshore wind project in northern France.



Solar

We began harnessing the sun's rays in 2009, when our 80-MW Sarnia Solar Project one of the largest operating photovoltaic facilities in Canada—entered service in Ontario.

Three years later, we followed the sun to Primm, Nevada, where the 50-MW Silver State North Solar Project became Enbridge's first U.S. solar facility.

Our four solar assets in the U.S. and Canada have the combined capacity to supply the energy needs of nearly 15,200 homes, based on net generation figures.



Power Transmission

We entered the power transmission business to facilitate the import and export of power, allowing markets to have efficient and economic access to existing and new generation sources.

The Montana-Alberta Tie-Line (MATL) is a 300-MW, 230-kilovolt bi-directional transmission line that is helping move electricity across the U.S.-Canada border. The 215-mile line supports ongoing development of wind power generation, ensuring increased availability of electricity supply into the U.S. Pacific Northwest and Western Canada.

Through a joint venture called NextBridge Infrastructure, Enbridge partnered in developing the East-West Tie Line, a new transmission line, which will serve northwestern Ontario. The project has an anticipated in-service date of 2020.



Waste Heat Recovery

Waste heat recovery units offer an innovative way to capture the exhaust heat from natural gas turbines—which compress gas such that it can be transported through pipelines—and convert it into emissions-free electricity.

We have a 50% interest in NRGreen Power, which operates four waste heat recovery facilities along the Alliance Pipeline in Saskatchewan. These units have the gross capacity to generate 20 MW of electricity.

In late 2014, NRGreen Power commissioned its first waste heat recovery unit in Alberta at Alliance Pipeline's Windfall compressor station near Whitecourt. The Whitecourt Recovered Energy Project (WREP) adds 14 MW to the Alberta power grid.



Geothermal

As Oregon's first commercial geothermal power facility, Neal Hot Springs represents Enbridge's entry into geothermal energy, which taps into heat beneath the earth's surface to generate electricity.

Neal Hot Springs is the first commercial binary geothermal power plant to use a supercritical cycle. Water is injected below the earth's surface, pushing hot water up through a production well and converting it into steam through a turbine.

The water is then re-injected back into the ground. With an annual net production of 22 MW, the state-of-the-art project achieved final completion in 2013 and produces enough power to supply the needs of about 18,200 homes. Enbridge's portfolio of renewable energy assets includes offshore wind, onshore wind, solar, geothermal, power transmission, hydro and waste heat recovery.

Renewable Energy Project	Туре	Location	In-Service Date	Generation Capacity (MW)	ENB Ownership
Albatros	Offshore wind	Emden, Germany	November 2019	112	25.5%
Hohe See	Offshore wind	Emden, Germany	August 2019	497	25.5%
Rampion	Offshore wind	Brighton, England	January 2018	400	24.9%
Saint-Nazaire	Offshore wind	Saint-Nazaire, France	2023	480	50%
Blackspring Ridge	Onshore wind	Carmangay, AB	May 2014	301.3	25.5%
Cedar Point	Onshore wind	Limon, CO	November 2011	252.3	51%
Chapman Ranch	Onshore wind	Corpus Christi, TX	October 2017	249.1	100%
Chin Chute	Onshore wind	Taber, AB	December 2009	30	17%
Cruickshank (Ontario Wind)	Onshore wind	Tiverton, ON	September 2008	8.3	51%
Greenwich	Onshore wind	Dorion, ON	October 2011	98.9	51%
Keechi	Onshore wind	Jacksboro, TX	January 2015	110	100%
Lac-Alfred	Onshore wind	Amqui, QC	January 2013	307.5	34.4%
Magic Valley	Onshore wind	Harlingen, TX	October 2012	203.3	80%
Magrath	Onshore wind	Magrath, AB	July 2004	30	17%
Massif du Sud	Onshore wind	Buckland, QC	January 2013	153.8	40.8%
New Creek	Onshore wind	Moorefield, WV	December 2016	102.5	100%
Saint-Robert-Bellarmin	Onshore wind	Saint-Robert-Bellarmin, QC	October 2012	82	25.5%
SunBridge	Onshore wind	Gull Lake, SK	February 2002	11.2	25.5%
Talbot	Onshore wind	Ridgetown, ON	December 2010	98.9	51%
Underwood (Ontario Wind)	Onshore wind	Tiverton, ON	February 2009	181.5	51%
Wildcat	Onshore wind	Elwood, IN	December 2012	202.5	80%
Amherstburg II	Solar	Amherstburg, ON	August 2011	15	51%
Sarnia Solar Project	Solar	Sarnia, ON	November 2009	80	51%
Silver State North	Solar	Primm, NV	April 2012	52	51%
Tilbury	Solar	Tilbury, ON	December 2010	5	51%
Neal Hot Springs	Geothermal	Vale, OR	August 2013	22	40%
NRGreen	Waste heat recovery	Saskatchewan and Alberta	2006, '08, '11	34	50%
Wasdell Falls	Hydro	Washago, ON	December 2015	1.7	50%
Totals				4,121.8	

Power Transmission Projects	Location	In-Service Date	Transmission Capacity (MW)	ENB Ownership
Montana-Alberta Tie Line	Lethbridge, AB to Great Falls, MT	September 2013	300	100%
East-West Tie Line	Northwestern Ontario	Q22021	450	25%

Development Projects	Туре	Location	Generation Capacity (MW)	ENB Ownership
Courseulles-sur-Mer	Offshore wind	Courseulles-sur Mer, France	450	42.5%
Dunkirk	Offshore wind	Dunkirk, France	600	30%
Fécamp	Offshore wind	Fécamp, France	498	35%

The big picture

Enbridge's renewable energy projects—either operating or under construction—have the capacity to generate more than 4,100 MW gross of zero-emission energy (nearly 2,000 MW net). We are currently progressing with three development opportunities in France with more than 1,500 MW gross generation capacity. These assets provide a solid foundation for the future growth in the renewable energy and power transmission business.



> Enbridge Renewable Energy Operations and Projects

Willem Van der Ven talks about how companies like Enbridge have a critical role to play in balancing our commitment to environmental stewardship with the need to meet our energy and economic needs.



Willem Van der Ven Vice President, Power Operations

Tell us about Enbridge's renewable energy portfolio.

Our renewable energy portfolio has grown substantially since our investment in our first wind farm in 2002. At that time, wind and solar were still very new and hadn't been adopted widely across North America. Since then, we have now committed a total of \$6 billion to renewable energy and transmission projects currently in operation or under construction, including wind, solar, hydro, geothermal and waste heat recovery. We are committed to growing our offshore wind projects in Europe. Today, our renewables assets produce enough power to meet the energy needs of nearly 700.000 homes. There's no doubt that renewable investments are becoming an increasingly larger part of our portfolio.

What is Enbridge doing to meet growing global energy demands?

As the largest North American energy infrastructure company, our role is to ensure we meet society's need for safe, secure and affordable energy while at the same time reducing GHG emissions and protecting the environment. With global energy consumption expected to grow in the range of 30 to 40% by 2040, largely driven by a growing population and increased standards of living in developing countries, the world will need all forms of energy to support the transition to a low-carbon economy, while also keeping pace with the world's growing energy needs. We are committed to building new infrastructure for renewables and power and also decarbonizing existing oil and gas systems that will still fuel a significant portion of global energy demand.

Enbridge's renewable energy portfolio keeps us in lockstep with the global transition of energy consumption. We have an increased portfolio of renewable power assets that enables the company to invest in projects aimed at achieving a low-carbon future.



Veenu Narula Vice President, Power Business Development

Why is an energy transportation and distribution company such as Enbridge involved in the renewable energy business?

Enbridge is an energy company: we transport, distribute and generate energy. And we do this by leveraging all of our assets—wind turbines, natural gas processing plants and pipelines. Our renewables business looks, feels and performs like the rest of Enbridge: these are energy infrastructure investments with a risk profile that's consistent with our other businesses. We look at every one of our investments in the same way: as stable, lowrisk opportunities that deliver solid returns. That is why we are investing in renewables. New technologies are continuing to drive the cost of wind and solar energy to more competitive levels so that they offer good returns, which make them attractive investments that complement our diverse portfolio.

What kind of future does Enbridge see for renewable energy?

We see tremendous growth for renewable energy.

In 1996, the installed wind capacity in all of Canada was exactly zero. So when Enbridge began to invest in this space in 2002, we were extremely early to the investment game.

Now, Enbridge is one of the largest wind and solar power producers in Canada, with assets in the U.S. and a growing presence in Europe and a growing offshore wind presence.

In addition to increasing our footprint in other forms of energy, we are also investing in projects and companies that support our growing platform. For example, we've invested in leading-edge solar technologies through Morgan Solar and electricity energy storage systems through our investment in Temporal Power.

Awards & Recognition

Global energy leadership

Enbridge was named in 2018 among the Thomson Reuters Top 100 Global Energy Leaders. This list analyzes key performance metrics in the area of innovation, social responsibility, reputation, environmental impact and more..

One of Canada's best corporate citizens

Corporate Knights magazine has placed Enbridge among Canada's Best 50 Corporate Citizens for 17 straight years, through 2019. The ranking is the longest running of its kind and is determined based on a thorough analysis of contenders' publicly disclosed environmental, social and governance indicators.



BEST 50

At Enbridge, we exist to help fuel the quality of life for millions of people across North America. Whether it's oil, gas or renewable power, our North American energy network and our workforce of 13,600 people—connect millions of people with the energy that fuels people's lives, every day.

Liquids Pipelines

Enbridge operates the world's longest and most complex crude oil and liquids transportation system. We deliver more than 3 million barrels of crude and liquids every day, and we transport about 25% of the crude produced in North America.

Natural Gas Pipelines

Enbridge's natural gas pipelines connect North America's most prolific natural gas supply basins to the continent's largest demand centers, as well as liquefied natural gas (LNG) and Mexico export markets. Our network moves about 20% of all gas consumed in the U.S.

Utilities and Power

Enbridge Gas Inc. is the largest gas utility in North America by volume, serving about 3.7 million customers. Enbridge also has about 4,100 MW of gross renewable generation capacity, based on projects in operation or under construction—enough energy to power nearly 700,000 homes based on gross generation.



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