SPONSOR CONTENT

HYDROPOWER

63%
of Canada's electricity mix

3rd largest
hydropower producer in the world

zero
air pollutants

$35-billion
contributed to the Canadian GDP in 2013

Throughout its 130-year history, hydropower has helped develop remote regions, attracted industries, stimulated economic growth, nurtured innovation and created world-class expertise. Canada is a hydropower pioneer and leader.

Canada's unique climate change solution

Among the many headlines about laggard performance on climate change policy, it's an achievement that is easy to overlook: Canada is the world's third largest generator of clean and renewable hydropower.

"Number one is China, with 1.6 billon people; next is Brazil, with 230 million people; third is Canada with just 35 million – Canada boxes far above its weight class when it comes to hydro," says Jacob Irving, president of the Canadian Hydropower Association.

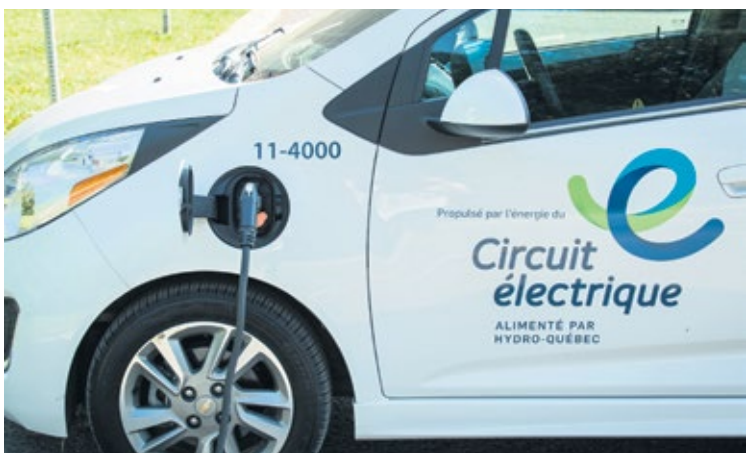
Hydropower currently accounts for 63 per cent of electricity generated in the country. It produces no air pollution and is "as close to zero greenhouse gas emissions as you can get," he explains. "The world needs low-carbon energy, and we can deliver."

Manitoba and Quebec now rely almost completely on hydropower (97 per cent and 98 per cent, respectively), with residential electricity prices in Winnipeg and Montreal hovering around seven cents a kilowatt-hour, the lowest in North America.

There is still ample potential to double Canada's hydropower capacity, building our economy while reducing greenhouse gas emissions. And in addition to the domestic benefits, there is significant export potential.

The United States uses an electricity generation system that is about 70 per cent non-renewable fossil fuel – a combination of coal and natural gas, with much higher emissions. "We are already a net exporter of electricity, and about 80 per cent of what we send is hydropower. Every terawatt-hour of hydropower Canada sends to the United States can displace between a half a million and a million tons of greenhouse gases." Current exports, about 40 terawatt-hours per year, represent less than one per cent of the U.S.'s annual electricity consumption.

There is clear room to grow Canada's clean electricity exports to the United States. One study found that just half of Canada's undeveloped hydropower capacity could power all of the current light-duty cars and trucks in Canada and about 25 per cent of the U.S. fleet, if they were all plug-in electrics. "Electrifying light-duty vehicles can't happen overnight, but we can proceed on that path with confidence, knowing we have large, clean, renewable electricity resources here in Canada," says Mr. Irving.



Canada has enough potential hydropower to fuel all light-duty cars and trucks in Canada and 25 per cent of those in the U.S. if those vehicles were converted to plug-in electricity. PHOTO: HYDRO QUÉBEC

"Canada still has plenty of hydropower sources," says Pierre Lundahl, president of Lundahl Environment Inc. and one of Canada's foremost clean energy consultants. "If we go further, we can help create a world where cars are electric and the batteries are recharged by electricity from renewable sources."

Hydropower also supports other renewable energy sources, adds Mr. Lundahl. "You can connect more wind and more solar if you have a sufficient amount of storage hydropower on the grid."

This is because hydro is extremely dispatchable – it can be ramped up or down quickly in response to demand. "Hydropower generation can be turned on and off faster than any other source," says Mr. Irving.

"It's also reliable and long-lasting – one of the first water turbines built in Canada, in 1891, is still in operation today. It could be making the electricity in my office right now. Hydro has huge, clear advantages when it comes to full-life-cycle and long-term economics."

"There is potential right across the country," says Mr. Lundahl. "There are no insurmountable obstacles. All experts agree that one of the best ways to reduce greenhouse gas emissions is to further electrify the economy by using less fossil fuel – in transportation, buildings, industrial processes and so on – and using more clean electricity instead. If the world gets serious about climate change, we'll need more renewable electricity."

Advances in reaching agreements with First Nations and a growing understanding that a price on carbon is ultimately inevitable have paved the way for future development, he adds. "Hydro is a well-proven technology and will be an extraordinary asset in the transition to a cleaner and more robust economy."

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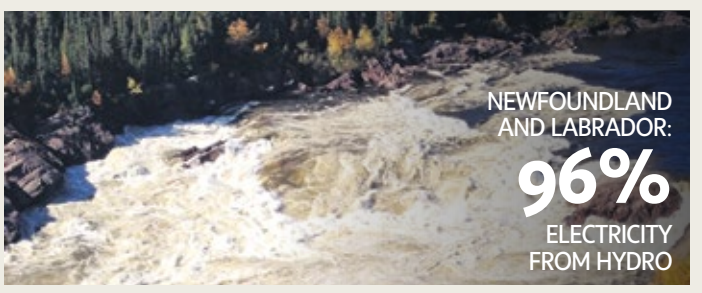

Construction on the 824-MW Muskrat Falls hydroelectric facility and 1,600 kms of transmission line in Newfoundland and Labrador began in late 2012. Construction is expected to be completed in 2018. The annual production from the generating station is enough to power on average 275,000 to 300,000 homes annually in Newfoundland and Labrador with emission-free energy. For the first time in history, the island of Newfoundland will be connected to the North American market – changing the energy landscape in the Atlantic region.

The Keeyask Generation Project is in the second year of construction on the lower Nelson River 725 kilometres northeast of Winnipeg. When in full service in 2020, it will have a capacity of 695 megawatts and produce an average of 4,400 gigawatt-hours of electricity each year. Keeyask is a joint effort between Manitoba Hydro and four Manitoba First Nations: Tataskweyak Cree Nation, War Lake First Nation, York Factory First Nation and Fox Lake Cree Nation.

Since 1947, John Hart Generating Station, in the City of Campbell River, has powered 74,000 homes and businesses on Vancouver Island. Upgrades to improve reliability and fix seismic issues started in spring 2014 and should be complete by 2019. Once complete, the $1.093-billion project will increase power output to serve 80,000 homes and businesses, have employed 340 people during peak construction, and have delivered new benefits to the community, including improved access to trails.

Online? Visit canadahydro.ca

Photo: Hydro Québec