Partners in Power

The United States' long energy relationship with Canada runs deep and wide.

BY JOCELYN DURKAY

When it comes to energy, Canada is much more than just the good neighbor to the north. Canada is the United States' largest foreign supplier of oil, natural gas and hydroelectricity, according to the U.S. Energy Information Administration.

With concern about the need to achieve energy independence, it's good to be reminded that the United States and Canada share one of the most integrated energy markets in the world, encompassing the production and distribution of resources and an interconnected electric grid.

Although the current debate and controversy over expanding the Keystone pipeline could complicate the relationship, it remains "a strong one, an interrelated one," says Montana Senator Elsie Arntzen (R), "not only involving the supply of energy, but also supplying a workforce."

Jocelyn Durkay covers energy issues for NCSL.

This collaborative relationship helps further North American energy independence and promotes economic security by directly supporting thousands of jobs in the energy industry on both sides of the border. In 2010, the exchange of petroleum products and natural gas between the two countries totaled nearly $100 billion.

Senator Elsie Arntzen (R) Montana

"The energy relationship between Canada and the United States has been crucial to our countries' economic successes in the past and will be an important part of North American energy security going forward," says Marcy Grossman, Denver-based Canadian Consul General.

Although many dynamics of this mutually beneficial relationship occur at the federal level, state lawmakers also play a crucial role. State and local policies regulate extraction, generation and production of energy resources in both countries, including streamlining permitting and determining state taxes and fees.

States also play a role in manufacturing the various equipment needed in energy production and extraction.

For example, lawmakers in the Northeast determine if Canadian hydropower is eligible for meeting state renewable energy requirements. In the West, Montana legislators convened representatives from industry, local communities and law enforcement to discuss how best to encourage an increase in processing and transporting crude oil while minimizing the impact on local communities.

Some states benefit economically from processing Canadian natural gas or using Canadian hydroelectricity, while others benefit from having a stable market in which to sell their energy resources. And all states benefit from having a friendly neighbor from which to buy energy.

It's Mutual

Energy resources—from petroleum, natural gas and coal to hydropower and nuclear power—and the electricity they produce flow in both directions.

Canadian hydropower helps states in the Northeast and Midwest meet their energy needs. Canadian uranium fuels U.S. nuclear production. U.S. coal has flowed to Canada for decades.

Natural gas flows in both directions based on the proximity of shale deposits in one country to processing facilities and large population centers on the other side of the border. In 2012, the United States imported almost 3 trillion cubic feet from Canada, and exported almost 10 billion cubic feet back to the neighbor to the north.

But petroleum products dominate the relationship. In 2012, Canada's vast reserves of oil helped make it the top supplier of imported petroleum to the United States, providing more than twice the imports than the next two largest suppliers—Saudi Arabia and Mexico—combined. The United States imports about 40 percent of the petroleum it consumes, and Canada supplies about 28 percent of that. Canada is the sixth largest producer of oil in the world, with most of its supply coming from regions in Alberta, Saskatchewan and British Columbia and off-shore drilling in the Atlantic Ocean. Essentially all Canadian crude exports are directed to Midwestern refineries via a large network of pipelines.

"New technology has been installed in one of the refineries in my district where the shale oil can be more efficiently drawn out and separated," says Arntzen. "That has prompted a larger trade from the Alberta oil shale, so that it can be refined on its way down to the Gulf Coast. Because of that, more Alberta shale oil is able to flow into Montana, and that increases economic stability and jobs in my community."

Oil flows in both direction as well, for the same reasons natural gas does—location of deposits, processing facilities and cities. Canada continues to serve as the only major export market for U.S. oil. The Energy Information Administration reports that approximately 305,000 barrels per day of petroleum products and 46,000 barrels of crude oil per day were exported to Canada in 2011.

Top 10

U.S. sources of imported crude oil and petroleum products

Canada
Saudi Arabia
Mexico
Venezuela
Nigeria
Colombia
Iraq
Ecuador
Angola
Russia

Source: U.S. Energy Information Administration

Joint Ownership

The United States and Canada also share joint ownership of the massive infrastructure needed to maintain energy security and reliability and the energy storage facilities for natural gas, crude oil and hydropower.

A network of electric transmission lines spans the two countries, helping them balance seasonal demand for electricity and reduce the number of power plants needed. Since electricity is more cost-effective and efficient when traveling shorter distances, cross-border trade is often more economical than shipping electricity far across the country.

Alaska, for example, is not connected to the same grid as the contiguous 48 states, so it is much more economical to share a portion of its electric grid with the Yukon province and buy its electricity from Canada.

This large, shared electric grid also helps the two countries balance seasonal peaks. Canada's demand for electricity generally increases in winter months when heating needs rise, while the United States uses more electricity in summer months for air conditioning. Sharing electric resources throughout the year helps both countries save money and electricity.

The two countries also are connected by a significant network of pipelines that transport crude oil, petroleum products and natural gas. Five petroleum export lines and 25 natural gas export pipelines bring Canadian fuel to states such as Idaho, Minnesota, Montana, New York and North Dakota. U.S. natural gas exports to Canada travel via pipelines from Michigan and northeastern states to eastern Canada.

The most controversial aspect of the partnership involves the highly publicized TransCanada Keystone XL Pipeline. Currently, the Keystone pipeline connects Hardisty, Alberta to Steele City,

By the Numbers

1
Canada's ranking in terms of U.S. imports

$100 billion
The annual value of the petroleum and natural gas trade between the United States and Canada

28%
Canada's portion of crude oil imported by the United States

13%
Saudi Arabia's portion of U.S. imported oil

1 million
Homes that can be powered by hydroelectricity imported from Canada

99%
Proportion of Canadian crude oil exports sent to U.S. refineries

NCSL's Legislative Energy Horizons Institute

The U.S.-Canadian energy relationship is at the center of NCSL's Legislative Energy Horizons Institute, an invitational immersion course in state energy policy. As technology advances and the energy system becomes more complex, policymakers are seeking opportunities to increase their understanding of how the system operates. The program trains participants on energy infrastructure and technology and provides insight into federal and state policy, as well as technology and market factors that influence this system. In a climate of high turnover and term-limited seats, the institute seeks to increase institutional knowledge of complex energy issues in state and provincial legislatures.

"We have developed a curriculum that provides a foundation for legislators to make better decisions," says Washington Representative Jeff Morris (D), director the Pacific Northwest Energy Horizon Project. "Instead of having to explain how systems work, infrastructure owners and operators can spend time discussing problems and potential solutions with legislators who have completed the Legislative Energy Horizon Institute."

Representative Jeff Morris (D) Washington

Each year, approximately 40 state and provincial legislators from the United States and Canada attend the two 30-hour intensive courses. Last year, the first portion of the institute met in Richland, Wash., to discuss electric generation, the electric grid, the North American fuel mix, how various energy sectors interface to produce and delivery energy, and state energy planning. The U.S. Department of Energy's Pacific Northwest National Laboratory hosted the institute, and attendees learned about smart grid and other technologies while touring the national lab. The second portion of the course met in October in Washington, D.C., and explored electricity regulation, federal policy, and state policy options.

The institute is coordinated by NCSL, the Pacific Northwest Economic Region and the University of Idaho, in conjunction with the Government of Canada and the U.S. Department of Energy.

The North American Electric Reliability Corporation

Coordination is essential to maintaining a consistent, trustful, mutually beneficial trade relationship. That's why the electric utility industry created the North American Electric Reliability Corporation (NERC) in 1968 to protect and promote the bulk-power system of North America. It's a nonprofit that develops and enforces reliability standards; monitors compliance and assesses penalties; determines seasonal and long-term reliability; educates, trains and certifies industry personnel; and coordinates security, including cybersecurity.

NERC's area of responsibility includes the users, owners and operators of the bulk power system—which serves more than 334 million people—in the continental United States, Canada and the northern portion of Baja California, Mexico. It is under the oversight oy the Federal Energy Regulatory Commission (FERC) and governmental authorities in Canada.

Neb., with two arms continuing to Cushing, Okla., and Pakota, Ill. The expansion would create a second line between Hardisty and Steele City, and extend a new line from Cushing to coastal Texas refineries and the international market.

Proponents argue that the existing pipeline and the expansion would have the capacity to transport 830,000 barrels of oil per day to Midwest and Gulf Coast refineries, creating jobs, supporting U.S. manufacturing, and increasing domestic energy security.

Several states have passed resolutions urging the federal government to approve the permit application for the TransCanada Keystone XL pipeline.

Opponents raise environmental and public health concerns and argue the expansion would not reduce U.S. dependence on foreign oil. Some contend it will also raise Midwestern gas prices because the bottleneck that forces Canadian producers to sell crude at a discount would be eliminated by the new pipeline.

In January, the U.S. State Department released a final environmental impact statement for the proposed pipeline expansion, It concluded that expanding the Canada-U.S. pipeline would not greatly increase carbon emissions because the Alberta oil sands will likely be developed even if the United States does not approve the permit application. The assessment also estimated that if trains, instead the pipeline, transported the oil, emissions would increase between 28 percent and 42 percent. No timeline has been given for when the State Department will issue a final ruling on the permit application.

Water Wonderland

Another huge energy resource Canada possesses is water. Hydropower uses the flow of water to spin turbine blades that are connected to a generator, creating electricity. Canadian hydropower, mostly from Québec, Ontario and Manitoba, comprises about 1 percent of all U.S. electricity and helps provide power to New York, New England and the Midwest.

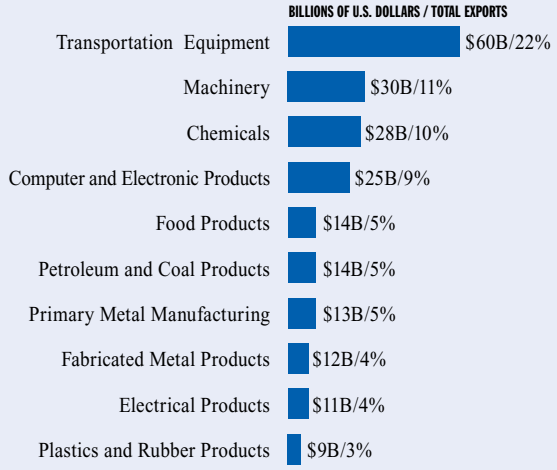
In fact, Canada generates 60 percent of all its electricity from hydropower, although in some places that percentage is much higher. Hydro-Québec, for example, is a government-owned public utility that generates 98 percent of the electricity it sells from hydropower.

"Hydropower exports are a major source of revenue for Québec. In 2012, our net electricity exports totaled 1,233 million Canadian dollars," says Québec National Assembly Member Scott McKay.

Hydropower is particularly important to New England states such as Massachusetts and Connecticut that must meet state renewable energy requirements. Additional transmission lines may be required to bring larger amounts of electricity to New England markets and several underground and above-ground lines have been proposed.

U.S. hydropower fuels Canada, as well. Under the Columbia River Treaty, Canada maintains the river's flow upstream in Brit-

Top Exports to Canada in 2013



ish Columbia in exchange for electricity produced downstream in hydroelectric facilities in four Pacific Northwest states—where hydropower encompasses as much as 66 percent of electrical generation.

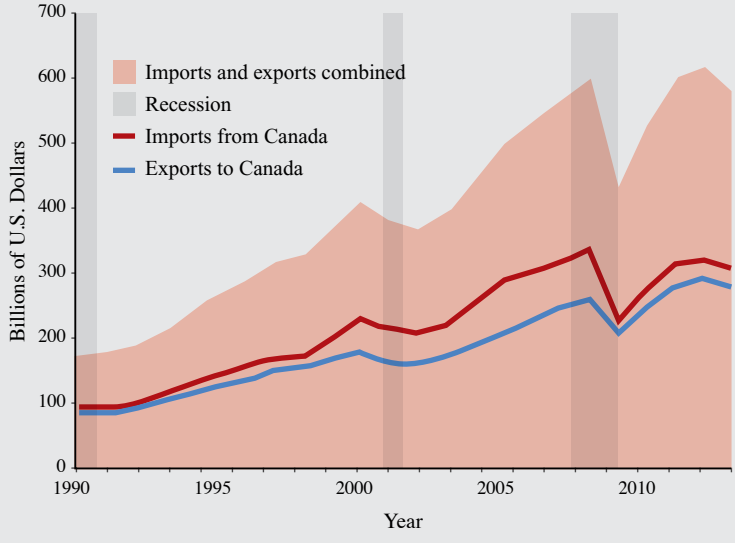
Still Strong

The recent increase in natural gas development and the Keystone XL debate have brought the long-standing U.S.-Canadian energy relationship to the forefront of public awareness, although the end results of these events are unknown.

What is certain is that the energy relationship between Canada and the United States will be an important part of North American energy security in the future, says Canadian Consul General Grossman.

"We both benefit not only from an economic standpoint," says Québec's McKay, "but also from a strategic standpoint, by being able to reduce our dependence on foreign oil."

U.S. and Canada Trade in Goods Has Increased Threefold Since 1990



Source: U.S. Census Bureau

Top Imports from Canada in 2013