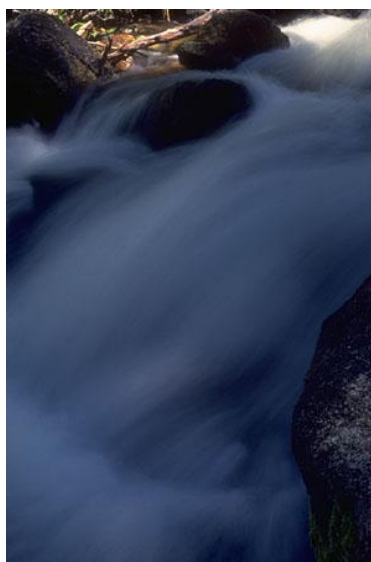


Vermont's Energy Future: The Hydro-Québec Factor

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Introduction: The Energy Situation in Vermont

Energy has quickly become a major issue at the international, national, and state levels. Vermont, like many states and countries, will be forced to overcome major challenges in the next several years to ensure an electricity supply that is reliable, affordable and clean.

One of the key issues on the horizon concerns how much power will come from Hydro-Québec, whose emission-free hydro-electric dams now provide one-third of the state's electricity.

This report looks to begin a public policy dialogue and understanding on the role that Hydro-Québec should play in Vermont's future. To do so, it reviews the history between Hydro-Québec and the State of Vermont, the benefits Vermont gains from this particular electricity supplier, and offers initial recommendations to policy makers as they gauge the optimal role for Hydro-Québec going forward.

It is important, as well, to understand the broader context of electricity issues impacting Vermont when considering the role Hydro-Québec should have in the state's future.

Fortunately, today Vermont has one of the cleanest electric supply portfolios in the country, dominated by renewable and non-carbon emitting sources. Vermont policy makers have generally favored a high quality, price stable, long-term, non-polluting power supply mix.

In the current market, these long-term contracts protect Vermont from the price volatility, and supply disruption plaguing many states dominated by short-term contracts. This is readily apparent in New England today as increasing natural gas prices have put upward pressure on wholesale electric rates.

Additionally, Vermont has small financially challenged utilities and has not seen a major new energy source come online in the last 20 years. It is imperative that discussions begin today, since it will likely take a minimum of five years to design and build any new major power source to meet future energy needs and/or replace existing sources. Hydro-Québec's contracts begin to expire in 2015.

Further complicating the matter is any new proposed power project sited in Vermont is likely to be challenged by Vermont's site permitting processes and to face fierce opposition from special interest groups. Such groups promote a multitude of reasons why projects should not be allowed, should be delayed, or should be drastically changed.

Public opinion and policymaker response to electric supply challenges vary. On the one hand there appears to be prevailing support for energy efficiency and distributed generation as opposed to large-scale transmission. Meanwhile utility planners and renewable energy advocates both favor a reliable grid network (i.e. new transmission) to maintain reliability and to support renewable generation projects. Ultimately all of these approaches are impacted by reaction at the local level to these different solutions. Whether it is commercial scale wind or a combined-cycle gas turbine, siting new generation in state is not an easy or clear endeavor.

An in-state power supply has the potential to insulate Vermont consumers from market volatility, which could make electricity costs more competitive. In the past year, Vermont's electricity rates have become more competitive in New England, but the region's electricity costs are still higher than the rest of the country.

Vermont's electricity supply, and its electricity costs, must be competitive with other states and Canada to ensure that the Green Mountain State stays a great place for employers to expand in, and relocate to, for years to come. Clean, secure, and affordable electricity is indeed important for the state's heritage and economic outlook.

History of Hydro-Québec in Vermont

Hydro-Québec is owned by the province of Québec. It holds the distinction of being North America's largest producer of electricity, serving residential and commercial users across Québec, and, at the wholesale level neighboring provinces and the United States.¹ Additionally, Hydro-Québec has built a successful energy-trading program, along with its generating assets.

Vermont and Hydro-Québec's relationship began in the early 1980s. Vermont, under the direction of Governor Snelling, contracted to buy 150 Megawatts (MW) of power, (about 15 percent of its peak load), for an initial 10 year period. For this to occur, and to ensure there was reliable delivery of power, a new transmission facility was needed. Hydro-Québec agreed to coordinate its system with the construction of such a facility, which was built by the Vermont utilities as a Vermont Electric Power Co. (VELCO) project, known as the Highgate Interconnection.

Highgate is a controllable direct current (DC) converter linking unsynchronized AC systems of Québec with New England's grid, which can carry up to 215 MW. Additionally, very large capacity DC transmission facilities were built from northern Quebec to delivery points in New Hampshire and Massachusetts. Vermont's utilities use these transmission facilities (plus additional smaller scale delivery facilities sourced directly in Québec) to deliver today's purchases from Hydro-Québec to retail customers throughout Vermont².

By 1987, and in order to extend and enlarge Vermont's original 10 year purchase from Québec beyond 1991, a group of fifteen Vermont utilities decided to band together as the Vermont Joint Owners³ and purchase long-term power from Hydro-Québec.

The new contract had a number of sub-schedules, the longest of which was for 25 years at a total committed cost of \$4 billion and required the utilities to take electric energy at an annual capacity factor of 75 percent⁴ for up to 310 MW. The contract stipulates that regardless of whether the utilities have less expensive short term purchase options in the wholesale market, they must still purchase it (considered a "take or pay"), and Hydro-Québec must supply it, on a firm basis.

Members of the Vermont Joint Owners and Hydro-Québec have nonetheless negotiated a number of mutually agreeable "sellbacks" of power and made other option agreements related to the original 1987 contract thereby improving the initial economics of the deal. For the Vermont utilities that have total power supplies in excess of their load obligations, the New England wholesale market is used to resell any excess power and the revenue is credited in Vermont's retail ratemaking process.

¹ "The New Power Generation," *World Report*, March 16, 2002, <http://www.worldreport-ind.com/canada/energy.htm>.

² William Deehan, CVPS Correspondence, August 29, 2005.

³ Frederick Bever, "Jeffords Says H-Q Effort Is a Reach," *Times Argus*, November 12, 1999, <http://www.timesargus.com/apps/pbcs.dll/article?AID=/19991112/NEWS/911120330&SearchID=73213462167645>.

⁴ Vermont Department of Public Service, *Vermont Electric Plan 2005*, January 19, 2005, 4-14.

When the contract was initially signed it was found by the Vermont Public Service Board to be economically and environmentally favorable relative to the alternatives and in light of expected high future energy prices. The Board specifically found the renewable nature of hydro power offered by Hydro-Québec to be environmentally attractive. Yet, by 1995 projections that power supply prices would continue to rise proved inaccurate. The prices for competing sources remained lower than expected, thus placing the cost of power from Hydro-Québec at around 6.5 cents per kilowatt hour (kWh) compared to then short term prices of 3.5 - 4.0 per kWh for market supply.

From the beginning, the utilities knew they would have to file rate cases with the Public Service Board, in order to recoup the costs of the contract which would increase retail rates to consumers. In the late 1990's, the Public Service Board disallowed a considerable portion of then "above-market" contract costs for the investor owned utilities that are members of the Vermont Joint Owners, which caused three of the utilities (Green Mountain Power, Central Vermont Public Service Corporation and Citizens Utilities) to face severe financial hardships, the first two nearing bankruptcy. The utilities asked Hydro-Québec to lower the contract prices but the company declined.

In the end, after an extensive investigation and the realization that the other municipal members of the Vermont Joint Owners could face financial hardships as well, which could affect municipal and state credit status, a settlement was reached allowing the investor owned utilities to begin to recover these expenses. The rating agencies that judge the ability of publicly held companies to repay debt, such as Standard & Poors, reacted to Vermont's regulation by downgrading its investor owned utilities from strong investment grade companies to weak investment grade (Green Mountain Power at BBB) and junk bond status (Central Vermont Public Service Corporation at BB). (Citizens Utilities have since sold its franchise area to the Vermont Electric Coop and has left Vermont).

In 1998 a severe ice storm caused significant damage to Québec's transmission system that delivered power to Vermonters, thus cutting off the delivery of power from Hydro-Québec for over a month. What ensued was an international arbitration proceeding initiated by the Vermont Joint Owners to determine if the Hydro-Québec outage was preventable or was "an act of God."

The arbitration panel ruled the power outage was due to the storm, not faulty power line design, and could not have been prevented. This kept the contract in force going forward, however the Vermont Joint Owners were awarded from Hydro-Québec approximately \$20 million for the electricity that was not provided.⁵

By 2005, the Hydro-Québec contract was economically competitive due to the volatility of fossil fuel and natural gas prices that have caused wholesale electricity market prices to spike.

Although the proceedings during the ice storm placed a strain on the relationship between Hydro-Québec and the utilities, representatives have worked to overcome those strains. Discussions have begun to consider the potential for new purchase agreements beyond 2015, but any decision reached is expected to hinge, in part, on whether Hydro-Québec is successful at meeting its growing demand in Québec, especially during peak winter periods.

⁵ John Dillon, "Panel rules Hydro-Québec contract stands," *Times Argus*, April 18, 2001, <http://www.timesargus.com/apps/pbcs.dll/article?AID=/20010418/NEWS/104180360&SearchID=73213462167645> (accessed July 6, 2005).

Benefits of the Hydro-Québec Contract

Vermonters have obtained a number of benefits from this contract.

Emissions free electricity – Hydro-Québec plays an important role in keeping our environment clean. Hydropower generates very few green house gases and no air pollutants that are responsible for smog or acid rain. Since Vermont is an environmentally conscientious state, the inclusion of Hydro-Québec in its electricity portfolio is crucial in maintaining its environmental values.

Renewable supply – The United States Department of Energy, and the international community, consider hydropower to be a renewable form of energy, since it relies on water for its fuel. As water is an abundant, naturally-replenished resource, there should be a sustainable supply, unlike fossil fuels that will be depleted.

However, Vermont law does not recognize Hydro-Québec as a renewable power source. If Hydro-Québec were deemed a renewable source, then more than half of Vermont's current electricity portfolio would be legally and formally characterized as coming from renewable energy sources. Without Hydro-Québec it is 17 percent.

Reliable power we can count on – Unlike some renewable sources, Hydro-Québec supplies controllable base load power, meaning it constantly generates electricity that can be scheduled when consumers need it. Furthermore, with the recent rise in market prices for energy sources (such as natural gas and oil) this contract protects the utilities that would otherwise be vulnerable to purchasing electricity on the spot market that can be considerably higher in cost.

Helps develop other renewable sources – As a base load source offering supply continuity, Hydro-Québec can help support the development of other new renewable sources. In particular, Québec is soliciting the development of large amounts of wind power which the massive Hydro-Québec system can effectively absorb using the storage capacity of its hydro reservoirs. Between the clean, emissions free power Hydro-Québec supplies, and the additional power to be created from the recently passed Renewable Portfolio Standards bill, Vermont is poised to continue its longstanding history of using clean energy sources that help protect its environment through 2015.

Ability to respond to peak demand periods - Hydro-Québec's reservoirs are capable of stocking the equivalent of New York's annual energy consumption.⁶ This affords the company the ability to amass power when demand is low, and supply power when demand is high. Vermont utilities schedule their use of Hydro-Québec power to maximize the amounts that are taken during peak load and pricing times and minimize the amount that flows off-peak within the 75 percent capacity factor constraint.

⁶ *World Report*, 2001.

Questions and Concerns

Is Hydro-Québec likely to pursue another long-term contract with Vermont, and under what circumstances is Vermont an attractive market?

Demand for electricity in Canada is projected to rise 1.3 percent a year until 2008⁷, and Hydro-Québec's strategic business plan for 2004 - 2008 projects net income to increase due to "higher electricity sales in Québec."

The 2004 Hydro-Québec annual report also points out the strategy in periodically holding back power for short term exports. "Our net exports declined by 36% in 2004 as a result of our decision to limit sales outside Québec during the first six months of the year. The temporary decline in industrial demand meant that Hydro-Québec production was able to resume some sales on these markets in the second half. Once hydroelectric developments currently under construction are commissioned, the division should have reasonable room to maneuver by 2012, which would allow it to keep up with exports".⁸

It is not clear whether Hydro-Québec will be able to keep up with demand in the province, especially at peak winter times, therefore it is too early to determine whether it will wish to make long term sales of electric capacity in high proportions in the future.

In the midst of extreme weather situations, will Vermont be one of the first to receive power if output is limited?

In January 2004, *Natural Gas Week* reported that, "With an extreme cold front moving through the Northeast last week, Hydro-Québec asked its 3.6 million residential customers to cut down on consumption of electricity during peak hours for the second time in as many weeks and stopped exports to other provinces and the US."

The 1998 ice storm revealed a risk of purchasing from Hydro-Québec that is different than purchasing on a more local scale. Hydro-Québec's electric system depends on power primarily produced in northern Québec and delivered over extremely long electric lines to New England.

This raises the question that if there is harsh weather that creates supply shortages or power distribution difficulties, will Vermont receive the power it needs, or will it be forced to look elsewhere when prices are especially high?

⁷ Hydro-Québec Strategic Business Plan 2004 - 2008, Hydro-Québec, 5
http://www.hydroquebec.com/publications/en/strategic_plan/2004-2008/index.html.

⁸ Hydro-Québec Annual Report 2004 - Hydro-Québec, 6
http://www.hydroquebec.com/publications/en/annual_report/2004/pdf/hydro2004en_complete.pdf.

Cost

As Vermont plans for the future, the cost and economic impact of electricity in the state is sure to be factored into the decision making process.

The cost of electricity from Hydro-Québec is roughly 6.5 cents per kilowatt hour, slightly higher than the average cost of electricity in the state which is today approximately 6.0 cents per kilowatt hour.

As of September 16, 2005, the quoted price for a forward contract for around the clock power for the year 2006 is 9.59 cents per kilowatt hour. In light of these figures, the Hydro-Québec fixed contract costs appear quite attractive for the coming year.

Near-Term Recommendations

The life of the contract with Hydro-Québec and the Vermont Joint Owners has entered its final 10 years, and it has not been determined whether it will be extended or if a different agreement will be reached. As the planning process begins, the Vermont Energy Partnership offers the following recommendations to decision makers concerning Hydro-Québec.

Formation of a task force – A task force comprised of representatives from the Vermont business community, utilities and energy experts should be assembled to study Hydro-Québec in depth. They should be able to provide necessary briefings to those involved in the negotiations and approval proceedings. The Vermont Energy Partnership will take the lead in organizing such a group in the near future.

Creation of a forecast – Forecasts should be created that would include all probable scenarios for when the Hydro-Québec contracts begin to expire in 2015. Examples include: Vermont without Hydro-Québec, Vermont with a long-term contract with Hydro-Québec, and Vermont solely purchasing on the spot market from Hydro-Québec. From there a complete cost-benefit analysis should be performed on all sectors to determine the scenario would best for Vermont, which can assist decision makers.