

Sustainably reinforcing the electricity supply for Eastern Montréal

Recommendations of the Board of Trade of Metropolitan Montreal as part of BAPE hearings on the 735 kV Chamouchouane—Bout-de-l'Île line project from Saguenay—Lac-Saint-Jean to Montréal



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Introduction

The Board of Trade of Metropolitan Montreal has over 7,000 members. Its mission is to be the voice of Montréal's business community and to promote the city's prosperity. It is involved in key areas of economic development, promoting a philosophy of action based on engagement, credibility, proactivity, collaboration and innovation. The Board of Trade also offers a range of specialized services to individuals and business of all sizes to support them in their growth at home and abroad.

This mission is what prompted the Board of Trade to submit this brief on the 735 kV Chamouchouane—Bout-de-l'Île line project from Saguenay—Lac-Saint-Jean to Montréal, as part of Bureau d'audiences publiques sur l'environnement (BAPE) consultations. A reliable energy supply is essential to a positive business environment and the economic performance of Greater Montréal. This is true for petroleum products, natural gas and electricity. Reliability clearly depends on having the capacity to move the volume required during normal and peak times, and on the ability to increase volume to reflect progressive growth in demand. For electricity supply, reliability also depends on redundancy in the transmission system.

The 735 kV Chamouchouane—Bout-de-l'Île line project from Saguenay—Lac-Saint-Jean to Montréal will increase the reliability of the electrical network for Southern Lanaudière and Eastern Montréal, where a number of major industrial facilities are located. The Board of Trade believes that this project is required to ensure a stable supply that can meet the anticipated growth in demand.

Failure to act could prove expensive

Since 1994, Hydro-Québec has added around 4,300 MW of new electricity production to its networks, in particular from wind farms (2010) and the Romain complex generating stations (2011). This was accomplished without adding a new 735 kV transmission line. Additionally, four transmission lines run from James Bay and the Côte-Nord to the Chamouchouane and Saguenay substations, and only three run to Greater Montréal, where the main consumption centres are located, thereby creating a funnel effect. This is in addition to significant growth in demand. In fact, in Southern Lanaudière, Hydro-Québec has gained some 50,000 subscribers in the past 10 years, representing an increase of 27%.

As a result, Hydro-Québec TransÉnergie is more limited in what it can do to guarantee network reliability. During the summer, increased transmission volume can outstrip the thermal capacity of certain 735 kV lines. During periods of increased demand in summer and winter, it is difficult for Hydro-Québec to remove lines from the network for maintenance. No 735 kV lines were removed on the outskirts of Montréal during summer 2013. If lines are removed for maintenance in the spring or fall instead, this encroaches on removals for project development.

The reliability of the electricity network is particularly important, not only to deal with the residential growth seen in Southern Lanaudière, but also for manufacturing and petrochemical companies in Eastern Montréal. This area is particularly important for the city's economic fabric, because it is an important source of wealth creation. According to the International Energy Agency, energy intensive sectors such as the petrochemical industry generate 20% of added value worldwide from industrial sources. Plus, the stimulation of the manufacturing and chemical sectors currently seen in the United States is very much tied to the drop in the price of all forms of energy. To be competitive and be part of this new North American industrial dynamic, local companies need to have the same advantage. Quebec is fortunate enough to have stably priced electricity, but to be competitive, businesses that open their doors in the province need access to a stable supply.

Occasional outages resulting from a fragile network can have a major impact on industrial activities. In the United States, Allianz Global Corporate & Specialty estimates that for a medium-

sized or large industrial company, a 30-minute power failure results in an average loss of US\$15,709. They also estimate that an 8-hour outage increases that loss to US\$94,000.

Two scenarios under consideration

To strengthen its main network, Hydro-Québec is considering two scenarios:

1. The massive addition of series compensation;
2. The addition of a new 735 kV transmission line.

When the network is equipped with series compensation, lines behave as if they were shorter, promoting better network behaviour. This technique is currently used on the network. The addition of a line involves building new infrastructure, which increases the network's transmission capacity.

Hydro-Québec has conducted comparative studies and a parametric economic analysis of the two scenarios. The main findings of these studies are presented in the following table.

Main findings for each of the scenarios studied	
Series compensation	735 kV transmission line
<ul style="list-style-type: none"> • Initial investment: \$692 million • Does not secure the supply for Montréal and Lanaudière • Will result in recurrent electrical losses of an estimated \$774.3 million • Will amplify constraints by reaching the thermal capacity of certain lines in the summer • Is not a long-term structuring solution 	<ul style="list-style-type: none"> • Initial investment: \$764.7 million • Eliminates the funnel effect at the Chamouchouane substation • Increases the power supply to the metropolitan loop • Responds to the growth in demand in Eastern Montréal and Southern Lanaudière • Facilitates network maintenance in the summer • Requires building 400 km of infrastructure through inhabited and natural settings

In light of these findings, it is clear to the Board of Trade that the addition of a 735 kV transmission line is the better solution. While it involves more work, this scenario is the more enduring and structuring solution, and one that will not only increase supply to the city, but will also deal with the anticipated growth in demand for electricity. Plus, compared with series compensation, this solution would reduce electrical losses, the economic impact of which is an estimated \$774.3 million over 57 years (50 years after commissioning). The economic benefits associated with building a new transmission line are an estimated \$1.1 billion, and the project will lead to the creation of 1000 full-time jobs over five years.

The analogy of the city's road network can be used to better understand the dilemma. Series compensation would be the equivalent of repairing the existing network, whereas a transmission line would be the equivalent of new infrastructure, such as a bridge or highway. Over the years, the road network has had patchwork repairs, with no significant improvements. Now that this network no longer meets the needs of a population that has grown and moved over the years, new infrastructure requiring major work over several years is being done in a rush against a backdrop of serious traffic jams. The city's residents and businesses are losing time and money to traffic, which, according to Ministère des Transports data, amounted to \$1.8 billion for 2013. In short, opting for

series compensation could create, in the future, a situation like the one we are seeing with the road network and would only postpone the construction of the required infrastructure.

Building a new line will necessarily have an impact on the environment and on residents who live along its route. However, the Board of Trade believes that Hydro-Québec has acted as a good corporate citizen by holding over 150 meetings in the areas concerned and proposing significant mitigation measures. The project and its route have undergone many changes to limit the impact on citizens.

Conclusion

Given the pressure on the Hydro-Québec network with the addition of around 4,300 MW of new electricity production since 1994, but also given the growth in demand from Eastern Montréal and Southern Lanaudière, work is required to ensure the reliability of the network and guarantee the electricity supply. Of the two scenarios studied, building a new 735 kV transmission line appears to be the one that best responds to concerns about a reliable supply to the metropolitan loop, growth in demand and the need for maintaining the network. Furthermore, the mitigation measures and new route proposed significantly reduce the impact on areas the new line will travel through.

This scenario also appears to be the most structuring and economically reasonable in the long term because of recurrent electrical losses associated with series compensation. Not only are economic benefits an estimated \$1.1 billion, but the construction would create the equivalent of 1000 full-time jobs over five years, which is welcome in a context of a sluggish economy. And while it is difficult to quantify, one of the main long-term economic issues of this dilemma relates to the risks and costs of a decline in network reliability and an increase in outages for individuals and businesses. Reliable access to low-cost energy is one of the building blocks of a business environment that is favourable to investment, and it is in society's interest to reinforce that access.

In light of the facts and arguments presented in this brief, **the Board of Trade recommends the completion of the 735 kV Chamouchouane—Bout-de-l'Île transmission line project from Saguenay—Lac-Saint-Jean to Montréal, as proposed by Hydro-Québec TransÉnergie.**