HYDRO-QUEBEC'S

NEW ENGLAND CLEAN ENERGY CONNECT (NECEC)

EXECUTIVE SUMMARY

The New England Clean Energy Connect (NECEC) is a major electricity transmission project designed to deliver hydroelectric power from Québec into the New England electricity market in the northeastern United States. The project primarily links Hydro-Québec's hydroelectric system with the regional power grid operated by ISO New England (ISO-NE).

The arrangement emerged from Massachusetts clean-energy procurement legislation and was formally advanced beginning in 2017. It involves a combination of long-term electricity purchase agreements, transmission infrastructure development, cross-border interconnection arrangements, and regulatory approvals. The principal electricity supply agreements associated with the project are generally structured as long-term arrangements extending for approximately 20 years, reflecting the long planning horizons of major hydroelectric and transmission infrastructure investments.

The project serves several purposes simultaneously:

- Deliver low-carbon electricity to New England
- Support regional greenhouse gas reduction goals
- Improve electricity reliability and winter energy security
- Provide long-term electricity price stability
- Expand Hydro-Québec's export market opportunities

The project is also significant from a Newfoundland and Labrador perspective because it demonstrates how transmission access, export infrastructure, regional interconnections, and long-term market positioning can influence hydroelectric development strategy and strategic optionality.

Recent developments involving Hydro-Québec's broader operating environment also highlight several emerging issues of strategic importance, including:

- Climate-related hydrological variability
- Reservoir management and reliability considerations
- Increasing regional electricity-system interdependence
- Growing electrification pressures
- The evolving strategic role of transmission infrastructure
- The increasing importance of operational flexibility and balancing capability within interconnected electricity systems

The paper also explores how regional transmission systems such as NECEC may increasingly function not only as export corridors, but also as:

• Reliability-support infrastructure
• Strategic reserve-management systems
• Energy-balancing pathways
• Climate-adaptation assets
• Long-term regional economic and strategic infrastructure

More broadly, the paper suggests that the evolving operational behaviour of interconnected northeastern electricity systems may provide early indications of how climate variability, electrification growth, transmission integration, balancing requirements, and regional reliability pressures could reshape the long-term strategic role of hydroelectric resources.

In this context, future hydroelectric value may increasingly derive not only from electricity production itself, but also from:

• Flexibility and balancing capability
• Seasonal dispatchability
• Reliability contribution
• Reserve support
• Climate resilience
• Operational optionality
• And participation within increasingly interconnected regional electricity systems

These themes also appear increasingly consistent with broader Canadian discussions concerning transmission expansion, interregional interconnections, balancing capability, reliability, climate resilience, and long-term electricity-system integration.

These issues overlap directly with broader discussions concerning Churchill Falls, post-2041 hydroelectric development strategy, transmission access, export optionality, and the evolving strategic role of Labrador hydroelectric resources within northeastern North American electricity systems.

The paper does not attempt to predict future electricity-system evolution or advocate a specific policy outcome. Rather, it seeks to identify emerging patterns and strategic considerations that may warrant broader long-term analysis and discussion within Newfoundland and Labrador.

GPT'S ANALYSIS:

Overview, Participants, Purpose, Strategic Implications, and Emerging Lessons

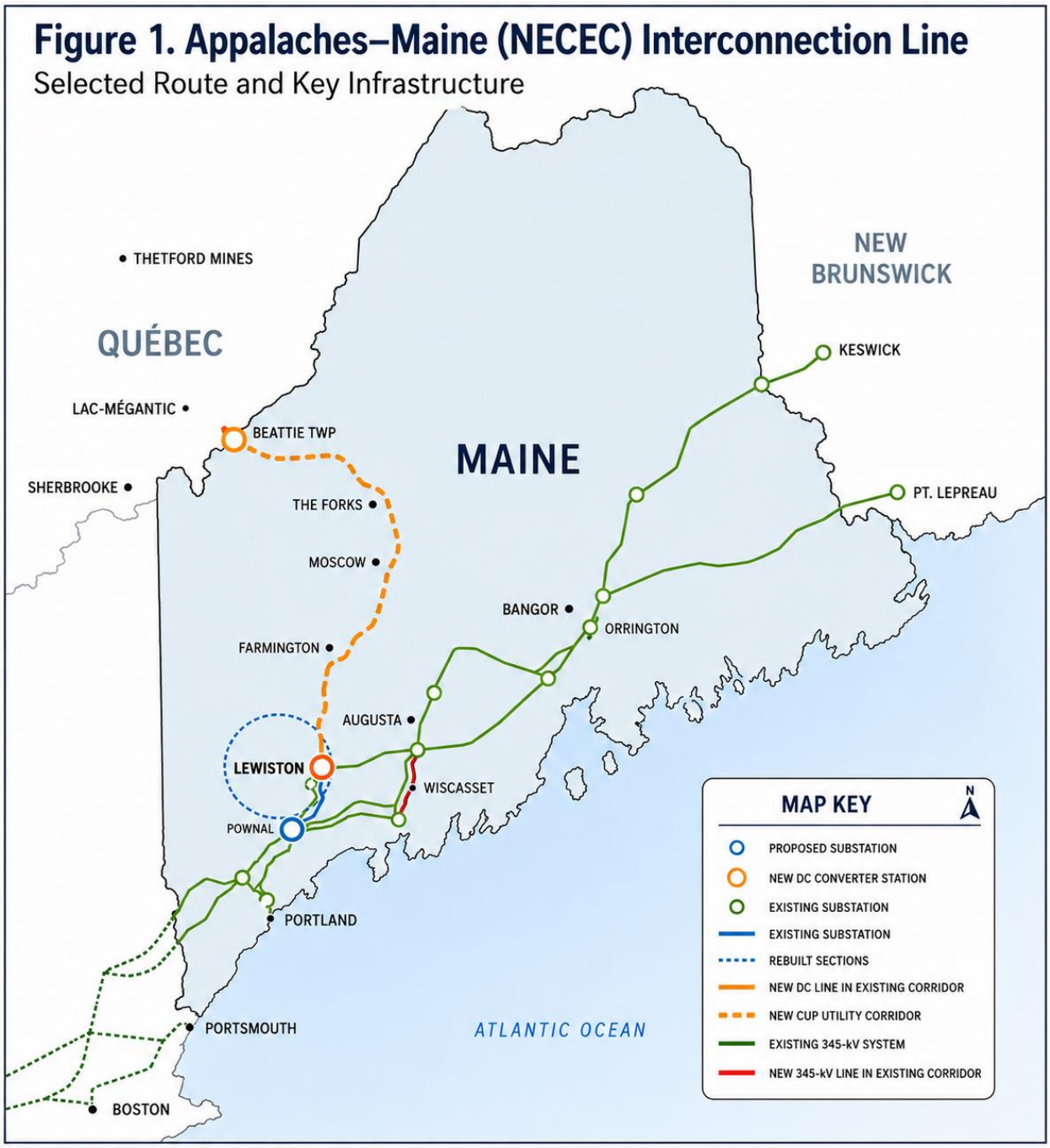
1. What is the New England Clean Energy Connect?

The New England Clean Energy Connect (NECEC) is a high-voltage electricity transmission corridor intended to transport hydroelectric energy from Québec into the New England electricity market.

The project has a transmission capacity of approximately 1,200 megawatts (MW) and can supply electricity to roughly 1 million homes.

The project includes:
• A transmission line from the Québec–Maine border into Maine
• High-Voltage Direct Current (HVDC) transmission infrastructure
• A converter station in Lewiston, Maine
• Upgrades to existing Alternating Current (AC) transmission systems in Maine
• Integration into the broader New England power grid

The electricity delivered through the system primarily originates from Hydro-Québec's hydroelectric generating facilities.



Source: *Hydro-Québec, Appalaches–Maine Interconnection Project materials.*

2. Main Participants and Signatories

The arrangement involves several layers of participation, including electricity suppliers, transmission owners, purchasers, regulators, and regional system operators.

Hydro-Québec

Hydro-Québec is the supplier of the hydroelectric power exported through the project.

Its role includes:
• Supplying hydroelectric energy to New England
• Constructing Québec-side transmission infrastructure
• Participating in long-term power supply agreements
• Expanding Québec's export market presence

Central Maine Power (CMP)

Central Maine Power (CMP) is the primary developer and owner/operator of the Maine transmission infrastructure associated with the project.

CMP is a subsidiary of Avangrid, which is itself associated with the international energy company Iberdrola.

CMP's responsibilities include:
• Developing the Maine transmission corridor
• Building and operating the transmission facilities
• Managing integration into the regional transmission system

ISO New England (ISO-NE)

ISO New England (ISO-NE) operates the regional electricity market and transmission system for the New England states.

Its responsibilities include:
• Grid reliability oversight
• Integration of the transmission project into the regional system
• Operational coordination and market administration

Massachusetts Electric Distribution Companies

Massachusetts utilities entered into long-term power purchase agreements associated with the project.

These utilities include:
• Eversource Energy
• National Grid
• Unitil

The agreements were established under Massachusetts clean-energy procurement legislation.

3. When Was the Arrangement Established?

Several key milestones define the development of the project.

Major Timeline

2017
Massachusetts issued a major clean-energy request for proposals intended to secure low-carbon electricity supplies.

2017–2018
The Hydro-Québec and Central Maine Power proposal was selected.

2019
Major long-term power purchase agreements received regulatory approvals.

2021
Construction activities commenced.

2021–2023
The project experienced legal, regulatory, and referendum-related challenges in Maine, resulting in delays and temporary stoppages.

2026
Commercial operation and energization of the transmission project were reported.

Although discussions and concepts existed earlier, the modern formal arrangement is generally considered to have originated from the 2017 Massachusetts procurement process.

The principal electricity supply agreements associated with the project are generally structured as long-term arrangements extending approximately twenty years, reflecting the long planning horizons associated with major hydroelectric and transmission infrastructure investments.

---

4. Purpose of the Arrangement

The arrangement was developed to serve multiple economic, environmental, and strategic objectives.

A. Deliver Low-Carbon Electricity

The primary public objective of the project is to reduce greenhouse gas emissions in New England by replacing portions of fossil-fuel electricity generation with hydroelectric imports from Québec.

This objective is closely connected to Massachusetts climate policy and broader northeastern United States decarbonization goals.

B. Improve Reliability and Energy Security

New England has historically faced concerns regarding:
• Winter natural gas shortages
• Electricity price spikes
• Dependence on natural gas-fired electricity generation
• Retirement of older generating facilities

Hydro-Québec's hydroelectric system is viewed as a relatively stable and dispatchable source of electricity capable of supporting regional reliability during high-demand periods.

C. Support Long-Term Price Stability

The arrangement relies on long-term electricity purchase agreements intended to provide greater price predictability and reduce exposure to fossil-fuel price volatility.

Supporters of the project argued that the arrangement could provide long-term consumer savings and greater electricity price stability.

D. Expand Hydro-Québec Export Markets

For Hydro-Québec, the project creates:
• Expanded access to northeastern United States electricity markets
• Long-term export opportunities
• Additional monetization of hydroelectric resources
• Greater strategic positioning within regional electricity systems

---

5. Structural Nature of the Arrangement

The New England Clean Energy Connect is not a single standalone contract.

Rather, it is a layered institutional and commercial framework involving:
• Long-term power purchase agreements
• Transmission ownership arrangements

• Cross-border interconnection agreements
• Regional grid operating agreements
• Federal and state regulatory approvals
• Environmental approvals and permitting processes

The arrangement required approvals and coordination involving multiple jurisdictions, including:
• Québec
• Maine
• Massachusetts
• United States federal regulators
• Environmental review bodies

---

6. Broader Relevance to Newfoundland and Labrador

The NECEC project is often discussed in Newfoundland and Labrador policy and energy discussions because it demonstrates several strategically important principles.

Transmission Access Matters

Transmission infrastructure can create major strategic and economic advantages by enabling access to external electricity markets.

Market Access Influences Bargaining Power

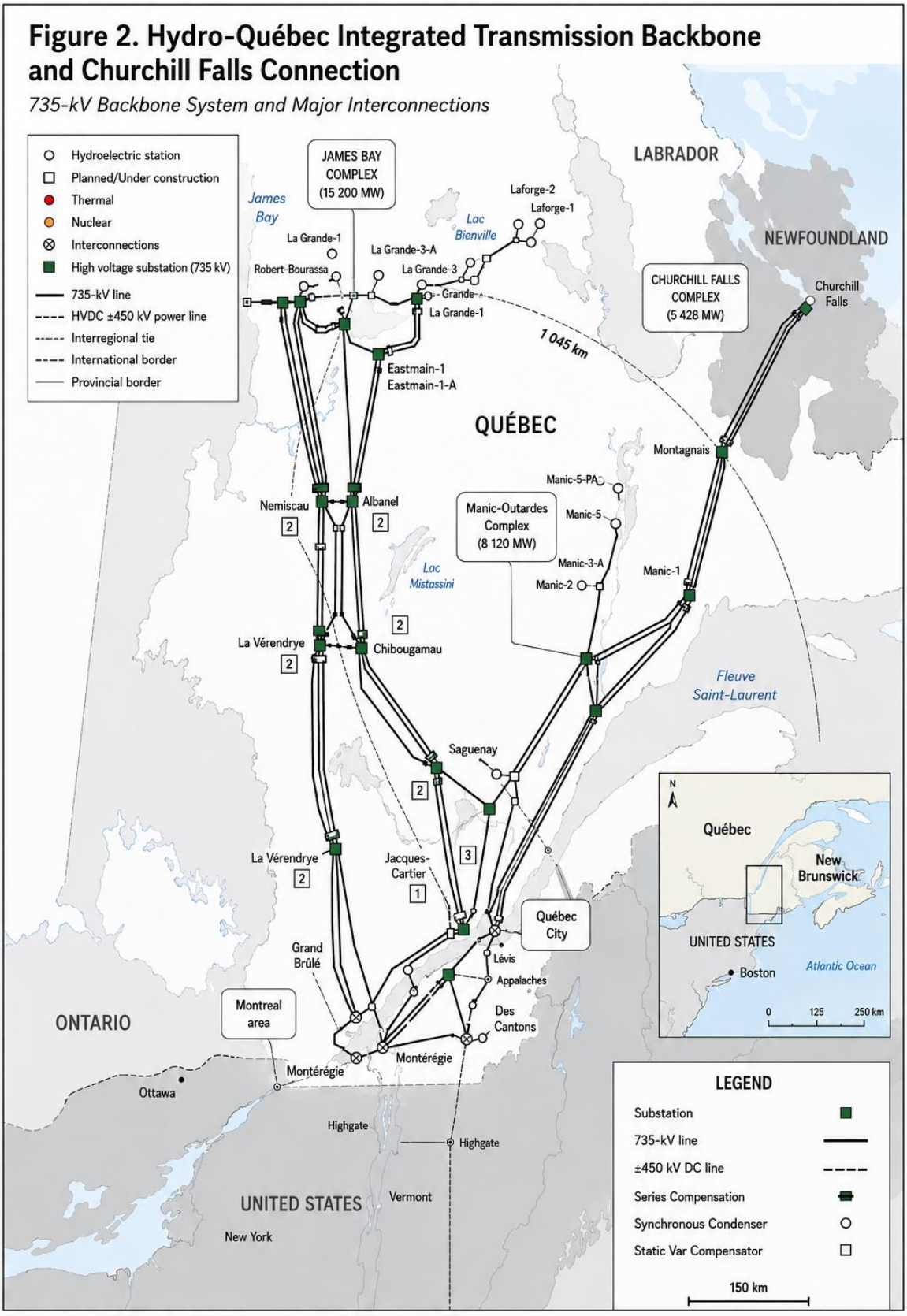
Access to large external markets can significantly influence the value and negotiating position associated with hydroelectric resources.

Long-Term Contracts Shape Revenue Stability

Long-term electricity arrangements can provide both revenue stability and strategic certainty.

Figure 2. Hydro-Québec Integrated Transmission Backbone and Churchill Falls Connection

735-kV Backbone System and Major Interconnections



Source: Hydro-Québec, 2024 Annual Report (transmission system overview).
Adapted for analytical purposes.

7. Regional Interconnections Create Strategic Leverage

The project illustrates how interconnections between jurisdictions can reshape regional electricity trade relationships and influence long-term energy policy.

Transmission infrastructure is not simply a technical delivery system. It can influence market access, bargaining power, pricing flexibility, and the long-term strategic position of participating jurisdictions. In some circumstances, access to transmission systems may become nearly as important as ownership of electricity generation itself.

The NECEC project demonstrates how transmission connections to external markets can strengthen hydroelectric producers' ability to secure long-term export opportunities and participate more directly in regional electricity systems. Once established, these transmission relationships can influence future market structures, infrastructure planning, and commercial arrangements for decades.

The project also demonstrates the strategic importance of access to large external electricity markets. Jurisdictions with strong transmission connectivity may have greater flexibility to direct electricity flows, respond to changing market conditions, and participate in evolving regional energy systems.

These issues overlap directly with broader discussions concerning Churchill Falls, transmission rights, export market access, and post-2041 hydroelectric development strategy in Newfoundland and Labrador.

One of the key long-term questions for Newfoundland and Labrador is not simply how much hydroelectric capacity may be developed in the future, but under what commercial and transmission conditions that electricity may ultimately reach external markets.

The broader policy implication is that future Churchill River development considerations may need to extend beyond generation economics alone and include careful consideration of transmission access, export optionality, regional interconnections, and long-term control over strategic electricity corridors.

---

8. Key Challenges, Constraints, and Emerging Lessons from the NECEC Experience

The NECEC project also illustrates that major regional transmission arrangements can encounter significant political, regulatory, legal, operational, and commercial challenges even when supported by long-term energy policy objectives.

Several important observations emerge from the project experience to date.

A. Political and Public Acceptance Challenges

One of the most significant difficulties encountered by the project involved political opposition and public acceptance within Maine.

The project became the subject of:
• Environmental concerns
• Land-use disputes
• Referendum initiatives
• Court challenges
• Regulatory delays
• Construction stoppages

Opponents argued that portions of the transmission corridor would affect forests, landscapes, and local communities. The project became politically contentious despite its broader climate-policy objectives.

This demonstrates that major interconnection projects may require not only commercial and regulatory approvals, but also sustained public and political legitimacy across multiple jurisdictions.

B. Long Development Timelines and Regulatory Complexity

The project illustrates the complexity of developing major cross-border transmission infrastructure.

Although the modern procurement process formally advanced in 2017, the project experienced:
• Multi-year regulatory proceedings
• Legal appeals
• Delays associated with state-level approvals
• Coordination challenges between jurisdictions
• Construction interruptions and revised timelines

Commercial operation was ultimately delayed for several years beyond initial expectations.

This demonstrates that large transmission projects may involve substantial timing uncertainty even after commercial agreements have been executed.

C. Transmission Access Does Not Eliminate Dependency Issues

The project also demonstrates that transmission interconnections can create new operational and governance complexities.

The NECEC arrangement required:
• Coordinated operating agreements
• Shared reliability protocols
• Joint outage coordination
• Operational control arrangements
• Cross-border dispatch coordination
• Market monitoring provisions

The project remains dependent upon coordinated operation between Hydro-Québec, ISO New England, and transmission owners in multiple jurisdictions.

This highlights that interconnection may increase market access while simultaneously increasing operational interdependence.

D. Long-Term Contracts Required Renegotiation and Adjustment

The project experience also illustrates that long-term infrastructure and electricity arrangements may require modification over time.

Delays, legal disputes, and changing conditions resulted in:
• Amendments to transmission service agreements
• Revised milestone dates
• Adjustments associated with changed legal conditions
• Increased project costs and revised commercial terms

This demonstrates that even highly structured long-term arrangements may require periodic adaptation as conditions evolve.

E. Strategic Value of Transmission Infrastructure Was Ultimately Reinforced

Despite delays and disputes, the project ultimately proceeded and entered commercial operation.

The underlying strategic rationale remained largely intact:
• New England sought stable low-carbon electricity imports
• Hydro-Québec sought expanded export access
• Regional reliability concerns continued

• Electrification and decarbonization policies increased long-term demand for transmission capacity

In this respect, the NECEC experience may ultimately reinforce the long-term strategic importance of transmission infrastructure and cross-border interconnections rather than diminish it.

F. Broader Relevance to Newfoundland and Labrador

For Newfoundland and Labrador, the NECEC experience may offer several broader strategic lessons:
• Transmission access alone does not eliminate political and regulatory risk
• Major interconnections can materially strengthen market positioning
• Cross-border transmission projects may require decades-long planning horizons
• Long-term governance and operating arrangements become critically important
• Strategic control over transmission pathways may become increasingly valuable over time

The project also demonstrates that future Churchill River development discussions may need to consider not only generation economics, but also:
• Market-access resilience
• Transmission governance
• Multi-jurisdictional approvals
• Long-term operational control
• Export diversification options
• Infrastructure flexibility under evolving North American electricity systems

---

9. Emerging Operational and Strategic Issues

The NECEC experience also illustrates that major regional transmission arrangements may evolve beyond simple export infrastructure and become part of a broader interconnected regional reliability system.

Recent developments suggest that climate variability, reservoir management, electrification growth, and increasing regional interdependence may be becoming more important strategic considerations within northeastern North American electricity systems.

In recent years, Hydro-Québec has experienced periods of reduced water inflows associated with drought conditions while simultaneously managing rising domestic electricity demand and expanding export commitments. During periods of peak winter demand and system stress, Hydro-Québec has at times both imported and exported electricity simultaneously through different regional interconnections.

For example, in March 2026 Hydro-Québec imported substantial volumes of electricity from New York while continuing major electricity exports through the NECEC interconnection into Maine and the broader New England market.

Importantly, these types of simultaneous import and export patterns do not necessarily indicate system weakness or an inability to satisfy contractual obligations. Rather, they may reflect the increasingly dynamic operational nature of interconnected regional electricity systems in which reliability management, reserve optimization, transmission constraints, seasonal balancing, pricing conditions, and long-term water-resource management may all influence electricity flows simultaneously.

In this respect, recent operational behaviour involving Hydro-Québec and regional interconnections such as NECEC may provide broader insight into how major hydroelectric systems are adapting to evolving conditions associated with climate variability, electrification growth, reliability pressures, and increasing regional electricity-system interdependen

The experience also demonstrates that hydroelectric systems, while highly flexible, remain influenced by hydrological conditions and evolving climate-related risks. Reservoir management, water inflows, domestic winter demand growth, and long-term electrification policies may increasingly influence future export flexibility and operating strategies.

As a result, regional interconnections such as NECEC may increasingly function not only as export corridors, but also as:
• Reliability-support systems
• Energy-balancing pathways
• Strategic reserve-management tools
• Climate-adaptation infrastructure
• Long-term regional flexibility assets

These developments may have broader implications for Newfoundland and Labrador and future Churchill River development considerations.

---

10. Broader Strategic Implications for Newfoundland and Labrador

The evolving operational environment surrounding Hydro-Québec and the NECEC project may offer several broader strategic observations relevant to Newfoundland and Labrador, Churchill Falls, and post-2041 hydroelectric development strategy.

Recent Hydro-Québec planning documents, including its Action Plan 2035 framework, increasingly emphasize:
• System flexibility
• Climate resilience
• Energy balancing
• Regional interconnections

• Reliability management
• Demand growth associated with electrification
• Strategic optionality within interconnected electricity systems

This suggests that northeastern North American electricity systems may be evolving away from a simple one-direction export model toward a more integrated regional balancing framework involving dynamic electricity flows, reserve-sharing, and greater operational interdependence between jurisdictions.

The broader significance of these developments may extend beyond the specific commercial arrangements associated with projects such as NECEC itself. More fundamentally, they may indicate that northeastern North American electricity systems are gradually evolving toward operating environments in which transmission integration, balancing capability, operational flexibility, reserve-sharing, and long-term system resilience become increasingly important strategic considerations.

From this perspective, transmission infrastructure may increasingly function not only as a delivery mechanism for electricity exports, but also as long-duration strategic infrastructure capable of supporting climate adaptation, reliability management, interregional balancing, and broader system flexibility within increasingly interconnected electricity networks.

Within this evolving environment, transmission infrastructure may increasingly acquire strategic importance beyond its traditional role as a delivery mechanism for electricity exports.

Transmission systems may increasingly function as:
• Reliability corridors
• Climate-adaptation infrastructure
• Strategic reserve-management tools
• Regional balancing pathways
• Long-term economic and geopolitical assets

Within this evolving context, large hydroelectric resources such as Churchill Falls may increasingly derive strategic importance not only from electricity production itself, but also from the flexibility, reserve support, balancing capability, seasonal reliability, and operational optionality they may contribute within broader interconnected regional electricity systems.

This may have important long-term implications for how future Churchill River development, transmission strategy, export arrangements, and water-resource planning are evaluated within Newfoundland and Labrador.

From a Newfoundland and Labrador perspective, these developments may reinforce the long-term strategic importance of:
• Transmission access
• Export optionality
• Interconnection diversity
• Strategic control over transmission pathways

• Flexible hydroelectric capacity
• Long-term water-resource planning

The experience may also suggest that future Churchill River development considerations should increasingly incorporate:
• Climate-related hydrological variability
• Long-term reserve-management considerations
• Regional reliability dynamics
• Interconnected market structures
• Multi-directional electricity trade opportunities
• Long-term infrastructure flexibility

In this context, Churchill Falls and potential future Churchill River developments may possess increasing strategic value not only as electricity-generation assets, but also as potential regional reliability, balancing, and flexibility resources within a changing North American electricity system.

These considerations may become increasingly relevant in evaluating future Newfoundland and Labrador hydroelectric strategy, transmission negotiations, market-access arrangements, and the broader long-term implications of post-2041 Churchill Falls development and Memorandum of Understanding (MOU)-related discussions.

More broadly, the NECEC experience illustrates that future hydroelectric strategy in northeastern North America may increasingly depend not only on ownership of generation resources, but also on transmission access, interconnection flexibility, climate resilience, operational adaptability, and long-term participation within increasingly interconnected regional electricity systems.

11. Emerging National Electricity-System Context

Many of the themes discussed in this paper appear increasingly consistent with broader trends now emerging within Canadian electricity-system planning and national energy policy discussions.

Canada’s recently announced National Electricity Strategy places growing emphasis on:
• Major electricity-demand growth associated with electrification
• Expansion of transmission infrastructure
• Greater east-west interprovincial interconnections
• Reliability and climate resilience
• System flexibility and balancing capacity
• Long-term strategic electricity infrastructure planning

In several respects, these themes align closely with issues highlighted by the NECEC experience and the evolving operational environment surrounding Hydro-Québec and northeastern North American electricity systems.

The strategy also appears to recognize that future electricity systems may increasingly depend upon:
• Interconnected regional networks
• Flexible dispatchable generation
• Balancing and reserve-sharing capabilities
• Climate-adaptation infrastructure
• Long-term transmission integration
• Hydroelectric storage and operational flexibility

Within this broader context, large hydroelectric systems such as Churchill Falls and potential future Churchill River developments may increasingly be viewed not only as electricity-generation assets, but also as strategically important components of long-term regional and national electricity-system resilience and flexibility.

The broader policy implication may be that future Newfoundland and Labrador hydroelectric strategy increasingly needs to be evaluated within:
• Regional interconnection frameworks
• National electricity-system evolution
• Climate-resilience planning
• Long-term transmission strategy
• Reliability and balancing requirements
• And the evolving strategic role of hydroelectricity within interconnected North American electricity systems

More broadly, the evolving operational behaviour of interconnected northeastern electricity systems may provide early indications of how climate variability, electrification growth, transmission integration, and regional reliability pressures could reshape the long-term strategic role of hydroelectric resources within Canada and northeastern North America.

In this context, the principal lessons emerging from the NECEC experience may extend beyond the project itself. The broader significance may lie in what the evolving operation of interconnected electricity systems suggests regarding the increasing strategic importance of flexible hydroelectric capacity, transmission interconnections, balancing capability, reserve management, and long-term system adaptability under changing environmental and economic conditions.

In this respect, the NECEC experience may provide useful insights into how transmission infrastructure, interconnections, hydroelectric flexibility, and regional operational coordination could become increasingly important components of future Canadian electricity-system development.

This paper was developed with research, drafting, editing, and analytical assistance provided through OpenAI's ChatGPT language model, version 5.5.