

Muskat Falls: A Case Study in Megaproject Mismanagement

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Introduction

The Muskrat Falls Hydroelectric Generating Station, along with associated infrastructure such as the Maritime Link, is located on the lower Churchill River in Labrador, Newfoundland and Labrador, Canada. This hydroelectric project demonstrates significant challenges in infrastructure financing, including inaccurate cost estimates, risk mismanagement, and heavy reliance on government support. These issues led to substantial budget overruns, increased public financial burdens, and widespread social opposition particularly due to environmental concerns, despite the project being promoted as a green energy solution. Understanding this case is significant for public policy and infrastructure planning, as it highlights the pitfalls of large-scale energy megaprojects and the urgent need for more transparent, inclusive, and accountable models of project delivery. The Muskrat Falls project ultimately illustrates how megaprojects are especially vulnerable to financial, managerial, and social risks.

Description of the Muskrat Falls Project

The Muskrat Falls Hydroelectric Generating Station, with a capacity of 824 megawatts, is a major energy infrastructure located on the Lower Churchill River in Newfoundland and Labrador, Canada. It is part of a larger initiative at the “Lower Churchill River at Gull Island and Muskrat Falls in Labrador” (“*Lower Churchill River Hydroelectric*”, n.d.) The aim of the project is to generate and supply clean, renewable energy to Newfoundland and Labrador as well as export it to Nova Scotia through interprovincial transmission infrastructure. The map of the Muskrat Falls project (Appendix A, Figure 1) visually illustrates the scale of the development and its intended energy distribution across provinces. The Labrador-Island Transmission Link spanning 1,100 km connects Muskrat Falls to Newfoundland’s electricity grid and with a portion running beneath the

Strait of Belle Isle. Additionally, the Maritime Link spanning 180km undersea enables the transfer of power from Newfoundland to Nova Scotia, reinforcing the project's regional significance.

Planning for the project began in the 2000s when Newfoundland and Labrador Hydro developed an energy plan for the province. Construction officially commenced in 2013 (Massell, 2016). Furthermore, as noted by Hughe (2022), "In late September 2020, Muskrat Falls produced first power," and "In late November 2021, Muskrat Falls was integrated into Newfoundland and Labrador's electricity system." Despite these milestones, the station faced significant delays. Hughe also points out that by 2030, Nova Scotia Power is required to supply 80 per cent of its electricity from renewable sources. However, two years after integration, Nova Scotia Power's customers had received only 29.6 per cent of their power from renewables (Hughe,2022). This raises concerns about the effectiveness of interprovincial energy transmission and reliance on hydroelectric imports.

In 2007, the Government of Newfoundland and Labrador created "Nalcor Energy, a provincial Crown corporation, sanctioned and built with the authorization of the Government of Newfoundland and Labrador" ("*Executive Summary*" 2020, Vol.1, p. 1) to lead the development of the province's energy sector. Furthermore, the Government of Nova Scotia's utility, originally a Crown corporation that was later privatized and is now known as "Emera Inc. [to construct] a high-voltage transmission line between the Island of Newfoundland and Nova Scotia to enable energy generated in this province to be transferred to Nova Scotia" ("*Executive Summary*," 2020, Vol. 1, p. 1). To carry out such an ambitious project, Nalcor relied on private sector involvement through a series of contracts awarded to companies with specific technical expertise.

Nalcor Energy began selecting private entities that specialized in various aspects of the Muskrat Falls project. One contract “was awarded in 2013 to Astaldi Canada Inc, a subsidiary of a major Italian multinational construction company” (“*Executive Summary*” 2020, Vol.1, p. 30). Astaldi was chosen for the construction of the powerhouse, spillway, and transition dams at Muskrat Falls. According to Volume 1 of the Executive Summary, Nalcor selected Astaldi because it had the lowest bid and a better technical rating, even though its proposed price was \$400 million over the project estimate. Similar Canadian bids were significantly higher, and Nalcor believed those companies were too busy and overly cautious (“*Executive Summary*” 2020, Vol.1, p. 30). Furthermore, the report also stated that Nalcor was aware that Astaldi lacked experience in cold-weather construction an oversight that points to a pre-correction phase where shortcuts may have been taken in the decision-making process.

Nalcor chose SNC-Lavalin to take advantage of their “‘expertise in hydro development to bring essential know how and specialist resources to the Project and hired SNC to meet this requirement. The Engineering, Procurement, and Construction Management contract was awarded to SNC on February 1, 2011” (“*Executive Summary*” 2020, Vol.1, p. 23). However, the report also states that Nalcor and SNC began experiencing issues early in the partnership, where “Nalcor’s concerns included the slow rate at which managerial positions were being filled, the poor quality of personnel, the lack of proper Project control systems and missed deliverable deadlines” (“*Executive Summary*” 2020, Vol.1, p. 23-24). Following challenges with SNC-Lavalin, Nalcor continued awarding contracts to other private firms for key components of the project.

The contract for constructing the Labrador-Island Link and Labrador transmission lines was awarded to North American Valard, described as an “experienced utility contractor [who] was found by Nalcor to be the only suitable bidder for the transmission line contracts” (“*Executive Summary*” 2020, Vol.1 , p. 32). However, transmission cost overruns occurred, partly due to inadequate right-of-way preparation, as “Nalcor’s chosen approach to handling the ROW contract was intended to save costs” (“*Executive Summary*” 2020, Vol.1 , p. 32), Valard had warned Nalcor about potential delays and increased costs. Additionally, “a French multinational company was awarded three major contracts (“*Executive Summary*” 2020, Vol.1, p. 34). While not a major contributor to cost overruns, the company faced implementation issues due to delays by Astaldi, protests, and coordination problems with Nalcor’s lower-level management. (“*Executive Summary*” 2020, Vol.1, p. 34). These complications highlight deeper issues in project coordination and risk management, reflecting how early cost-saving decisions and fragmented oversight contributed to delays and financial strain across multiple components of the Muskrat Falls project.

Projects like Muskrat Falls play a critical role in advancing transformative energy initiatives by expanding the use of renewable energy sources and reducing reliance on oil and other fossil fuels. Such infrastructure is especially important in the context of the ongoing climate crisis as it contributes to combating global warming while enhancing energy security and creating opportunities for energy exports one of the key goals of this mega infrastructure project. However, projects of this scale have become controversial public undertakings, often plagued by cost overruns and financial mismanagement and lack of effort in addressing indigenous communities’ concerns. A report studying the failures of hydroelectric dam projects and similar large-scale

developments in Canada including Muskrat falls and beyond notes that “a project’s cost and schedule are frequently and systematically underestimated. The root causes of these underestimations can be found in optimism and political biases” (Flyvbjerg & Budzier, 2019, P33). Therefore, examining case studies like Muskrat Falls is a crucial step in ensuring that large scale projects intended to benefit the public can achieve their goals effectively and avoid repeating past mistakes.

Financing and structure

This section examines the financial structure of the Muskrat Falls project and mentions of associated infrastructures, detailing its funding sources, debt arrangements, and the public-private dynamics that shaped its economic outcomes. In 2012, at the time of sanctioning, the Muskrat Falls project was estimated to cost “\$6.2 billion plus \$1.2 billion in financing costs. [However, by 2020] the actual construction costs of the Project [was estimated at] \$10.1 billion plus \$2.6 billion in financing costs” (“Executive Summary,” 2020, Vol. 1, p. 2). This substantial cost overrun placed significant pressure on public finances and raised concerns about financial oversight and risk assessment throughout the project's development.

According to Massell (2016), in terms of ownership distribution for the Muskrat Falls project and its associated infrastructure, the Muskrat Falls Generating Station is owned 100% by Nalcor, making it fully public. The Labrador Transmission Assets are jointly owned, with 71% held by Nalcor (public) and 29% by Emera (private) (see Appendix A, Figure 1). Furthermore, based on the *Pre-Sanction Events Report* (2020), the distribution of costs within the project reveals that the Maritime Link (ML), developed by Emera, cost \$1.75 billion, while the Muskrat Falls Project (MFP), Labrador Transmission Assets (LTA), and Labrador-Island Link (LIL) all managed

by Nalcor had a combined cost of \$12.7 billion. This means Nalcor bore approximately 87.9% of the total \$14.45 billion in project costs, while Emera contributed 12.1%. These figures include construction costs, interest during construction, and other allowances such as the Allowance for Funds Used During Construction highlighting the full financial scope of the development (see Appendix B, Table 1). This breakdown highlights the project's ownership structure and the respective financial contributions of its public and private partners.

A significant portion of the funding for the Muskrat Falls Generating Station came from direct public investment by the Government of Newfoundland and Labrador. Therefore, the province bore a substantial share of the project's financial burden. As stated in the official inquiry report, "Nalcor would construct, own and operate the Muskrat Falls generating station and the LTA and would be fully responsible for the cost of the development of these assets" (*Pre-Sanction Events*", 2020, Vol. 2, p. 152). To ensure that Nalcor could fulfill this responsibility, the provincial government issued a formal commitment letter in 2011, guaranteeing both initial and contingent equity support. This letter, addressed to Nalcor's CEO by the former Premier of Newfoundland and Labrador Kathy Dunderdale, clearly outlined the province's intention to financially back the project providing "the base level and contingent equity support that will be required by Nalcor to support successful achievement of in-service for MF, the LTA and the LIL, in cases with and without the participation of Emera" (Dunderdale, 2011, p. 2). This political and financial commitment was crucial in building lender confidence and enabling Nalcor to secure low interest borrowing for the project.

The lower interest rates for borrowing were made possible in part due to the federal government's loan guarantees, which reduced financing costs and protected lenders. This complemented the provincial government's financial commitment, as discussed in the previous section. Moreover, as noted in the official report, "in November 2010, GNL and Nova Scotia had initiated discussions with the Government of Canada for a federal loan guarantee that would reduce the financing costs for the Project and the Maritime Link" (Executive Summary, 2020, Vol. 1, p. 27). This federal support played a crucial role in offsetting increased costs and ensuring the project's financial viability. The positive impact of federal backing on bond issuance is evident in the case of Muskrat Falls. As noted by DBRS Morningstar which confirmed "the ratings of the 2013 and 2017 Guaranteed Senior Bonds (together, the Bonds), totalling \$7.9 billion, issued by Muskrat Falls/Labrador Transmission Assets Funding Trust and Labrador-Island Link Funding Trust (together, the Issuers) at AAA with Stable trends" (DBRS Morningstar, 2021). This positive rating reflects the confidence that federal guarantees create in financial markets. However, despite these supportive measures and high credit ratings, the project continued to face significant financial difficulties. As noted by Magas (2021), "The Trudeau government has agreed to a tentative, C\$5.2-billion bailout for Newfoundland and Labrador's troubled Muskrat Falls hydropower megaproject." (Magas, 2021) This bailout underscores the long-term financial strain the project placed on public resources, raising concerns about the effectiveness of initial oversight and risk management.

The case of Muskrat Falls presents a unique example of a public-private partnership, shaped by the scale and complexity of the project. As previously discussed, the Muskrat Falls Generating Station is 100% publicly owned and funded by Nalcor, making it a fully

public component. However, a clearer example of public-private collaboration emerges in other parts of the project, particularly with Emera's involvement in the Labrador-Island Link and the Maritime Link. Despite this, the core of the project Muskrat Falls itself remained a high-risk, publicly funded venture. As Saulnier (2020) explains, "It would have been excellent to find a private sector partner who would have taken on the risks of cost overruns for Muskrat Falls. Unsurprisingly, a private partner is never to be found on a high-risk project providing low-cost insurance" (Saulnier, 2020, p. 40). This highlights the private sector's reluctance to engage in projects with significant financial risk, leaving the burden of cost overruns largely on public institutions. This is further supported by the Commission of Inquiry, which found that "Emera's investment in the Defined Assets is effectively capped, subject only to the sharing of cost overruns on the ML, which leaves Nalcor fully responsible for the cost overruns of the Project" (*Pre-Sanction Events*, 2020, Vol. 2, p. 158). This confirms that even within a public-private partnership arrangement, significant financial risk remained with the public sector, particularly in the case of the Muskrat Falls Generating Station, which was entirely publicly funded and owned. Meanwhile, Emera stands to profit from the transmission infrastructure by selling access to the power generated by Muskrat Falls based on the user-fee principle, thereby generating steady revenue from 20% power generated from Muskrat Falls for the next 35 years (Appendix A, Figure 1) with comparatively lower financial risk.

Analysis of Core Concepts

Cost overruns in megaprojects are not uncommon, but the case of Muskrat Falls reflects a deeper institutional pattern of strategic underestimation and mismanagement. These types of infrastructure projects are designed to last for decades and are a core part of a region's economic strategy, not only by meeting the energy demands of urban areas but also by contributing to long-

term economic development at the regional and national levels. In fact, “investments in renewable energy projects can help reduce poverty by providing new job opportunities in rural areas” (Virgilijus Dirma et al., 2024, p. 7). Therefore, investing in energy infrastructure, particularly in the renewable sector, can bring both social and environmental benefits. However, the case of Muskrat Falls is a common example of infrastructure failure and mismanagement. As one study found, “The average, randomly chosen project took 73.4 months to construct and had a cost overrun of \$1 billion (or a mean budget escalation of 66%). Overall, 75.1 percent of projects in the sample experienced a cost overrun” (Sovacool et al., 2014, p. 114). These findings reveal that systemic weaknesses in planning, forecasting, and accountability continue to undermine the successful delivery of large-scale renewable energy projects. Furthermore, the report on issues with Muskrat Falls also stated, “Project planners and managers need to be held accountable for the plans and estimates they produce, just as structures and processes are in place to hold contractors accountable for their contracts” (Flyvbjerg & Budzier, 2019, p. 34). These issues not only reflect failures in project management but also raise broader questions about how large-scale public infrastructure is planned and justified. Projects like Muskrat Falls often function as natural monopolies due to their high capital costs and the impracticality of competition. They are also expected to benefit from economies of scale, lowering costs over time through increased output. However, when strategic miscalculations and cost overruns occur, these benefits are diminished. As seen in Muskrat Falls, Nalcor’s miscalculations during the pre-sanctioning phase and in selecting private partners show how the potential productivity of such projects can be outweighed by risks that ultimately fall on governments, taxpayers, and the public.

The case of Muskrat Falls is unique in that the generating station is entirely publicly owned and operated, with private firms engaged only as contractors for construction and infrastructure delivery. However, associated infrastructure such as the Maritime Link to Nova Scotia benefits directly from the electricity generated at Muskrat Falls through a public-private partnership. These components were made attractive to private investors through government-led de-risking mechanisms, including federal loan guarantees and bond structures, which reduced financial exposure and secured favorable financing terms given their high bond rating as well. This dynamic is reflected in O'Neill's observation that "an important part of the financialisation process for infrastructure is the stabilisation of returns and the protection of these returns from competition. In the case of many urban infrastructure assets, this protection flows from an asset's monopoly status" (O'Neill, 2019). Muskrat Falls, functioning as a natural monopoly, enabled the government to structure a financially secure arrangement for the Maritime Link by guaranteeing Emera access to 20% of the power output for 35 years, supported by federal loan guarantees for the muskrat falls project and positive returns that shielded the private partner from cost over runs of the hydroelectric dam. The problem gets worse when the burden of both cost increases and the protection of private partners comes at the cost of putting pressure on the public, where "If the construction of a large-scale infrastructure runs over budget (like the Muskrat Falls project) no politician or government official will lose their own money or face any meaningful consequence. It's a basic principle in economics that people are far more careful with their own money than other people's money." (Yunis & Aliakbari, 2021). Therefore, the pressure will be put on taxpayers and residents through rate hikes, and if the government tries to cap rates, the difference still comes out of the taxpayer's pocket. Moreover, this money could have been used to invest in more social infrastructure alongside electricity generation.

This paper has so far focused on the overall economic viability and management concerns of the Muskrat Falls project, without emphasizing its broader social and environmental impacts. Contemporary infrastructure development, even under the banner of renewable energy, can perpetuate colonial dynamics and patterns of resource extraction. The Muskrat Falls project was no exception. While promoted as a green energy initiative, it raised significant environmental concerns, particularly regarding methylmercury contamination. Moreover, in CIMFP Exhibit P-04250, the Independent Expert Advisory Committee (IEAC) recommended measures to mitigate contamination, including “capping wetlands.” This recommendation was supported by the voting members, such as the Nunatsiavut Government, the NunatuKavut Community Council, and affected municipalities. The Innu Nation also endorsed the wetland capping proposal. However, Nalcor proposed an alternative: instead of capping which would cause delay in the project. they suggested creating a fund for food storage and distribution as a more appropriate solution. (Chippett, 2019, p. 1–2). Therefore, showing that the project also followed a pattern of exploiting land and resources without the full, informed consent of Indigenous communities, further reinforcing historical injustices under the excuse of clean energy progress.

This concern was also raised by Deborah Cowen, a University of Toronto geography professor, who stated, “If your land claim is contingent on support for a dam, that's really not meeting the standards of free, prior and informed consent” (“Professors Pen Protest Letter to PM over Muskrat Falls”, 2018). This is further supported by a study by Bernauer (2023), which focuses on how the duty to consult has historically provided weak legal mechanisms for Indigenous communities: “If the duty to consult can be satisfied by a process so fraught that a public inquiry determined it was unfair to Inuit, the duty would appear to be of limited value to Inuit seeking to

protect a hunting way of life in the face of capitalist expansion.” (Bernauer, 2023) This underscores that the Muskrat Falls project failed to obtain full and informed consent from affected Indigenous communities, and untimely perpetuating colonial dynamics.

Conclusion

The Muskrat Falls project serves as a cautionary tale about how renewable energy infrastructure, despite its environmental goals, can reproduce systemic injustices. Although Muskrat Falls was entirely publicly funded and intended to provide long-term energy security and economic growth for the region, the project was plagued by cost overruns, mismanagement, and insufficient oversight. This shifted financial risks onto the public while insulating private actors like Emera through government guarantees. Despite being promoted as a green project, Muskrat Falls also caused environmental harm to surrounding lands that Indigenous communities depend on for their livelihood. Their concerns were largely sidelined, reinforcing colonial dynamics and undermining public trust. While Canada must continue to invest in climate solutions and infrastructure to address climate change, the lessons from Muskrat Falls highlight how not to approach such developments. Future projects must prioritize transparency, equity, and genuine inclusion of Indigenous voices from the beginning.

Word Count: 3331

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Appendix A

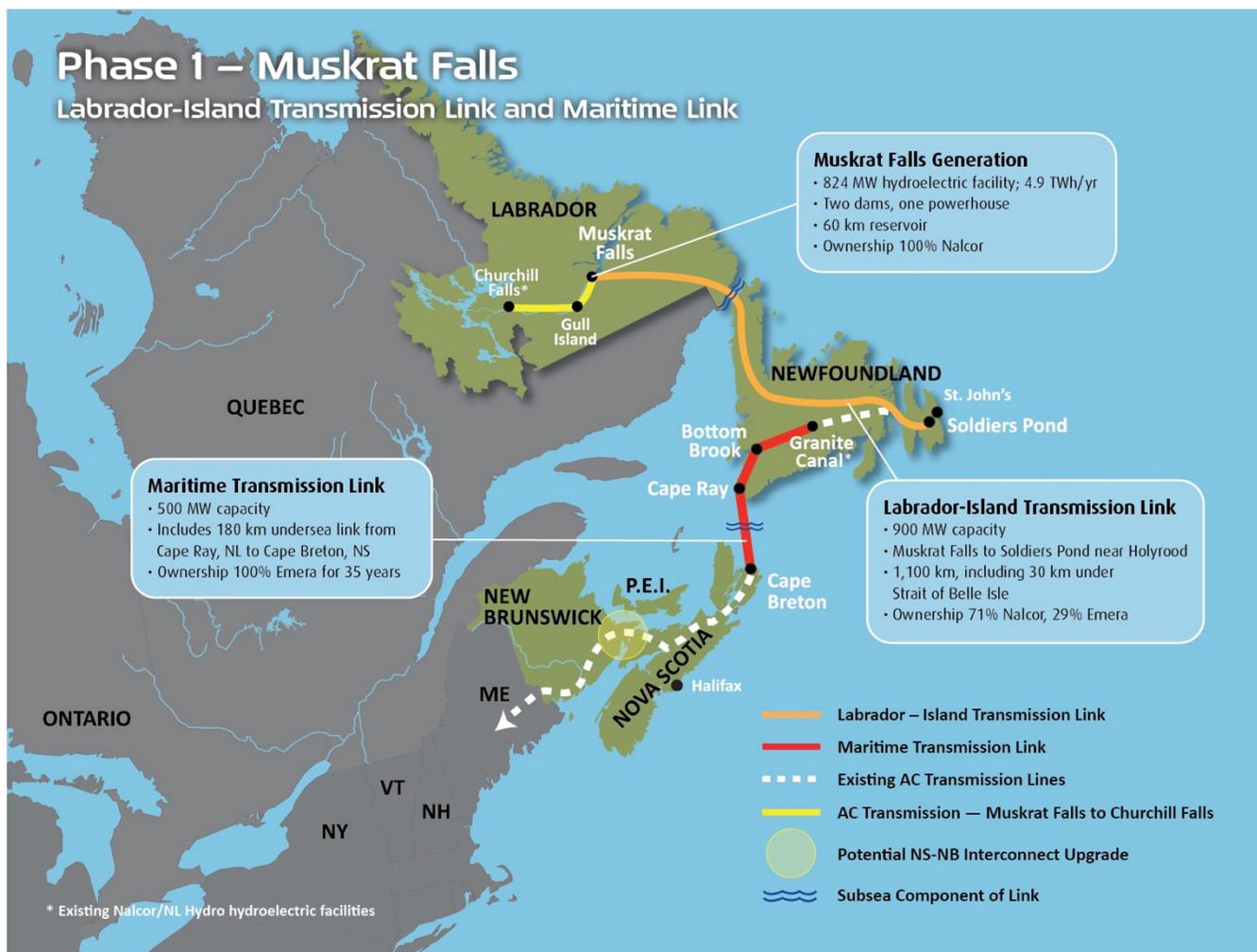


Figure 1- Location of the Muskrat Falls hydroelectric project (from Massell, 2016)

Appendix B

| In Billions | ML | MFP, LTA, LIL | TOTAL |
|---------------------|----------------|--------------------------|-----------------|
| Construction Costs | \$ 1.60 | \$ 10.10 | \$ 11.70 |
| IDC*/AFUDC** | 0.15 | 1.80 | 1.95 |
| Other | - | 0.80 | 0.80 |
| TOTAL | \$ 1.75 | \$ 12.70 | \$ 14.45 |
| Percentage of Total | 12.1% | 87.9% | 100.0% |

*IDC: Interest during construction

**AFUDC: Allowance for funds used during construction

Table 1 Cost to Complete the Project and Maritime Link (“Pre-Sanction Events,” 2020, Vol. 2, p. 160).