DECISION **2024 NSUARB 143**
M11458

NOVA SCOTIA UTILITY AND REVIEW BOARD

IN THE MATTER OF THE PUBLIC UTILITIES ACT

- and -

IN THE MATTER OF AN APPLICATION by **NOVA SCOTIA POWER INCORPORATED** for approval of its **Annual Capital Expenditure Plan for 2024**

BEFORE: Richard J. Melanson, LL.B., Panel Chair
Steven M. Murphy, MBA, P.Eng., Member
Jennifer L. Nicholson, CPA, CA, Member

APPLICANT: **NOVA SCOTIA POWER INCORPORATED**
Matthew Gorman, Counsel
Blake Williams, Senior Director, Regulatory Affairs
Mollie Morris, Counsel

INTERVENORS: **CONSUMER ADVOCATE**
David J. Roberts, Counsel
Michael Murphy, Counsel

SMALL BUSINESS ADVOCATE
Melissa P. MacAdam, Counsel
Rebekah Powell, Counsel

INDUSTRIAL GROUP
Nancy G. Rubin, K.C.

EFFICIENCYONE
James R. Gogan, Counsel (not appearing)

RENEWALL ENERGY INC.
Daniel P. Roscoe, P.Eng., President (not appearing)

PROVINCE OF NOVA SCOTIA
Nova Scotia Department of Natural Resources
and Renewables
Daniel Boyle, Counsel

PORT HAWKESBURY PAPER LP (PHP)
Alexandra Gosse, Counsel

ENERGY STORAGE CANADA
Justin Rangooni (Not Appearing)
Executive Director

BOARD COUNSEL: William L. Mahody, K.C.

FINAL SUBMISSIONS: **June 6, 2024**

DECISION DATE: **August 13, 2024**

DECISION: **The Board approves the 2024 ACE Plan and provides directions to NS Power in Paragraph 215 of this Decision.**

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1.0 INTRODUCTION

[1] Each year Nova Scotia Power Inc. (NS Power) files an Annual Capital Expenditure (ACE) Plan outlining its proposed capital expenditures for the upcoming year. For NS Power, capital projects exceeding $1,000,000 must generally be approved by the Board.

[2] NS Power's 2024 ACE Plan sought approval for capital projects totaling $257.6 million. Based on the evidence presented, and after considering the submissions made by the parties participating in this proceeding, the Board determined there was sufficient justification for the proposed projects. The Board also found the proposed projects would all assist with the reliable supply of electricity. Therefore, in the interest of time, the Board issued an Order on June 10, 2024, approving the 2024 ACE Plan, with reasons to follow, reserving the right to issue a further Order, with directives, related to other issues raised in this proceeding.

[3] In addition to considering the specific projects submitted for approval in the ACE Plan, the Board has taken the opportunity presented by the annual filing to address more general issues relating to capital spending and the project approval process. In this decision, the Board has commented on the following:

- The benefits of proposed reliability and resiliency investments;
- Regulatory compliance risks and implications of the proposed projects;
- NS Power's *The Path to 2030* plan to meet mandated decarbonization targets;
- An analysis of NS Power's vegetation management program;
- Project scoping and management of NS Power's Project Delivery Model;
- The Mersey Hydro redevelopment plan;
- Project cost minimization; and,
- Project contingencies and contingency guidelines.

[4] In addition, the Board directs NS Power to take certain actions as outlined in Paragraph 215 of this decision.

2.0 ANALYSIS AND FINDINGS

[5] Each year when NS Power files its ACE Plan application, the Board takes the opportunity to explore issues related to the activities the Utility proposes and the way spending is budgeted and justified. The Board identifies these issues early in the proceeding and seeks comments from the parties on the issues list before it is finalized.

[6] NS Power is facing a major challenge in meeting legislated decarbonization goals by 2030, with associated cost pressures, while delivering an essential service that is affordable to ratepayers. As well, climate change is impacting the NS Power grid, raising concerns about its reliability and resilience. The ACE Plan process provides the Board and stakeholders with an opportunity to assess whether proposed capital spending aligns with the decarbonization goals while providing a safe and reliable service in a cost-effective manner.

[7] In this decision, the Board will first consider the 2024 ACE Plan application, and then address the issues which emerged as important throughout the process.

2.1 Content of the 2024 ACE Plan

[8] NS Power's 2024 ACE Plan application provides a comprehensive overview of its capital expenditure program. It includes the following:

- A description of capital projects for which NS Power is seeking approval;
- Details about routine capital expenditures requiring Board approval;
- A list of capital projects to be submitted for approval later;
- Lists of capital items not requiring Board approval; and
- Responses to Board directives from prior ACE Plan proceedings.

[9] NS Power forecasts total capital spending of $433.9 million during 2024. This amount is for individual capital items, including capital items under $1 million and Point Aconi items which currently do not require Board approval; routine capital expenditures;

carryover spending from previous years; and items that will be filed later for approval. NS Power stated that its 2024 capital investments “focus on maintaining and improving existing system performance, as well as enabling Nova Scotia to achieve a lower carbon future… .”

[10] NS Power requested Board approval for capital spending of $257.6 million. This amount includes 27 individual capital projects totaling $104.9 million. NS Power plans to spend $50.9 million on these projects in 2024, and an additional $54.1 million in 2025, and beyond. NS Power also requested Board approval for $152.7 million for routine capital expenditures in 2024.

[11] The 27 individual projects NS Power asked the Board to approve include 21 projects, each with an estimated cost between $1 million and $5 million, and six projects with cost estimates, each exceeding $5 million. The number of individual projects is greater than in the 2023 ACE Plan application.

[12] NS Power provided a detailed description, justification, and cost support for each of these capital work order applications. NS Power also provided substantial additional information in its responses to Information Requests (IRs) submitted by Intervenors and the Board.

[13] The Board notes that during the proceeding, only the Consumer Advocate (CA) raised concerns about Board approval of any capital projects in NS Power’s 2024 ACE Plan. Specifically, John Wilson, Vice-President of Grid Strategies, LLC, who was retained by the CA, identified concerns with the Wreck Cove Tailrace Rock Bolting Phase 2 Project, the Lingan Wheeled Dozer purchase, the budget estimated for the Enterprise Resource Planning (ERP) Upgrade Project, and the L6038 Realignment that will move

transmission assets to newly acquired land. The CA also raised concerns about the investment in sustaining capital for the Mersey Hydro System. However, the CA, the Small Business Advocate (SBA), the Industrial Group, Energy Storage Canada, Efficiency One (EOne) and the Department of Natural Resources and Renewables (NRR) made submissions and examined several issues about NS Power's capital spending that are discussed in this decision.

[14] The Board finds that the capital projects listed in Schedule A of this decision are necessary. Further, the Board is satisfied that the plan is prudent and that the spending has been justified in accordance with the Board-approved Capital Expenditure Justification Criteria (CEJC). The Board approves the projects and capital expenditures set out in Schedule A. Should any of them be cancelled, or deferred beyond 2024, NS Power must resubmit them for Board approval.

2.1.1 Discussion of Specific Projects

[15] Mr. Wilson has extensive experience in most aspects of electricity utility regulation and has previously filed evidence with the Board in over twenty matters. He was qualified as an expert in this proceeding. Mr. Wilson filed a report dated February 23, 2024.

[16] Mr. Wilson commented on four of the 27 individual projects for which NS Power sought approval in this application: the Wreck Cove Tailrace Tunnel Rock Bolting Phase 2, the L6038 Realignment Project, the Enterprise Resource Planning Upgrade Project, and the proposed LIN 824 Wheeled Dozer Replacement purchase. Michael Goggin, Vice President of Grid Strategies, LLC, on behalf of the CA, commented on Mersey Hydro

System sustaining capital. No other intervenor filed evidence related directly to the individual projects considered in this application.

2.1.2 Wreck Cove Tailrace Rock Bolting Phase 2

[17] The Wreck Cove Tailrace Rock Bolting Project Phase 2 involves remediation and stabilization of the tailrace tunnel at the Wreck Cove Generating Station. The estimated cost of the project is $15,722,670. Wreck Cove is NS Power's largest hydro generating station producing approximately 330 GWh of energy each year. It is an integral part of NS Power's generation fleet providing dispatchable peaking capacity and operating reserve. Wreck Cove can also regulate wind and load fluctuations.

[18] The purpose of the tailrace tunnel is to pass water from the generating station to the Atlantic Ocean. The generating station cannot operate without a functioning tailrace tunnel. The tailrace tunnel is 1,706 meters long (5,600 feet) and was constructed from 1975 to 1978. It was built through rock by using drill and blast construction. The tailrace tunnel is largely unsupported. Localized areas of the tunnel are supported by rock bolts and shotcrete installed over time in response to rockfalls. A significant rockfall requiring this type of remediation took place in 2015.

[19] NS Power indicated other areas of the tailrace tunnel have experienced deterioration. In response, a phased approach for tunnel remediation was developed. Phase 1 was approved by the Board in the 2018 ACE Plan. This project remediated 200 metres (656 feet) of the tailrace tunnel and extended ground support toward the outlet end of the tunnel. With the completion of Phase 2, approximately two thirds of the tailrace tunnel will have been remediated.

[20] The scope of the proposed Phase 2 remediation was informed by on-foot inspections in 2017 and 2021, along with drone and LiDAR data generated by BGC Engineering Inc., which prepared a report dated October 23, 2023. The BGC Report identified 28 rockfalls or potential rockfalls between 2017 and 2023. A major rockfall occurred at some point between 2017 and 2021. The BGC Report indicates that without remediation, further deterioration can be expected over time, primarily caused by water flow. BGC, therefore, made the following recommendation:

> 1. BGC recommends the rock fall from Station 0+985 to 1+000 be prioritized for remediation within the next 2 years from the time of this assessment. It is notable that although the progressive rate of failure has been reduced since 2021, because of the large span and height of the tunnel at this location and the high likelihood for further rock fall, NSPI should be prepared to remediate the Tunnel in the event of a large-scale failure at this location.
>
> [Exhibit N-1, p. 187]

[21] Mr. Wilson expressed three concerns about the project budget. The first concern was that it included costs that would only be incurred if they are required for project execution. He said these costs should be considered part of the contingency. Mr. Wilson was also concerned that the 15% overall contingency appeared attributable to the civil engineering work component of the project. He said this was approached differently in another Wreck Cove project involving similar work (WRC D11-2 Foundation Stabilization, involving stabilization of the Wreck Cove Penstock intake channel) with the same contingency. Based on his analysis of the 15% contingency in each project, Mr. Wilson believes NS Power's supporting justifications suggest the Foundation Stabilization Project has less civil engineering risk, yet the contingency is the same for each project. Finally, Mr. Wilson was concerned about potential cost inconsistencies between four sources in the application: the Capital Work Order figures, the contractor Quantities and Pricing Table, the RFP Evaluation PO Details, and the RFP Evaluation Discussion. Mr.

Wilson said the RFP Evaluation Discussion did not match the other three sources. He was also concerned about the inflation escalator NS Power used, as it would be reasonable to assume the contract pricing already included an inflation adjustment, given a 2023 bid and contract execution is only expected to begin in 2025.

[22] In its Rebuttal Evidence, NS Power explained that contractors' bids were in 2023 dollars only. NS Power applied a 5% escalation factor. Escalation was determined after discussions about potential inflation with contractors and a review of CPI data for the prior two years. The Company was also in negotiations to lock in an inflation escalator. NS Power also explained how the RFP Evaluation Discussion included an amount to remediate 80 metres remaining to be completed in Phase 1 of the Tailrace Remediation Project. NS Power agreed that the capital work order line items described as "provisional", identified by Mr. Wilson, could have been included in the contingency amount. The Utility said the total amount was not material and including it in the contingency would not change the amount sought for approval. NS Power further explained how the contingencies for the Foundation Stabilization Project and the Tailrace Remediation Project were derived. While acknowledging the risk profile for the Foundation Stabilization Project may be lower, NS Power maintained that the same contingency was appropriate based on the phase of the projects, an understanding of site conditions, and professional judgment. During oral testimony, Mr. Wilson remained unconvinced that NS Power had provided sufficient justification for the chosen contingency amount and the request to include an inflation escalator for contract pricing.

[23] The Board finds that Phase 2 remediation work of the Wreck Cove tailrace tunnel is required and should be done as quickly as possible to avoid unplanned outages

that can arise due to tunnel collapses. The Board is further satisfied that the costs for labour and materials submitted by NS Power are reasonable. Except for internal resources, they are primarily based on a competitive RFP process. With respect to the specific issues raised by Mr. Wilson, the Board is satisfied NS Power's explanation about the additional scope item in the RFP Evaluation Discussion adequately addresses the cost variance when compared to the other three source documents.

[24] It could be argued that the contingency amount for the Phase 2 Tailrace Remediation Project is low, when compared with the Foundation Stabilization Project, which NS Power admits has a lower risk profile. It could also be argued it is too high, given that Phase 1 only carried a 10% contingency, and NS Power now has on the ground experience with the work. In the end, given the much larger scope of the Phase 2 Tailrace Remediation Project, and given NS Power's experience with civil work projects at Wreck Cove, and experience with underlying uncertainties for this type of project, the Board is satisfied with NS Power's contingency analysis. The Board is further satisfied with NS Power's explanation that contract pricing is based on 2023 dollars. A 5% inflation escalation is not unreasonable. Accordingly, the Board approves the Wreck Cove Tailrace Rock Bolting Project Phase 2 as filed.

2.1.3 L6038 Realignment Project

[25] L6038 is a 5.5 km 138kV transmission line. It connects the substation at 129H Kearney Lake Road to the one at 103H Lakeside. The project is to remove NS Power assets from previously leased land as part of a land exchange agreement approved by the Board in Matter M10897. A steel lattice structure will be demolished. Two new wood

poles will be installed to realign the transmission line's approach to the 129H Kearney Lake Road substation. NS Power's infrastructure must be removed by the end of 2024.

[26] The total project cost is $1,032,911. NS Power has applied a 15% contingency to the labour, materials, contracts, and meals component costs of the project. The proposed contingency is $115,242. This project must be done to comply with the terms of the land exchange and the $768,279 cost for the previously listed items is reasonable. Mr. Wilson's concern is with the 15% contingency. While consistent with the other five transmission line projects, Mr. Wilson was not satisfied with the explanation offered for the contingency amount on this project. In his view, NS Power appeared to be saying that the project was both routine and unprecedented at the same time.

[27] NS Power's Rebuttal Evidence indicated that most of the work for this project is routine. The one component that is not routine for transmission line work is the demolition of the steel lattice work. In his oral testimony, Mr. Wilson pointed out that the lattice demolition work cost is shown as $32,350. He suggested that this is the only item NS Power uses to justify a 15% contingency instead of what he considers to be a more appropriate 10% contingency for routine work. He suggested that this means roughly $40,000 of the contingency is associated with an item that has an estimated cost of $32,350.

[28] In its Rebuttal Evidence and final submissions, NS Power pointed to Note 3 accompanying the Capital Project Detailed Estimate:

> Note 3: Contingency is determined using a combination of internal subject matter expert judgment and the non-binding contingency guidelines. Consistent with the maturity checklist this project is being filed as a Class 3 Estimate with a contingency value appropriate to that range to account for risks associated with additional overtime work that may be required to complete the project within the available outage window.
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> [Exhibit N-1, p. 479]

[29] NS Power submitted that the additional 5% was meant to capture more than the risk associated with the steel lattice demolition work itself. If the demolition work encounters delays, it could drive up costs in other areas. As a transmission outage is required, delays could mean changes to the outage schedule, thus delaying project execution.

[30] The Board notes that except for the steel lattice demolition, the L6038 Realignment Project involves fewer structures than other transmission line projects with a 15% contingency. Mr. Wilson raises some valid concerns about the rationale for the additional 5% contingency as compared to other Routines. That said, the Board agrees the contingency is meant to cover more than the actual cost of demolition. An additional 5% increases the contingency amount by $38,414. If the steel lattice demolition cannot be completed within the anticipated window, project delays could well eat into a significant portion of this amount. The Board further notes that if the contingency is set at 10%, the total project cost would fall below the $1 million threshold where Board approval is required. The Board has, therefore, decided to allow the contingency amount and approve the L6038 Realignment Project costs as filed.

2.1.4 Enterprise Resource Planning (ERP) Upgrade

[31] NS Power's ERP system combines customer management, human resources, business intelligence, financial management, and supply chain capabilities through a suite of computer applications. This project involves upgrading the ERP computer hardware and software for on-premises applications, databases, and operating systems. The upgrades are required to maintain compliance with PowerPlan and Oracle support. The updates will have the latest security patches against cybersecurity

vulnerabilities. The project will also create new functionality. The estimated cost of this project is $6,198,799.

[32] In his report, Mr. Wilson expressed concerns that the procurement for this project was sole-sourced. While acknowledging this is not entirely unusual for existing computer systems, he said that where the total cost of ownership is $42.8 million, and only 14% is attributable to the capital cost component, there might be an opportunity for future operational savings and gains if other systems were explored. Mr. Wilson was also concerned that the project risk registers only addressed the capital costs. He commented on the contingency justification and on what he considered to be a contingency on a contingency in relation to an estimate from Maximus, a third-party support service provider. Mr. Wilson said it appeared Maximus already had contingency built into its estimate.

[33] In its Rebuttal Evidence, NS Power reiterated that the upgrades are to the existing ERP system. That system requires third-party support. Maximus has been providing these Application Managed Services for all applications, except PowerPlan, since July 2022, after outbidding the incumbent supplier through an RFP process. Maximus' bid was significantly lower. The two other suppliers NS Power approached during the 2022 RFP process declined to bid. With respect to PowerPlan, OnX was the successful bidder in 2022. NS Power said in these circumstances it was in the best interests of customers to use the existing third-party service providers. NS Power further explained that the detailed estimates from OnX and Maximus forming the basis of the approval request do not have contingency. Mr. Wilson did not fundamentally change his opinion and recommendation based on this information.

[34] The Board accepts NS Power's position that where existing systems are being upgraded, and where NS Power has recently gone through a competitive process to obtain the lowest cost options for two third-party service providers, it makes sense not to delay this project and revisit potential supplier sources at this stage. The Board is also satisfied with NS Power's explanations about how the contingency figure was derived. Accordingly, the Board approves this project as filed.

2.1.5 LIN 824 Wheeled Dozer Replacement

[35] NS Power currently uses a 1987 824 Wheeled Dozer to manage the coal pile used at the Lingan Generating Station. This dozer has reached the end of its useful life and NS Power wants to replace it with a D8 Track Dozer. NS Power explained that dozer components have failed multiple times in the last five years. More frequent failures are expected with the aging dozer. When this occurs, a replacement dozer must be rented for as long as six weeks while repairs are made. With old equipment, repairs take longer, and there is a longer lead time to find parts. A D8 Track Dozer has more functionality, as it has a ripper that can break up packed coal. This eliminates the need to rent an excavator. A D8 Track Dozer also has more pushing capacity. The proposed replacement dozer is forecast to cost $1,607,862. NS Power assumes the new dozer will be sold in six years, after its coal plants are retired, for a salvage value of $750,000.

[36] The Board agrees with NS Power's position that refurbishing the dozer is not a viable option and that a replacement dozer is needed. The issue raised in the IRs and in Mr. Wilson's evidence is whether NS Power should move forward with purchasing a new D8 Track Dozer or seek to buy a used one at auction.

[37] In the Economic Analysis Model (EAM) for this project, NS Power had compared the cost of purchasing a new dozer with leasing or renting a new dozer. On a cumulative net present value basis, the purchase option was clearly superior (by almost $1 million) using the $750,000 salvage value in 2030. NS Power had not considered purchasing a used dozer.

[38] In his report, Mr. Wilson questioned the estimated salvage value, based on the assumption that many coal handling facilities would be closing by 2030, depressing the market for this type of equipment. Mr. Wilson also pointed out that, in response to NSUARB IR-122(f)(i), NS Power said used dozers are currently selling at auction for “in excess of $400,000." As the figure of $455,793 was used for the initial annual rent in the lease option in the EAM, Mr. Wilson said this indicated a used dozer could be purchased for approximately the same cost as leasing a new one for one year.

[39] In its response to NSUARB IR-122(d), NS Power said attempting to buy a used dozer at auction was risky as it might not be the successful buyer, which would create further delays and costs. NS Power also said a purchase at auction created risk about the condition of the dozer. Also, NS Power would have no warranty protection if it purchased a used dozer at auction.

[40] Mr. Wilson was not convinced that NS Power’s arguments against buying a used dozer were valid. He said NS Power would have known for many years the 824 Wheeled Dozer was at the end of its useful life. It could have participated in auctions earlier, and could still rent a dozer now, if required, while seeking out dozer auctions. On the issue of the condition of a used dozer, Mr. Wilson said a reasonable buyer would not gamble on a dozer in an unknown condition. With respect to the risk of repairs and

maintenance and no warranty, Mr. Wilson pointed out that the 824 Wheeled Dozer has averaged annual repair costs of $38,000. He said a newer dozer should have less downtime, and therefore, a warranty would have limited value in an alternative analysis for a used dozer.

[41] In his report, Mr. Wilson recommended that the Board direct NS Power to reconsider the purchase of a used dozer and perhaps get a third-party opinion. He also suggested that, if time is of the essence, an alternative analysis could include the cost of renting a dozer until a suitable replacement is found. He further said any alternative economic analysis should have a lower salvage value than $750,000.

[42] In its Rebuttal Evidence, NS Power said there was no means of accessing the maintenance records, history and completing a condition assessment before an auction purchase. The Utility, therefore, maintained its position about the risk of buying a used dozer, that might not be in suitable condition at auction. With no warranty, this could create significant risks that major overhauls would be needed. NS Power reiterated the need for certainty about the delivery time. This could lead to overpaying at auction to make sure a bid was successful or, potentially months of delay, and associated rental costs.

[43] NS Power prepared a new EAM adding the purchase of a used dozer in the comparison. This EAM indicates that purchasing a used dozer is slightly more expensive, by $48,602, on a cumulative net present value basis, than purchasing a new dozer. This is primarily because, while the purchase cost is lower (NS Power assumed a purchase price of $800,000), NS Power also assumed higher operating costs associated with repairs and leasing, and higher refurbishment costs in 2027 (when the Utility says both a

new and used dozer would likely require refurbishment), along with a lower resale value. NS Power said the $750,000 resale value is reasonable for a six-year-old dozer, factoring in inflation to current auction prices. NS Power attributed a $400,000 resale value for a used dozer.

[44] The Net Present Value (NPV) variance between the used and new dozer is small. In response to Board questions, NS Power acknowledged that the sensitivity analysis showed that changes in certain assumptions could flip the result so that the used dozer option would be more economic.

[45] In his oral evidence, Mr. Wilson said that after seeing the new EAM it was now his opinion that the Board should not approve the purchase of a new dozer. In his view, the purchase of a used dozer was likely the lower cost solution. He said that it made no sense that potential buyers could not assess the condition of equipment purchased at auction. That would essentially mean that there would be no market for expensive used equipment sold at auction. He reiterated his opinion about the delays that might arise in finding a dozer and that the financial risks associated with a lack of warranty were not substantial enough to overcome the lower cost associated with buying a used dozer.

[46] There are significant issues with NS Power's position that there are no means of ascertaining the condition of a used dozer. It calls into question why anyone would buy used equipment at a significant price. It might call into question how NS Power expects to obtain $750,000 (or $400,000, for that matter) for a used dozer at auction in six years. That said, the Board can accept that buying any piece of equipment that has been used comes with greater risks than buying it new. Therefore, there is a reasonable prospect there will be higher repair and maintenance costs associated with a used vehicle.

[47] The Board has some issues with the revised EAM in the NS Power Rebuttal Evidence. For example, while NS Power said used dozers sold for more than $400,000 at auction, it used $800,000 as the purchase price for a used dozer in the EAM. Presumably this is based on the target age. Also, the operating costs for a newer used dozer seem to be higher than the historical average for the 37-year-old 824 Wheeled Dozer.

[48] The assumptions about original costs and operating costs always require an element of judgment. A significant change to any one of the underlying assumptions could result in the EAM indicating the purchase of a used dozer is the preferred option. The sensitivity analysis in the NS Power Rebuttal Evidence shows a +30% variance to the estimated total capital investment would lead to the used dozer being the preferred option, albeit by only approximately $75,000. In the final analysis, where the cumulative NPVs in the EAMs between the purchase of a new or used dozer are relatively close, the Board is prepared to authorize the less risky proposition. Accordingly, the Board approves the request for the new D8 Track Dozer, as filed. Routine Capital Expenditures

[49] Routine capital expenditures are recurring expenses to sustain equipment, and to accommodate system and customer growth. NS Power requested approval for its Routine Capital Program in the amount of $152.7 million, exclusive of Point Aconi Routine spending of $243,134, which currently does not require Board approval.

[50] The proposed Routines budget in 2024 is approximately 25.4% higher than the 2023 ACE Plan budget and 6.5% higher than actual spending in 2023. The significant increased spending on Routines in 2024 is primarily due to the New Customer and Distribution Upgrades & Replacements Routines.

[51] Mr. Wilson noted that NS Power made an error by overestimating the New Customer Upgrades Routine D004 by $861,160. In its Reply Evidence, NS Power agreed to correct this estimate from $9,424,783 to $8,563,623. This adjustment reduces the total value of the budget for routines to $151.9 million.

[52] Mr. Wilson said that in NS Power's 2022 General Rate Application the Board approved a storm rider for the 2023-2025 period which is based on a five-year average cost for level 1 to 4 storms. Mr. Wilson supported the Provincial Storm routine D008 methodology to forecast storm restoration costs using a five-year average, plus inflation, and excluding extreme event days. Further, he recommended that the Board approve the D008 storm routine method for 2024 and 2025.

[53] Mr. Wilson recommended two areas of improvement for forecasting the distribution and transmission routines. He recommended that NS Power acquire more relevant data and build better forecasts. Mr. Wilson suggested that NS Power needs to compile better historical and forecast data to get a breakdown of costs. He suggested that NS Power might improve its forecasting by creating an additional distribution routine or subroutine to distinguish new customer growth, electrification, and other factors. Mr. Wilson also proposed that NS Power use this new data in its forecasting for planning purposes at the substation and circuit level as well as for budgeting and that these methods be linked to those used in the Load Forecast Report.

[54] In its Rebuttal Evidence, NS Power stated that it cannot obtain the data needed to provide the breakdown recommended by Mr. Wilson. NS Power indicated it will assess how this data can be obtained, but noted that the level of granularity recommended by Mr. Wilson will require the dedication of more resources.

[55] Under the New Residential Customers Routine (D061), there was significant overspending between the 2023 budgeted and actual cost amounts. NS Power stated that this increase was largely driven by a higher quantity of new customers requiring connections than originally budgeted. Given that the calculation for the budget amount of this routine incorporates a five-year average of historical costs, adjusted for inflation and administrative overhead, the higher actual costs in 2023 drove an increased budget amount in the 2024 ACE Plan. In response to Board IR-79(c), NS Power provided a detailed comparison of 2023 actuals to the 2024 ACE Plan budget for the residential and commercial new customer routines, D061 and D062, respectively.

[56] During the hearing, Board Counsel questioned NS Power about the cause of the increase to the line items Royalty/Easements under these routines. NS Power explained that the increase is partially due to higher volumes of work but could not provide more specific examples of Royalty/Easement expenses. NS Power agreed to provide a better explanation for the increase of Royalty/Easement expense in D061 and D062 by way of Undertaking U-4.

[57] In NS Power's Undertaking U-4, it confirmed that there are no Royalty costs associated with either new customer routine. However, the Easement costs are incurred as required to complete new customer work. The values were calculated using a three-year average plus inflation for D061, and a five-year average plus inflation for D062.

[58] During the hearing, Board Counsel questioned NS Power on the difference in its projected new customers compared to the projections in NS Power's 2023 Load Forecast Report under matter M11108. NS Power offered to examine the cause of the differences in the projections in Undertaking U-5.

[59] NS Power's Undertaking U-5 indicates that the Load Forecast Report bases projections of housing completions from the Conference Board of Canada, which may correspond with the estimates for D061 New Residential Customers. However, the D061 routine considers a multi-unit building as a single customer, but within the Load Forecast each unit of that building represents a customer. Additionally, customer renovations or additions are counted in D061 but not captured in the housing completions. NS Power acknowledged that both sources are attempting to estimate changes to residential units, but the approach applied in Routine D061 is in keeping with the underlying methodology used to estimate the budget for associated work. NS Power doesn't have access to data that provides a comparative estimate for D062, New Commercial Customers.

[60] Within the Distribution Upgrades & Replacements routines, the significant budget increases as compared to the 2023 ACE Plan were predominately from Routines D008 (Provincial Storm), D005 (Unplanned Replace Deteriorated Equipment) and D055 (Planned Replacements of Deteriorated Equipment). This issue was raised in the IR process and discussed during the hearing.

[61] NS Power was questioned during the hearing about its response to NSUARB IR-61 that requested a table with current and historical costs, excluding extreme events, for Provincial Storm Routine D008. NS Power's response to NSUARB IR-61 presented different values for the historical expenditures. NS Power acknowledged that in the previous tables Administrative Overhead had been included, whereas in the response to NSUARB IR-61 it was separated. While the presentation of the information is different, NS Power confirmed that the methodology hasn't been changed. During the hearing, the

Board requested that NS Power select a single presentation format in future ACE Plan applications for consistency.

2.1.6 Findings

[62] The Board agrees with NS Power's method of estimating the Provincial Storm Routine D008, which was supported by the CA. NS Power is directed to apply the current methodology to forecast storm restoration costs until the storm rider calculation is revisited.

[63] The Board considers that the improvements recommended by Mr. Wilson to collect more relevant data and create a better forecast would lead to improved forecasting for the distribution and transmission routine budget forecasting. However, the Board agrees that this process will require a considerable undertaking on NS Power's part to gather, measure and test the methodology, which may not provide a significant improvement from the current process used to forecast these routines. At this time, the Board will not direct these changes to NS Power's forecasting methods. Nonetheless, if NS Power's forecast continues to vary significantly when compared to actual spending for these routines, the Board will reconsider this recommendation. NS Power is encouraged to continue assessing its budgeting practice for these routines to improve the accuracy of its forecasts.

[64] The Board agrees with Mr. Wilson that the budget for Routine D004 New Customer Upgrades should be $8,563,623. This change was not reflected in the total routine budget previously approved in the Board's Order. The Board approves NS Power's 2024 Routine Capital Expenditures in the amount of $151,858,720 and has revised this approval in the Order accompanying this Decision.

2.2 Vegetation Management

[65] NS Power recognizes the importance of vegetation management and has increased its budget to $45 million in the current ACE Plan from $32 million in 2023 and an average of $25 million annually over the last five years. The Company intends to continue spending at this level for the next several years. Vegetation management is seen as an important component of improving reliability of the NS Power system. As with other components of reliability, it has and continues to be addressed in many matters before the Board.

[66] The distribution vegetation management program is carried out under three initiatives: operating activities, capital routine D010, and new distribution rights-of-way capital projects. NS Power describes an increased level of crews working on vegetation management throughout 2023 and plans to approximately double the amount of those crews by the end of 2024. NS Power is enhancing its vegetation management by piloting the use of satellite imagery and ground-based LiDAR to develop a better understanding of vegetation conditions across the distribution system. In its M10886 – CI C0052056 – New Distribution Rights-of-Way Phase 8 decision, the Board approved this capital application but directed NS Power to provide additional information to the Board about its vegetation management program:

> … The Board believes that tree clearing will likely reduce outages and increase reliability. The Board finds that the justification for the project provided by NS Power is appropriate. Nonetheless, the Board believes an overall program analysis is required. Data is available from prior years that can be analyzed to provide insights into the program effectiveness from a reliability and cost savings perspective. The following information should be included in the analysis:
>
> 1) Analysis and financial justification for not hiring full time NS Power staff for vegetation management considering this will be an ongoing program.
>
> 2) Updated present value analysis showing actuals and updated forecasts.
>
> 3) A reliability analysis using feeder outage data from 2016 through current.

> 4) The 30% savings impact due to cost sharing of tree trimming with the Internet for Nova Scotia Initiative has on the program.
>
> NS Power is directed to submit the completed analysis to the Board by December 31, 2023
>
> [Exhibit N-3, p. 1]

[67] NS Power responded to this directive in a December 20, 2023, letter to the Board [Exhibit N-3]. In response to the first directive, the Company explained that hiring contractors is less expensive than hiring, training and retaining full-time vegetation management staff of sufficient skill to do the work required.

[68] In response to the second and third directives, NS Power submitted an updated version of the EAM for the Vegetation Management Program. The Company stated that achieved savings from a storm will always be an estimate, as there is no way to confirm how much additional work would have been required if the vegetation management work that was done prior to a storm was not completed. NS Power said it knows the restoration would be longer and more costly if this work was not completed but is not able to calculate actual cost savings. Due to this, it said the estimate included in the original application remains appropriate.

[69] The Company stated that based on the new inputs in the EAM, the New Distribution ROW program remains the most economic option. It said this project is not driven by economics, and even if the New Distribution ROW program was not the most economic option, the decision to proceed with this program remains unchanged. The Company said the driver for this project is reliability and the value of this increased reliability from the expanded ROW (20 feet compared to 10 feet) is not something that can be quantified and/or calculated as part of an EAM. Nevertheless, NS Power stated that the new standard of 20 feet of clearance from power lines exceeds the industry

standard of 10 feet but is still not sufficient to fully mitigate the risk of tree contacts during an extreme weather event such as Hurricanes Fiona or Dorian.

[70] The Company said the level of clearance needed has been well proven through the 69kV Transmission ROW widening program which is generally achieving clearance of 50 feet. This has proven very effective, in both Hurricanes Dorian and Fiona at avoiding tree fall-ins during extreme events. NS Power believes that this level of clearance is not achievable or practical on the Distribution system. The 69kV system widening program is being completed through forested, less densely populated areas and not along roadsides where most of the Distribution system is located.

[71] NS Power says it has a very good success rate of gaining the public's permission in extending the Distribution ROW from 10 feet to 20 feet onto private property. However, the expectation of going beyond 20 feet, to upwards of an additional 30 feet onto private property is not considered feasible. NS Power remains confident that the New Distribution ROW program is having a positive impact on reliability through avoided tree contacts and will continue to do so into the future.

[72] With regards to the fourth directive in M10886, NS Power stated that there are savings that can be attained in cost sharing of tree trimming with the Internet for Nova Scotia initiative. However, these savings can only be achieved in instances where the timelines associated with the Internet for Nova Scotia initiative allow for NS Power's vegetation management specifications to be completed at the same time as the joint-use requirements and this is often not the case.

[73] NS Power is currently working with the Centre for Energy Advancement through Technological Innovation (CEATI) on its vegetation management program.

Additionally, NS Power is working with the other members of the CEATI group, and other member utilities, to benchmark its vegetation management program. NS Power expects there will be feedback based on the data provided by member utilities and there may be recommendations which will further enhance NS Power's program.

2.2.1 Findings

[74] Vegetation management is a major component of any reliability program. It may also impact on resiliency. The Board appreciates NS Power's current difficulty in demonstrating any cost savings associated with its vegetation management program. However, as with any program, there may be alternatives based, for example, on methods and locations, that are more effective than others. In order to show that NS Power's vegetation practices are being optimized, metrics are very useful. The issue of reliability metrics is discussed later in this decision.

[75] The data provided by the CEATI benchmarking exercise may also be helpful in assessing the vegetation management program. The Board directs NS Power to file the CEATI report upon receipt.

2.3 Reliability Investments and Resilience Benefits of Proposed Investments

[76] NS Power's investments in the reliability and resilience of the system have been ongoing issues and continue to be discussed and reviewed by the Board and stakeholders in other proceedings. These include NS Power's annual Performance Standards Reports, Storm Outage Analysis Reports, annual Emergency Services Restoration Plan and Drill Reports, the Routine D008 Provincial Storm ATO, Deferral of Hurricane Fiona OM&G Costs, capital approval applications and the recent Property and Asset Review proceeding.

[77] Questions from the Board and Intervenors remain as to whether NS Power is investing enough in the right things to fundamentally improve reliability and the ability of the system to withstand more severe weather events. NRR commented on the need for metrics to assess the prudence of storm hardening investments.

> 12. NRR has, in its recent closing submissions in M11169 and M11411, commented on the need for the Board to have some metric to assess the prudence of storm hardening investments in considering storm cost recovery applications. NRR submits that its argument in these previous cases is equally applicable in this proceeding with respect to NS Power's reliability-related capital investments generally. Specifically, clear metrics would be useful for assessing the prudence of such investments and reviewing NS Power's own assessments of one investment's prudence as against rejected alternatives.
>
> [NRR Closing Submission, p. 4]

2.3.1 Third Party Review of Reliability Investments

[78] Mr. Wilson recommended a third-party review of NS Power's reliability investments and programs. He recommended such a review should be commissioned and provided to the Board no later than the 2025 ACE Plan. The Industrial Group and NRR agreed that this is a reasonable step. Mr. Wilson suggested that NS Power should:

> 4. Seek a third-party review of its reliability investments and programs, to be reported back to the Board no later than the 2025 ACE Plan... . This review could consider whether NS Power should, for example:
>
> a. Use its WAM system to increase productivity and route optimization of its vegetation management contractors; ...and
>
> b. Modify its vegetation management programs to allow for voluntary permission from property owners to extend the right-of-way further than 20 feet to clear higher-risk vegetation.
>
> [Exhibit N-15, p. 8]

[79] Mr. Wilson cited NS Power's Performance Standards Report and the Storm Rider application as the most recent illustration of the fact that NS Power continues to struggle to meet its reliability obligations. He stated that "an independent review of Nova Scotia Power's programs on reliability would be a wise and timely investment."

[80] Although the Industrial Group agrees with NS Power that it should not undertake work with no value, it supports a third-party review as well.

> The Industrial Group supports the recommended third-party holistic review of NSPI's reliability investments, vegetation management, infrastructure hardening and system planning, including recommendations on measures and strategies, within the current climate context and changing energy demand. It is recommended that Terms of Reference for such a project be developed collaboratively and that consideration of the Report be addressed in the next ACE plan application or in a separate proceeding.
>
> The Industrial Group also notes NSPI's agreement during the hearing to file the CEATI report on receipt and requests this be reflected in the Board's directions in this matter.
>
> [Industrial Group Closing Submission, pp. 3-4]

[81] NRR also agrees with Mr. Wilson that there is merit to a third-party review of NS Power's reliability processes.

> 13. A third-party review, tasked in its terms of reference with considering how the Board can best assess the relative prudence of reliability-focused capital investments, would be beneficial. Some benefit can be derived from such review even if it does nothing more than inventory the reliability strategies and asset management principles Mr. Pickles described and assess how effective these are in complementing work already undertaken to avoid outages.
>
> [NRR Closing Submission. p. 4

[82] In its Reply to Closing Submissions, page 5, NS Power disagreed:

> NS Power views additional third-party review as a duplication of effort and an unnecessary additional cost to customers. Instead, these resources are better allocated to forward-looking projects directed at improving reliability. Such work has already been undertaken through NS Power's current processes within the Enterprise Asset Management team and the newly formed Reliability team. This includes recent work with the Clean Energy Task force, resulting in a report filed with the Provincial government that included recommendations related to reliability. With respect to the benchmarking review of NS Power's vegetation management program that is currently under way with CEATI, there may be recommendations resulting from this work. NS Power has committed to sharing the results of this work with the Board and Stakeholders.
>
> NS Power has also accepted several recommendations from the Board's Asset Management Consultant during the Property & Assets Evaluations (M11067) that will give the Board and stakeholders more visibility into NS Power's Asset Management Strategies. This includes submitting a Strategic Asset Management Plan annually which will further outline detail into the Company's reliability investments. To avoid duplication of effort, it would be beneficial for the Board and stakeholders to review NS Power's Strategic Asset Management Plan prior to recommending or directing any additional review of reliability investments.

2.3.1.1 Findings

[83] The Board recognizes that reliability, resilience and NS Power's performance have been and continue to be analyzed in several other NS Power proceedings. In the Board's decision for M11169, it directed NS Power to undertake several initiatives to improve its asset management activities. The Board stated: "However, the Board continues to be of the view that a third-party review of NS Power's reliability investments would not be efficient at this time. Many of the issues that would be addressed in such a review will likely be considered in these other processes and the further engagement with stakeholders that is contemplated." The Board agrees with NS Power that spending time and money on additional reviews may not be the best use of ratepayer money but agrees with Intervenors about the importance of seeing and measuring the Company's progress on these items.

2.3.2 Resilience vs. Reliability

[84] There was significant discussion at the hearing about the difference between resilience and reliability and how they work together. The SBA, its consultant, Melissa Whitten, Managing Consultant of Daymark Energy Advisors, and NRR were particularly focused on this topic. Its Closing Submission states:

> … Having clear definitions of resiliency and reliability ensures that all parties understand the basis upon which projects are being put forward and the results that can be expected and measured against.
>
> [SBA Closing Submission, p. 4]

[85] During cross examination by the SBA, Paul Dandurand, Director of Reliability for NS Power, defined resilience as follows:

> **A.** (Dandurand) … Resilience is about, you know, preparing for an event, responding to the event, and the investments that are made in the power system for it to be more resilient and able to withstand, but also, bounce back from significant weather events, in particular.

> So it is about more than just the investments themselves. It's also about process and the work that is undertaking storm response, for example. So all of the work that Nova Scotia Power does in advance of a storm landing in the province, the -- all of the prestaging of our crews that we do, the response that we do in opening our emergency operations centre and the response activities that we perform throughout weather events, all of that is also part of the resilience activities that the company undertakes.
>
> [Transcript, p. 71]

[86] Mr. Dandurand stated that improving resilience also improves reliability. He said that investments in both the current ACE Plan and those in the longer-term plan will improve resilience and inherently improve reliability metrics such as SAIDI and SAIFI.

[87] NS Power considers “system resilience” as its ability to recover from an adverse event or situation that impacts the transmission and distribution system. The Company says system resilience and reliability go hand-in-hand, as an increase in storm hardening activities makes the power system better able to withstand adverse events, and ultimately has a positive impact on reliability. Improving resilience of the power system and continuous improvement in outage response processes also enables quicker restoration during a weather event, which also positively impacts reliability.

[88] NS Power stated that investments such as moving distribution lines from forested areas to the roadside, vegetation management, installing higher class poles, stronger insulators, and smart reclosers are all examples of storm hardening activities that have a positive impact on both resiliency of the power system and reliability. NS Power said it can track the benefits of these initiatives through monitoring the asset condition rating and overall asset risk profiles.

[89] In NS Power’s Rebuttal Evidence, it stated:

> The Edison Electric Institute (EEI) outlines several definitions of resiliency that it considers useful.
>
> For example, the Federal Energy Regulatory Commission (FERC) defines resiliency as 'the ability to withstand and reduce the magnitude and / or duration of disruptive events,

> which includes the capability to anticipate, absorb, adapt to, and / or rapidly recover from such an event".
>
> [Exhibit N-16, p.42]

The EEI also makes reference to the National Academy of Science's definition of resilience, which states that it "is the ability to prepare and plan for, absorb, respond, recover from, and more successfully adapt to adverse events." Later, NS Power explained that system resilience affects reliability and discussed that resiliency supports quicker restoration in response to an outage.

[90] The Board has reviewed these definitions and considers them to be from independent, industry-respected sources, which are reasonable. The Board agrees that system resilience and reliability are related, and that any measures to improve one are expected to improve the other.

[91] In its Closing Submission, the SBA appears to take issue with the lack of transparency around NS Power's long-term resiliency plan. The SBA stated that:

> While it is positive that NSPI has a plan, without understanding exactly what, where or how the projects are to be carried out, there is little ability to know if the plan is being followed. As a result, stakeholders and ratepayers are limited in their ability to assess whether the projects being proposed align with a longer-term plan; how the results reflect whether the plan was completed as intended; and whether NSPI's inability to achieve its targets (as described in the annual Performance Report) is due to a failure to successfully carry out the plan, or is due to issues beyond NSPI' s control.
>
> [SBA Closing Submission, p. 2]

[92] The SBA pointed to NS Power's Path to 2030 plan as an example of a helpful long-term plan. The SBA stated that a long-term reliability/resiliency plan could address issues such as "resiliency and reliability; the effectiveness of measures designed to improve SAIDI and SAIFI results; and other metrics designed to show how much the system can be relied upon in all types of circumstances." The SBA stated:

> …the SBA submits that it would be a great benefit to all stakeholders, both for this ACE Plan and other matters before the Board, to have a written plan from NSPI outlining its

> short to long term projects and undertakings with respect to improving reliability, resiliency and storm-hardening.
>
> [SBA Closing Submission, p. 3]

[93] NS Power says its long-term plans to improve resiliency and reliability are already included within the Company's ACE Plans and Annual Performance Standards Reporting. Within these filings, the forecast investments for Transmission and Distribution are outlined, and a significant portion of these investments are aimed at improving resilience and reliability. In addition, the Company was directed to file its Climate Change Adaptation Plan in 2025 and will be responding to directives arising from the Board's Property and Assets Review decision, both of which will provide more visibility into the Company's long-term reliability and resiliency planning.

[94] The issue of weighing the cost of improving the resilience of the system compared to the benefits was recently addressed by the Board in M11169:

> [39] This highlights the need for open and frank dialogue between NS Power, its customers and government about the level of performance that is desired and how much ratepayers are willing to pay for it. This is not to suggest that investments in resilient systems cannot be cost effective. Many likely are. But rate impacts must also be considered. A significant investment in system resiliency may cause immediate rate increases, whereas a business-as-usual option that may cost more in the longer term could result in more gradual, even if ultimately higher, rate increases.
>
> [40] Additionally, no system can be built to withstand every possible threat. This is an unrealistic expectation. Resilience should be understood more as a question of degree. Investments in resiliency will not necessarily eliminate damage from disruptive events but could help to reduce damage and could also facilitate the recovery from a disrupted state to normal operations.
>
> [2024 NSUARB 115]

2.3.2.1 Findings

[95] The Board agrees with NS Power that the ACE Plan process is the appropriate forum to provide additional information that may be helpful to the Board and Stakeholders in further understanding NS Power's plans related to resilience and reliability.

[96] In the Board Decision for NS Power's 2022 General Rate Application, NS Power was directed to engage in a consultative process to develop a formalized climate change adaptation plan to be filed with the Board no later than 2025. In that Decision, the Board cited Hydro Quebec's 2022-2024 Climate Change Adaptation Plan. The Board notes that the purpose of this plan is to provide a detailed description of what the Utility must do in the face of the risks posed by climate change, with clear objectives and timelines. Given the length of time provided to NS Power to complete the work, the Board expects the Climate Change Adaptation Plan to be fulsome and comprehensive. The Board, therefore, expects a component of the plan will include the type of information the SBA said would be useful about short to long term projects to improve reliability, resilience and storm hardening. The Board directs NS Power to provide a status update of its progress on its Climate Change Adaptation Plan in the 2025 ACE Plan and advise what stakeholder engagement has been done to date.

[97] In the Board's Decision for M11169, NS Power's Distribution Routine ATO for the 2022 ACE Plan, which mainly dealt with costs from Hurricane Fiona, the Board directed that:

> Finally, the Board agrees with Ms. Whitten that NS Power needs to develop better metrics and analysis to evaluate the cost-effectiveness of resiliency investments. These should be capable of both quantifying the expected benefits of a resiliency investment and measuring the effectiveness of that specific intervention once it is in place. The Board directs NS Power to consider this issue and provide a report to the Board in its 2025 ACE Plan application.
>
> [Decision from M11169, p. 27, para. 64]

[98] The Board considers this direction to sufficiently address the concerns raised in this matter as well and incorporates it in this Decision.

2.3.3 Normalized SAIDI

[99] Ms. Whitten recommended that NS Power review and revise Figure 67 from the application and explain how it differs from the one provided in Matter M11169 in response to the SBA's IR-8. She also asked for a definition of Normalized SAIDI that supports NS Power's conclusion that its Normalized SAIDI is improving over time. In its Reply to Closing submission, NS Power stated:

> …the data from 2023 changes the slope of Normalized SAIDI significantly due to the outsized impact of non-wind related events during that year, like wildfires, extreme cold, significant lightning, and record-breaking floods…Normalized SAIDI in this context means SAIDI divided by the hours of gusts above 80 km/hour.

[100] The Board considers NS Power's response has sufficiently addressed Ms. Whitten's requested explanations but is concerned that one singular gust of wind over 80 km/hour could be interpreted as representing an hour of sustained wind gusts according to this definition. The Board is concerned that this would overstate the number of hours of sustained wind used in the calculation for Normalized SAIDI.

2.3.3.1 Findings

[101] In addition to concerns about whether the Normalized SAIDI overstates the frequency or severity of wind gusts over 80 km/hour, there is also the issue about how such a metric is used. A distinction can be drawn between performance standards that carry a penalty if they are not met and those used in evaluating the need for, and effectiveness of, a capital investment program. When looking at capital expenditures, there is always the question of whether the proposed work on resiliency and reliability, such as vegetation management, is having or will have a measurable impact. When one of the major effects of climate change is removed, such as wind gusts over 80 km/hour, in the case of the Normalized SAIDI, the Board has concerns about the utility of such a

metric. This is not to say that there is not a sound underpinning for the proposition that vegetation management, and other storm hardening initiatives discussed in this Decision, should have a positive impact on resilience and reliability.

[102] NS Power is directed to continue to study this issue and provide further information about potential alternatives to the way Normalized SAIDI is presented, in the 2025 ACE Plan. In conjunction with the work directed in this Decision about metrics associated with resilience, the Board further directs NS Power to consider if there are alternative metrics to assess investments to address reliability, in the context of proposed capital expenditures, and report back to the Board in the 2025 ACE Plan. The Board further welcomes information on any appropriate metrics from any participants in ACE Plan proceedings.

2.4 Director, Reliability Implementation

[103] In the Board's 2023 ACE Plan Decision [2023 NSUARB 159], NS Power was directed to provide an update in the 2024 ACE Plan on the progress of the Director, Reliability Implementation and his team. NS Power provided this update and the Board finds it informative. The Board looks forward to additional updates in the 2025 ACE Plan.

2.4.1 Reliability Initiatives, Strategies, and Programs with Electricity Canada and Others

[104] In the Board's 2023 ACE Plan Decision, NS Power was also directed to provide an update on any reliability initiatives, strategies, and programs developed through its work with Electricity Canada or any other organizations. In the 2024 ACE Plan proceeding, NS Power stated throughout its evidence and in the hearing that it continues to undertake discussion and collaboration with other utilities through a number of industry forums in Canada and the United States. Through these groups, the Company continues

to identify opportunities for improvement, when appropriate for its operating context. NS Power cautioned that comparison to electric utilities outside of Atlantic Canada would require careful consideration and may not lead to a set of comparators that provide meaningful insights. The Board looks forward to further updates on this topic in the 2025 ACE Plan.

2.5 *The Path to 2030* - Environmental and Regulatory Compliance Risks and Implications of the Proposed Projects

[105] In its 2023 ACE Plan Decision (M11017), the Board directed NS Power to file a detailed plan about how it was going to achieve legislated decarbonization goals by 2030, as follows:

> [6] … file a detailed and specific plan outlining how the Company will achieve the 2030 obligations, what specific steps are required to meet these obligations, how the proposed steps will accomplish that goal, and when these steps will be taken.

[106] On January 2, 2024, NS Power filed a detailed plan called *The Path to 2030*. The Board made it an exhibit in this proceeding. There are several decarbonization goals being advanced by the provincial and federal governments to meet certain targets by 2030. Two specific targets are enshrined in the following enactments: the provincial *Renewable Electricity Regulations* and the federal *Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations*. The foregoing legislation requires NS Power to achieve 80% of electricity sales from renewable resources and to phase-out coal generation by 2030. *The Path to 2030* provides details on how NS Power plans to achieve these legislated requirements.

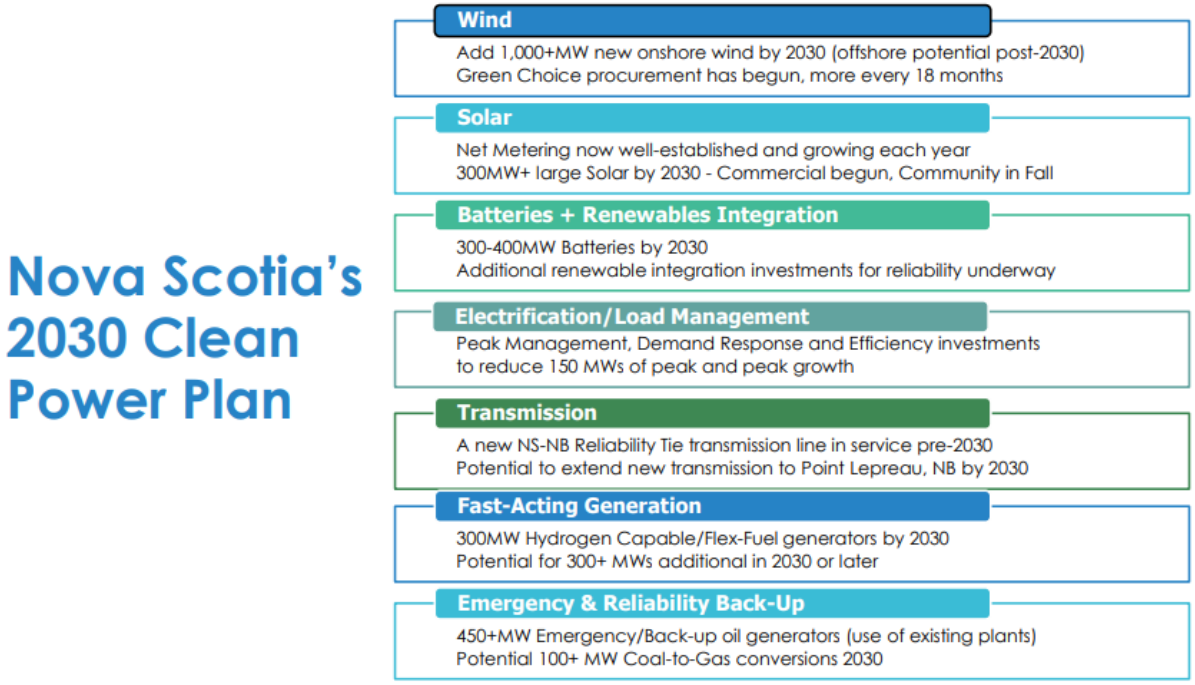
[107] Figure 1 in the Executive Summary shows the various resources NS Power anticipates will be required to meet the 2030 decarbonization requirements, along with projected times when these resources will be available:

	Nameplate Capacity (MW)	Anticipated COD (Year)
Wind & Solar Resources		
Rate Base Procurement	373	2025
Green Choice Program	350	2028
Port Hawkesbury Paper Wind	168	2025
Renewable to Retail Wind	150	2024
Community Solar	50	2025-2029
Commercial Net Metering	50	2024-2029
Energy Storage Resources		
NS Power BESS Project	150	2025-2026
Provincial Section 4D Projects	150	2026
Provincial Section 4B Projects	100	2027-2028
Fast Acting Generation Resources		
Stage 1	300	2027
Stage 2	300	2029-2030
Fuel Conversions at Existing Units		
Gas Conversion – Point Tupper 2	150	2028
HFO Operation – Lingan 1/3/4	459	2029
Total New Wind & Solar	1,141	
Total New Energy Storage	400	
Total New Fast Acting Generation	600	
Total Fuel Conversions	609	
Load Management Initiatives	150	2025-2029
Total Coal Phase Out	1,229	

[Exhibit N-2, p. 6]

[108] NS Power's response to the legislated requirements is being informed by an Integrated Resource Planning (IRP) exercise now known as the Evergreen IRP. This is a stakeholder engagement process overseen by the Board. It involves extensive modelling incorporating the latest information on system requirements, projected electricity demand, and how this projected load can be serviced with at least 80% renewables and no coal-fired generation by 2030. The latest Evergreen IRP Action Plan and Roadmap was filed with the Board in August 2023.

[109] The Nova Scotia 2030 Clean Power Plan is also a significant policy document outlining how the Province envisages the electricity transition. Figure 2 of *The Path to 2030* summarizes the key components of the provincial plan:



[Exhibit N-2, p. 11]

[110] NS Power said there was a high degree of alignment between *The Path to 2030* and the 2030 Clean Power Plan. In NSUARB IR-201, Board staff asked if there were any material differences, NS Power responded:

> The elements of the Province of Nova Scotia's 2030 Clean Power Plan align with the elements of the Updated IRP Action Plan (based on the outcomes of the Evergreen IRP). The only item of note when comparing the two plans is that in some cases, the identified quantity of new capacity for certain resources in the 2030 Clean Power Plan are more prescriptive than the ranges provided in the updated IRP Action Plan.
>
> [Exhibit N-9, Response IR-201, PDF 1275]

[111] *The Path to 2030* describes, in more detail, the required resources outlined in the Executive Summary. The goal of the Province's Rate Base Procurement (RBP) program is for NS Power to enter into power purchase agreements for 1,100 GWh of low-

impact electricity as envisaged by s. 6B(2)(b) of the *Renewable Electricity Regulations*, with in-service dates specified in each contract. Five RBP projects have been selected "…which will provide a total of 373 MW and 1,478 GWh of new wind generation to the Nova Scotia system" [Exhibit N-2, p. 13]. At the time *The Path to 2030* was written, NS Power had completed three of five facilities studies associated with these RBP projects. At the hearing NS Power confirmed this was still the case. These studies are needed to determine what is required to integrate the projects into the grid.

[112] The Province's Green Choice program was established in 2022 through amendments to the *Electricity Act*. The goal of the Green Choice Program is to build up to 350 MW of capacity from new low-impact renewable generation to allow large energy consumers to contract for this energy so they can achieve their greenhouse gas emissions reduction targets. In turn, this will also support NS Power's need to meet its 2030 carbon reduction targets. This is a voluntary corporate renewables program. The Green Choice Program is administered by COHO Climate Advisors LLC (COHO). COHO issued a request for proposals on December 1, 2023, soliciting interested and eligible energy consumers for the Green Choice Program. The Board notes that it approved the form of Power Purchase Agreement used to support the Green Choice Program on June 6, 2024.

[113] In addition to the studies required for interconnection, NS Power discussed its role in providing support, feedback, facilities studies, administration, and customer support, in relation to the RBP and Green Choice Program.

[114] When discussing renewable resources, NS Power addressed a proposed 168 MW wind farm that a Port Hawkesbury Paper affiliate plans to build to supply part of its

load. Commercial operation is expected in late 2025. NS Power discussed the Renewable to Retail electricity market that allows independent licensed retailers to sell renewable energy directly to customers. NS Power indicated it is aware of 150 MW of proposed new wind generation under this program with a potential in-service date in 2024. NS Power also addressed the Community Solar Garden Program with a potential combined capacity of 100 MW by 2025. NS Power also said commercial net metering was an anticipated source of solar power.

[115] NS Power appears confident that approximately 1,100 MW of new renewable generation from the above programs will be available before 2030. The Utility says this represents a significant portion of the procurements identified in the Nova Scotia 2030 Clean Power Plan, although additional procurement activities are contemplated starting in the 2025-2027 timeframe and would likely be based on updated resource modeling and "…relevant developments in other sectors and programs." [Exhibit N-2, p. 20].

[116] The foregoing renewable energy sources primarily involve NS Power purchasing power from third parties through legislated programs. NS Power is also planning capital expenditures under its Eastern Clean Energy Initiative (ECEI). Originally, NS Power contemplated developing its own wind farms to generate 160 MW of new renewable energy. With the establishment of the renewable electricity programs discussed above, NS Power has now divested itself of its interest in these potential wind projects. *The Path to 2030* contemplates the following NS Power ECEI projects: three 50 MW Battery Energy Storage System (BESS) projects; a Reliability Tie Project in conjunction with New Brunswick Power to install a second 345 kV transmission line between Onslow, Nova Scotia and Salisbury, New Brunswick; up to 600 MW of new fast

acting generation; a natural gas conversion project for the Point Tupper Generating Station Unit 2 to supply peaking capacity (150 MW); and, a heavy fuel oil conversion project to provide peaking capacity at Lingan Units 1, 2, and 4 (approximately 450 MW in total).

[117] Initially, *The Path to 2030* indicated there could be two phases to the BESS Project, one where the Province prescribed the location and type of projects and another based on plans NS Power was developing for three 50 MW, four-hour battery storage facilities located at 99W Bridgewater, 132H Spider Lake and 43C Canaan Road substations. A BESS capital approval application was filed with the Board, based on s. 4D of the *Electricity Act*, which prescribed BESS projects of the same type, and at the same locations, as NS Power indicated it was developing in *The Path to 2030*. NS Power confirmed these three BESS facilities were the ones described as the NS Power BESS Project in *The Path to 2030* timeline. NS Power had no details on what additional BESS projects were being planned. The Utility had not been planning any others.

[118] The Board approved the BESS Project on June 13, 2024 (2024 NSUARB 100). NS Power was able to obtain $116.6 million from federal funding sources. Therefore, out of an estimated total project cost of $354.3 million, the projected capital cost attributable to ratepayers is approximately $237.7 million. It is anticipated that two of the BESS sites will be in service in 2025 and the third one is scheduled to be in service in 2026.

[119] The Reliability Tie Project is shown as an item for subsequent submittal in the 2024 ACE Plan. It is anticipated that the capital approval request will be submitted late in 2024 or early 2025. NS Power received the required approval from the Minister of

Environment and Climate Change on December 15, 2023. NS Power believes NB Power will file for environmental approval in New Brunswick in 2024. A Collaboration Agreement has been signed with the Kwilmu'kw Maw-klusuaqn Negotiation Office, the treaty rights negotiating arm for 11 Mi'kmaq First Nations. Stakeholder engagements, primarily with those with interests in the transmission line corridor, are taking place. The detailed design engineering contract was awarded and work commenced in October 2023.

[120] The Board asked why the estimated projected cost of the Reliability Tie Project had gone from $459.5 million in the 2023 ACE Plan to $811.5 million in the 2024 ACE Plan. In response to NSUARB IR-11(g), NS Power said the overarching scope of the project had not changed, but had been refined, and the cost forecast updated, based on further preliminary engineering. This response was clarified during the oral hearing when NS Power explained that the revised figure did not include any contribution from NB Power and the federal government. Negotiations continue.

[121] The Board notes there is a potential Phase 2 to the Reliability Tie Project to incorporate a transmission build from Salisbury to Point Lepreau in New Brunswick. The goal would be to enable greater access to energy imports from New Brunswick, Quebec, and New England. This possibility is raised in the Nova Scotia Clean Power Plan and a report from the Province of New Brunswick. Future engineering and economic studies are contemplated for 2024 and 2025.

[122] NS Power continues its work on fast-acting generation. NS Power says the results of an initial analysis indicates a combination of reciprocal internal combustion engines and combustion turbine units "provide optimal value to the system." Fuel flexibility is important, including the possibility of hydrogen and biodiesel, given the potential limits

on carbon-based fuels, such as natural gas and light fuel oil, currently being discussed in consultations on the federal *Clean Electricity Regulations.* NS Power has looked at location selection. The Utility is developing an Engineering, Procurement and Construction approach to obtain the first 300 MW of fast acting generation by 2027.

[123] NS Power is currently developing milestones and project timelines for the coal to gas and heavy fuel oil to gas conversion projects slated for 2028 and 2028-2030, respectively. These projects must be coordinated with the timelines for the retirement of the coal plants. *The Path to 2030* lists the projected retirement dates of each coal plant unit, along with notes on any conversion. This information comes from the 2023 10-year System Outlook report. The Board notes this is an annual report. The 2024 version has recently been filed with the Board.

[124] In addition to ancillary services provided by the BESS Project, there will be grid support technologies and processes needed to integrate the intermittent renewable energy sources described in *The Path to 2030* in a stable, reliable manner, while maintaining power quality. Mitigation measures were outlined in NS Power's *Large Scale Integration of Inverter Based Resources in Nova Scotia*, released on December 8, 2023, as part of the Evergreen IRP Action Plan. They include inverter-based resources system design, synchronous condensers, flexible AC transmission system devices, static Var compensators, static synchronous compensators, switched and static capacitor banks, fast-acting synchronous generation, transmission connections, and operating guidelines.

[125] NS Power has identified a series of measures it will be working on in 2024:

- Verify network response under high Rate of Change of Frequency (RoCoF).
- Regularly review and recommend updates to the Transmission System Interconnection Requirements to address concerns identified during system study (RoCoF, models, harmonics, voltage, BESS, Solar, grid forming requirement for IBR).

- As synchronous plants are retired, additional grid support for inertia and System strength is expected to be required. It is recommended that studies be undertaken to determine the optimal locations for the grid support.
- Update IBR and inertia constraints for Plexos modelling.
- Perform an annual assessment of NSPI System Inertia and Strength requirements in the 10-year horizon to identify potential issue (NS Power anticipates including this in the 2024 10-Year System Outlook Report).
- Document and publish updated model requirements for Load and Generation customers.
- Perform a system study of the expected load growth and hydro generation availability for western Nova Scotia.

[Exhibit N-2, pp. 23-24]

[126] *The Path to 2030* also highlights other issues that impact planning for 2030. These include electrification and load forecasting, demand side management, hybrid peak and associated load management and demand response, the potential impacts on demand caused by the green hydrogen initiatives in the Province, along with projected offshore wind projects.

[127] *The Path to 2030* provides an accountability matrix for each project. It outlines the key action items and who is responsible for their execution. The Province is listed as responsible for many action items, given the policy and administrative aspects of certain of these items. NS Power remains ultimately responsible for achieving the 2030 legislated targets. A working group has been established between the Province and NS Power with a goal of proceeding with the clean energy transition in a collaborative manner.

[128] Finally, *The Path to 2030* outlines the numerous risks associated with the clean energy transition timeline. These include supply chain issues, inflation, constraints on human resources, potential project approval delays, transition planning, and the evolving policy landscape.

[129] The Intervenors who commented on *The Path to 2030* document were generally supportive of the scope of the document. NRR's opening statement noted the alignment between *The Path to 2030*, the Evergreen IRP Action Plan, and the Nova Scotia 2030 Clean Power Plan. In their opening statement, the SBA said:

> The Report provided insight into the broader plan by NSPI on what is needed to be done in order to reach both the environmental and load needs of Nova Scotians over the next 6 years, and how the ACE Plans work within that outline. In doing so, it creates the opportunity to test whether the ACE Plan projects are appropriate not only on an annual level, but whether they are prudent on a longer-term level. It is beneficial for everyone to have an understanding of the long-term horizon as we transition.
>
> [Exhibit N-23, p. 1]

[130] Mr. Wilson expressed concerns about the level of engagement relating to the ECEI projects, saying that, as far as he was aware, there had been little to no stakeholder engagement surrounding the development of the Reliability Tie Project. He was also concerned about the current lack of detail about how NS Power will demonstrate the cost effectiveness of the Reliability Tie Project and the coal plant conversions, noting that NS Power was not required to do this with the BESS Project because it was prescribed in legislation.

[131] Mr. Wilson said there were risks NS Power would not meet the legislated deadlines. In addition to rapidly evolving work around wind integration and the need for synchronous condensers and other transmission facility upgrades, he pointed to two key aspects of the Reliability Tie Project: the amount of civil engineering required beyond typical transmission line construction, and the challenges NS Power has acknowledged concerning high-voltage supply chains.

[132] Mr. Wilson made three recommendations about *The Path to 2030*:

> 1. Engage directly with stakeholders during the modeling and analysis process when developing ECEI applications, rather than simply providing discovery responses that explain model findings. (Page 13)
>
> 2. Accelerate progress towards achieving the Province's 2030 Clean Power Plan by:

> a. Creating a technical advisory forum to engage with technical experts from wind, solar, and energy storage companies (or their engineering consultants) around the subject of interconnection and reliability standards;
>
> b. Encouraging the provincial governments of Nova Scotia and New Brunswick to directly engage with both utilities to accelerate the Reliability Tie, if such activities are not already occurring;
>
> c. Addressing supply chain constraints by developing a procurement plan to pre-order equipment that is likely to be needed for transmission and distribution system upgrades as part of upgrading its transmission system and improving overall system reliability; and
>
> d. Giving greater consideration to improving geothermal technologies as opportunities to address Nova Scotia's future resource needs. (Page 16)
>
> 3. Accelerate and expand its investigation into applying dynamic line ratings and other grid enhancing technologies in order to facilitate the wind and other resources identified in the Province's 2030 plan. (Page 19)
>
> [Exhibit N-15, p. 8]

[133] NS Power responded to Mr. Wilson's first recommendation by agreeing stakeholder engagement is important. The Utility said the IRP process has significant stakeholder engagement. NS Power said it is willing to do stakeholder engagement on individual projects as was done with the BESS Project. Addressing Mr. Wilson's recommendation 2(a), NS Power said the IRP process already involves work that a proposed technical advisory forum would accomplish. In addition, the Utility engages with other jurisdictions and attends workshops where it engages with system operators and external planning groups. Responding to recommendation 2(b), NS Power said it was already actively involved in discussions with the federal government and provincial governments, including Nova Scotia and New Brunswick. With respect to recommendation 2(c), NS Power indicated that supply chain issues are being addressed. The procurement process involves a market assessment and NS Power is engaged early with suppliers through expressions of interest and RFPs. NS Power said it had already looked at geothermal technology, as raised in recommendation 2(d), in the Evergreen

IRP process and the Evergreen IRP roadmap updates remained the best forum to review this issue.

[134] In its Rebuttal Evidence, NS Power provided a detailed update on the progress it is making on the dynamic line ratings and other grid enhancing technologies, including contacting 10 vendors and participating in 12 solutions demonstrations. NS Power has continued research to better understand the technology and help advance a business case. An RFP has been issued. Responses were expected in late April 2024. NS Power indicated all was on track for a capital filing about dynamic line ratings and other associated technology in the 2025 ACE Plan. Mr. Wilson was satisfied with NS Power's response. The Board is as well.

2.5.1 Findings

[135] The Board finds *The Path to 2030* responds to the Board's directive about providing a plan showing how NS Power is going to meet the legislated decarbonization goals by 2030. The document is detailed and comprehensive. It synthesizes work done on several fronts, including many Board proceedings. The plan shows what resources are needed to achieve the 2030 targets, based on current knowledge, recognizing there may be a need to react to new learnings and any new policy directives, or changes to the existing ones. The plan has appropriate timelines that, if met, indicate the 2030 targets will be achieved. That said, the Board agrees with the comments NRR made in its opening statement:

> … The timeline is short. Significant and sustained effort is required to obtain the legislated 2030 standards. Diligence in tracking the success of NS Power's strategy by NS Powers, stakeholders, and the Board will be critical to ensuring that legislated standards will be met. All parties must remain alert for any issues which may arise with NS Power's strategy in the coming years to ensure they are identified, and that NS Power's strategy can be adapted as needed in a timely and cost-efficient manner.
>
> [Exhibit N-22, p. 1]

[136] There are a multitude of Board proceedings, consultations and discussions with governments and industry and stakeholder engagement that impact on *The Path to 2030*. The Evergreen IRP update process provides the most updated technical and modelling scenarios, identifying what resources are required to achieve the 2030 requirements. Other Board proceedings include the annual 10-Year System Outlook filings, the annual Load Forecast report, annual Demand Side Management filings, along with individual capital project filings. These all provide new information and key data required to assess whether the goals of *The Path to 2030* are being achieved.

[137] It is important to have a proceeding where the current status of *The Path to 2030* can be reviewed on a more holistic basis. The annual ACE Plan provides the best vehicle for such an update. This does not mean that all technical information and cost assumptions must be reviewed in detail in one proceeding. However, a section of the ACE Plan detailing how the matters addressed in *The Path to 2030* are advancing, along with any challenges associated with the projects and timelines discussed in the plan, would be beneficial to all. The Board, therefore, directs that NS Power file such an update in the ACE Plan on an annual basis until 2030.

[138] The issue of stakeholder engagement on individual ECEI projects has been raised in past ACE Plans. It was again in this one. As all parties know, the Board has actively promoted stakeholder engagement for many years. The issue is the timing and extent of this engagement. NS Power undoubtedly faces many challenges that require concerted efforts on many fronts. The Board is reluctant to impose engagement processes that duplicate existing ones. The Board agrees with NS Power that the

Evergreen IRP process is the best opportunity to deal with detailed technical and modelling issues.

[139] The Board is not convinced that ordering a separate stakeholder process while the ECEI projects are being developed is necessary. Adding another forum for engagement may not make the projects timelier. Also, one of the key components in assessing the relative cost effectiveness of projects may be the level of available government funding. This involves confidential negotiations. In fact, without significant third-party funding, the expenditures required to meet *The Path to 2030* worsen very real affordability issues. Even with third-party funding, the impact on rates, at least in the near term to mid-term, will likely be material. A more meaningful engagement on which individual project solutions best address *The Path to 2030* resource requirements probably must be informed by what third-party funding, if any, is available. Also, the Board agrees with stakeholders that the working group involving the Province and NS Power is encouraging. This is an area, in addition to the IRP process, where technical challenges can be discussed, and presumably expertise sought, if issues arise.

[140] Beyond the working group with the Province, which NS Power indicates meets biweekly, the Board is further satisfied that NS Power is pursuing consultations with the appropriate federal and regional government entities in advancing *The Path to 2030* objectives. It expects this will continue, given it is in the best interests of not only ratepayers, but shareholders. No specific directions are required.

[141] NS Power provided details on how it is addressing supply chain issues through its procurement strategy. The Board is satisfied NS Power is attempting to mitigate the issue to the extent possible at this stage. The Board is further satisfied with

NS Power's response to the geothermal capacity issue and that this is best addressed in the Evergreen IRP process.

[142] There is no doubt many challenges remain. One uncertainty continues to be the potential impact of the proposed federal *Clean Electricity Regulations* on *The Path to 2030*. The major concern is what levels of fast-acting generation can be fueled by natural gas and fuel oil. While the need for fast-acting generation is acknowledged, the devil is in the details. NS Power appears confident the final version of the federal regulations will allow its plans to proceed. This is an area that is currently beyond its control. While the fast-acting generation projects, and particularly the coal plant conversions, appear later in the timeline, given the magnitude of the proposed expenditures, this issue will obviously have to be resolved soon, so NS Power can either go forward with its plans or shift strategies.

[143] Looking more closely at the specifics of *The Path to 2030*, the various wind and solar resource procurements appear to be progressing within timeframes consistent with those in the plan. One BESS project has been approved with an in-service date consistent with the plan timeline, provided project execution proceeds as planned. It remains uncertain what other BESS projects are being contemplated for prescription by the Province. The Reliability Tie is progressing, and NS Power appears confident a capital filing will be made in the last quarter of 2024, or early in 2025. That said, outside funding is not confirmed and this is a project being done in conjunction with NB Power. Work needs to be done to get the necessary approvals in New Brunswick. NS Power is also making relatively rapid progress on coming to grips with the need for grid stabilizing technology to integrate wind, although more work is left to be done. The fast-acting and

coal conversion components of the plan appear to be the least advanced and involve some of the largest projected costs.

[144] The Board concludes that *The Path to 2030* provides a detailed plan to achieve the 2030 legislated clean energy target of 80% of electricity generated by renewables and the retirement of all coal plants. That said, the timeline is very tight, many uncertainties remain, and a concerted effort by NS Power, and collaboration by federal and provincial governments will be required to maintain the current momentum. The Board looks forward to the update on how matters are progressing in the 2025 ACE Plan.

2.6 Mersey Hydro Redevelopment Plan

[145] The Mersey Redevelopment Project is a long-term project aimed at redevelopment of NS Power's complete Mersey River hydro system. The total cost of the Redevelopment Project was estimated to be $1.13 billion in NS Power's 2023 ACE Plan. In response to NSUARB IR-197 in the current proceeding, the estimated total cost for the redevelopment project is now $1.205 billion.

[146] As noted in NS Power's 2022 ACE Plan application, Phase 1 of the Redevelopment Project includes the replacement of the Big Falls powerhouse and the control structure, and redevelopment of the substation. Phase 1 of the Mersey Redevelopment Project was included in every NS Power ACE Plan application between 2017 and 2022 as a subsequent submittal item. As such, NS Power's intent was to submit the project for Board approval following the related ACE plan application but prior to the subsequent ACE Plan application.

[147] In the 2023 ACE Plan application, NS Power indicated that the Phase 1 project had been deferred until 2031. The Company stated that the deferral will allow it to

continue evaluating the fundamental project alternatives with consideration for key items, including how the project fits into the overall plan to achieve 80% renewable energy by 2030 while managing asset risk, evolving fisheries permitting requirements and affordability. With the deferral, NS Power also noted that additional risk mitigation strategies are required to sustain the safe, environmentally compliant operation of the Mersey Hydro System. These additional risk mitigation strategies will lead to increased maintenance and sustaining capital costs. NS Power further stated:

> The deferral of the Mersey Redevelopment work is consistent with NS Power's asset management methodologies. Where possible, deferring projects where safety and economic risks associated with the project can be managed is in the best interest of customers. This approach also ensures the Company can complete the required engineering and engagement for a project of this complexity and magnitude in order to be in a position to submit a complete application to the NSUARB for approval.
>
> [Exhibit N-1, Appendix G, p. 9]

[148] The Board's 2023 ACE Plan Order directed NS Power to provide a comprehensive update on the Mersey Hydro Redevelopment Project in the 2024 ACE Plan. The Board's 2023 ACE Plan Decision also stated that this update should address the concerns that Mr. Wilson and the Board expressed during the 2023 ACE Plan proceeding, so that a fulsome and robust evaluation of the cost impact of the deferral can be completed and compared to other alternatives. These concerns included the issue of whether the redevelopment deferral may increase costs and risk to ratepayers. In accordance with a 2023 ACE Plan directive, NS Power provided a comprehensive update on the Mersey Hydro Redevelopment Project in Appendix G of the 2024 ACE Plan application.

[149] To facilitate the safe deferral of the Mersey Hydro Redevelopment project, NS Power identified $21.9 million in incremental, smaller scale sustaining investments which will be required before the start of the Redevelopment project in 2031. These costs were

initially incorporated into the Company's 2023 Hydro Interval Plan (HIP). The HIP provides an annual high-level directional overview of the Company's estimated annual capital expenditures that will be required for its hydro generation assets over the next 40 years. NS Power identified further required sustaining capital investments during preparation of the 2024 ACE Plan application. As such, an additional $12.5 million in Mersey Hydro system sustaining capital costs from 2024 to 2030 was incorporated into the Company's 2024 HIP. Further details were provided in response to NSUARB IR-197.

[150] In the 2024 ACE Plan application, NS Power provided clarity about the HIP estimates:

> The HIP incorporates the best information available at the time of planning, as well as predictions about potential decisions that are subject to change as constraints and priorities evolve. As such, both the sustaining investment and forecast for the Mersey Redevelopment included in the HIP will change as additional information is obtained. In particular, the forecast cost and scope requirements associated with archaeology and environment will be refined as engagement and discussion continues and the associated impacts can be incorporated into long-term project planning. However, in order to confirm that investments in various hydro systems continue to be the lowest cost option for customers, the NPV figures included in the annual HIP updates provide a tool for analyzing the economics of various options.
>
> [Exhibit N-1, Appendix G, p. 10]

[151] NS Power's 2022 HIP was prepared under the assumption that the Mersey Redevelopment Project would proceed in 2022 (i.e., it would not be deferred to 2031). Appendix G of the 2024 ACE Plan application notes that the Net Present Value of Mersey Hydro system capital sustaining costs in the 2022 HIP was $44.9 million. The NPV of the Redevelopment Project in the 2022 HIP was $613.8 million. This gives a total NPV of $658.7 million from the 2022 HIP. In comparison, the 2024 HIP has the Redevelopment Project being deferred until 2031. Appendix G notes that the NPV of the Mersey Hydro system capital sustaining costs and the Redevelopment Project in the 2024 HIP are $69.7 million and $460.8 million, respectively, for a total NPV of $530.5 million. Therefore, NS

Power stated that deferral of the Redevelopment Project results in an NPV savings of $128.2 million, resulting in the best option for customers while still maintaining the safe and reliable operation of the Mersey Hydro system.

[152] Mr. Goggin provided evidence related to the prudency of NS Power's proposed capital sustaining investment for the Mersey Hydro system. His primary concern is that NS Power has not completed an up-to-date analysis of the decommissioning cost of the Mersey Hydro system. In particular, he noted that NS Power is relying on decommissioning cost data from its 2020 IRP in assessing the relative costs of continuing to operate the system versus decommissioning. Mr. Goggin even suggested that several recent factors could now result in the 2020 IRP analysis being out of date, with the decommissioning option now potentially being more economically attractive than continued operation of the system. These factors include the decline in cost of alternative resources to replace the energy and capacity provided by the Mersey Hydro system since 2020, as well as recent tax credits that are available for these alternative resources. Mr. Goggin also stated there is a risk that NS Power's estimated sustaining capital costs for the Mersey Hydro system will increase, and may not even be necessary under a decommissioning scenario.

[153] Mr. Goggin's evidence stated:

> Unfortunately, we do not have a complete picture of the relative net benefits of decommissioning versus redevelopment versus deferral because NS Power did not evaluate a decommissioning scenario in the 2024 ACE Plan, though the above factors strongly point to decommissioning being the optimal choice. In response to discovery, "NS Power acknowledges that both decommissioning and sustaining costs will have changed since the 2020 IRP analysis, and accordingly will consider the associated impacts prior to commencing re-development." However, this commitment to "consider the associated impacts prior to commencing re-development" does not indicate that NS Power will compare sustaining versus decommissioning costs before making the sustaining investments. That is the crucial question that must be answered before NS Power makes sustaining investments in an asset that potentially should be decommissioned.
>
> [Exhibit N-14, p. 6]

As such, Mr. Goggin recommended that the Board direct NS Power to evaluate the net benefits and costs of a decommissioning scenario before determining whether the proposed system sustaining capital investments are prudent.

[154] In its Rebuttal Evidence, NS Power stated that the Mersey Hydro system is part of the Company's plan as it moves toward 2030, where there are requirements for NS Power to have 80% renewable energy generation. The Company noted that the Mersey Hydro system supports this path by providing valuable capacity and renewable energy. In addition, NS Power stated that the stakeholder engagement and permitting processes would be very complex for the Mersey Redevelopment Project and for a decommissioning scenario. It would take years to complete engineering designs, permitting, and alignment of stakeholders before a decommissioning process could be initiated on the Mersey Hydro System. In the interim, the capital sustaining investment identified in the 2024 ACE Plan is required to ensure safe and reliable water management. Therefore, NS Power asserted that as it continues to evaluate the long-term benefits of re-development or decommissioning of the Mersey, the 2024 to 2030 sustaining capital investments outlined within the 2024 ACE Plan for the system are required investments in either event. The Company also affirmed that deferral of a major system investment in either redevelopment or decommissioning is in the best interest of customers.

2.6.1 Findings

[155] During the hearing, the CA questioned the NS Power panel about its evidence related to the proposed sustaining capital investments prior to 2031:

> **Q.** (Roberts) Okay. I just have a couple of questions in relation to the rebuttal evidence response to Mr. Goggin's report as you -- that's Exhibit N-14. And as you would be aware, he provided his views about the prudence of continuing to make sustaining capital investments in the Mersey Hydro system rather than reevaluating the decommissioning of the system. And his - - one of his fundamental points is that there has been no

reassessment of the costs and the relative costs of decommissioning since 2020 and the IRP plan.

A. (MacIntosh) I can speak to the Mersey system. Can you please repeat your question?

Q. That you have -- although you -- part of your capital application here includes the sustaining capital costs for that project, you haven't done a re-evaluation of the costs associated with decommissioning since 2020.

A. (MacIntosh) Sure. So the scope of work for decommissioning has not changed. So the company has utilized the inputs through the IRP process to do this evaluation. So scope of work for decommissioning has not changed. The company, through its depreciation study, will update the decommissioning costs this year.

Q. But you say the scope of work hasn't changed, but a number of the cost factors surrounding it likely have changed since 2020?

A. (MacIntosh) Not in the material way to change our conclusions here in our evidence.

Q. Mr. Goggin draws attention to various tax incentives, tax programs that may make the cost of decommissioning much less than would have been the case four years ago.

A. (MacIntosh) Sure. So in our rebuttal evidence we spoke to the alternative of decommissioning. So if you were looking at Mersey system today, we're saying that the Mersey does not need to enter into either redevelopment or decommissioning at this time.

Following our asset management principles and practices, we -- customers don't need to make this major investment for decommissioning or redevelopment at this time.

So what we're saying here is that if you look at a cost pressure perspective, it's in the best interest of our customers to defer that decision past 2030. So regardless of the tax or replacement capacity costs, it's still in the best interest of our customers to defer that decision post-2030.

Q. But his point is that the customers are still being asked to pay the cost of sustaining the operation of the -- of the project, of the development.

A. (MacIntosh) We go into detail about the requirement for those sustaining costs. Mersey is part of our plan for 2030. We spoke to the contributions it makes towards RES on the system. It's part of our Path to 2030 plan. So the sustaining capital costs that are outlined in this application are for the safe water management of that system. So water control. So it's required now, regardless of decommissioning or redevelopment of that system.

Q. And you say you're undertaking a review this year?

A. (MacIntosh) So as part of the depreciation study that we will be filing, we will undergo reviewing of our decommissioning costs for the hydro system.

[Transcript, pp. 63-66]

[156] At this point, based on the evidence before it, the Boards finds that deferral of the Mersey Redevelopment Project is in the best interest of NS Power customers, as it results in a lower NPV compared to proceeding with the project now. As such, at least in the short-term, the Board agrees with NS Power that incremental sustaining capital investments will be required in the interim to ensure safe and reliable water management before the commencement of the Redevelopment Project. The Board also agrees with NS Power that these same sustaining investments would be required under a decommissioning scenario, given the long lead time required to start a decommissioning project.

[157] However, the Board also agrees with Mr. Goggin that further clarity is required to determine whether a Mersey redevelopment or decommissioning scenario is ultimately the best option for customers. This point was emphasized by the Board during hearing questioning:

> **Q.** **(**Murphy**)**. … I think at some point the Board needs -- well in advance of either one of those two projects to proceed, the Board needs a good, robust comparison between the two options because there's going to be a lot of lead time required between starting that redevelopment project and starting the decommissioning project.
>
> **A.** **(**MacIntosh**)** Right. As I mentioned this morning, Mr. Murphy, the company is undergoing a depreciation study to update decommissioning costs, so after that's completed we'll be in a better position to provide more information to the Board.
>
> **Q.** So we could expect it in 2025?
>
> **A.** (MacIntosh) Potentially, yes.
>
> **Q.** After the depreciation study.
>
> **A.** (MacIntosh) Yes.
>
> [Transcript, pp. 218-219]

[158] The CA submitted that the Board should direct NS Power to provide an updated analysis of the costs of decommissioning the Mersey Hydro system as part of the depreciation study it intends to file with the Board. The Board believes that the

updated analysis needs to be compared against an updated cost analysis of the Mersey Redevelopment option. Therefore, in its next depreciation study to be filed with the Board, NS Power is directed to include an updated capital cost estimate for the Mersey decommissioning option, complete with all assumptions used to develop the estimate. Further, after filing its depreciation study, NS Power is directed to also include an NPV analysis comparing the decommissioning option to the redevelopment option, complete with a description of all assumptions used in the analysis in its subsequent ACE Plan application.

[159] Finally, in its 2025 ACE Plan application, NS Power is directed once again to provide a comprehensive update on the Mersey Hydro System Redevelopment Project.

2.7 Cost Minimization

[160] The issue of NS Power's capital cost minimization efforts became an area of focus for the Board and stakeholders during the 2019 ACE Plan proceeding. As noted in the Board's 2021 and 2022 ACE Plan decisions, the Board considers it useful to address cost minimization through two separate themes. These include the effectiveness of NS Power's cost minimization practices, including capital cost budgeting and project scoping; and NS Power's capital project cost minimization and related project management practices themselves.

2.7.1 NS Power's Capital Project Cost Minimization Effectiveness, including Capital Cost Budgeting and Project Scoping

[161] The Board's 2023 ACE Plan Order directed NS Power as follows:

> 5) Continue to track the information referred to and as modified in Paragraphs [99] and [100] of the decision. The Board also directs that project C0021102 – L0529 Replacements and Upgrades be removed from Contingency Report (Appendix D) in any future ACE Plan applications.

[162] Paragraphs 99 and 100 from the Board's 2023 ACE Plan Decision stated:

> [99] Notwithstanding what appears to be some improvement in the effectiveness of NS Power's capital project cost minimization practices related to capital cost budgeting and project scoping, the Board finds that a continuing review of these practices is required. The Board, therefore, directs NS Power to continue to track the information noted in Paragraph [92] of the Board's 2020 ACE Plan decision for each completed capital project that was submitted for Board approval in 2017, 2018, 2019, 2020, 2021, 2022 and 2023 (either through or outside of the ACE Plan proceedings, including projects submitted for subsequent approval, but excluding U&U projects). Further the Board directs that the following information be included in the related 2024 ACE Plan reporting:
>
> - Identification of all new projects that have been added to the Contingency Report (Appendix D);
>
> - A summary table of Contingency Report (Appendix D) data, similar to Figure 76 in the 2023 ACE Plan application, organized by the year projects were placed in service;
>
> - A summary table of Contingency Report (Appendix D) data, similar to NS Power's response to NSUARB IR-65(d) in the 2023 ACE Plan application, organized by the year projects were submitted for Board approval; and
>
> - For any capital projects in the Contingency Report (Appendix D) that have a negative variance greater than or equal to 25% of the Board approved capital cost estimate, NS Power is to provide an explanation detailing the reasons for the variance.
>
> The Board also directs that project C0021102 – L0529 Replacements and Upgrades be removed from the Contingency Report (Appendix D) in any future ACE Plan applications.
>
> [100] The Board directs NS Power to continue to track this information, including information related to projects approved by the Board after 2023, and report it in future ACE Plan applications. The Board directs that the data continue to be presented in the 2023 ACE Plan application Appendix D format in future ACE Plan applications. This reporting is to also categorize projects by function (i.e., generation, transmission, distribution, and general plant), with "generation" projects further categorized by type of project (i.e., hydro, steam, gas, other renewables).

[163] NS Power provided the information related to the second and third bullet items from Paragraph 99 noted above on pages 149 and 150 in its 2024 ACE Plan application. This information is intended to allow the Board to better discern trends over time in NS Power's capital cost estimating and spending performance. The Utility submitted the remaining material directed in Paragraphs 99 and 100 of the 2023 ACE Plan decision in Appendix D of its 2024 ACE Plan application. Appendix D presents an analysis comparing Board approved project budget amounts to final spending on the completed projects.

Appendix D provides the Board with information to better assess NS Power's capital cost minimization and capital cost budgeting effectiveness, as well as its use of contingencies.

[164] In response to NSUARB IR-196, NS Power answered a number of questions related to the 2024 ACE Plan Appendix D data. The Board has summarized the Utility's responses as follows, and included, where relevant, comparative figures from the 2023, 2022, 2021 and 2020 ACE Plan proceedings in brackets:

- There are 356 projects included in Appendix D (314 projects were included in Appendix D of the 2022 ACE Plan application).
- The average variance for the listed projects amounts to approximately +5.5% of the original submission approved project cost estimate (2023: +4.7%; 2022: +9.5%; 2021: +10.8%; 2020: +10.47%).
- The total net variance of $26,323,088 for the listed projects is over and above the total contingency amount of $31,738,772 included in the total of the original submission approved cost estimates.
- The average contingency amount for the listed projects amounts to approximately 7.1% of the original submission approved cost estimate less the contingency amount (2023: 7.0%; 2022: 5.9%; 2021: 5.6%; 2020: 5.03%).
- For projects that have an original submission approved cost estimate greater than $5,000,000, amounting to 16 projects in total:
    a. 31% had a negative variance (2023: 36%; 2022: 0%; 2021: 0%; 2020: 33%);
    b. 69% had a positive variance (2023: 64%; 2022: 100%; 2021: 100%; 2020: 67%); and
    c. Of the projects that had a positive variance, 100%, or nine projects, did not require an ATO submission to the Board.
- For all projects that have an original submission approved cost estimate less than $250,000, amounting to 17 projects in total, the total sum of the individual project variances as a percentage of the total sum of the individual project original submission approved cost estimates is 216% (2023: 216%; 2022: 206%; 2021: 206%; 2020: 210%). These projects did not change from the 2023 ACE Plan application, and updated for their subsequently approved greater than $250,000 submissions, the total sum of the individual project variances as

a percentage of the total sum of the individual project original submission approved cost estimates is 9% (2023: 9%; 2022: 10%; 2021: 10%: 2020: 9%).

[165] NS Power also provided the following information in response to NSUARB IR-196:

- For projects approved by the Board prior to November 8, 2019, amounting to 229 projects in total:
    a. 27% (61 projects) had a negative variance;
    b. 73% (168 projects) had a positive variance; and
    c. Of the projects that had a positive variance, 138 projects did not require an ATO submission to the Board.
- For projects approved by the Board after November 8, 2019, amounting to 111 projects in total:
    a. 43% (48 projects) had a negative variance;
    b. 57% (63 projects) had a positive variance; and
    c. Of the projects that had a positive variance, 59 projects did not require an ATO submission to the Board.

Upon review, the Board does not believe that this information is entirely accurate. In response to NSUARB IR-89(h) in the 2023 ACE Plan proceeding, NS Power stated that there were 271 projects in Appendix D of the 2023 ACE Plan application that were approved by the Board prior to November 8, 2018, and that had original approved cost estimates greater than $250,000 and less than $5 million. The Board would not expect the number of projects that meet these criteria to decrease in the 2024 ACE plan application, as suggested by NS Power in the first bullet above. The Board suspects that in providing the bulleted information above, NS Power may have inadvertently omitted projects approved in the 2019 ACE Plan application, which were approved on May 1, 2019.

[166] As such, to provide a fair comparison with information submitted in previous ACE Plan applications, the Board completed its own analysis of the 2024 ACE Plan Appendix D data. This analysis produced the following results:

- For projects approved by the Board prior to November 8, 2019, that have an original submission approved cost estimate greater than $250,000 but less than $5,000,000, amounting to 289 projects in total:

    a. 31% had a negative variance (2023: 32%; 2022: 31%; 2021: 28%; 2020: 31%);

    b. 69% had a positive variance (2023: 68%; 2022: 69%; 2021: 72%; 2020: 69%); and

    c. Of the projects that had a positive variance, 91%, or 182 projects did not require an ATO submission to the Board (2023: 92%; 2022: 92%; 2021: 92%; 2020: 91%).

- For projects approved by the Board after November 8, 2019, that have an original submission approved cost estimate greater than $1,000,000 but less than $5,000,000, amounting to 34 projects in total (there were only 12 projects in the 2023 ACE Plan Appendix D that met this criteria):

    a. 59% had a negative variance (2022: 33%);

    b. 41% had a positive variance (2022: 67%); and

    c. Of the projects that had a positive variance, 100%, or 14 projects, did not require an ATO submission to the Board (2023: 100%).

[167] A further review by the Board of the data in Appendix D of the 2024 ACE Plan application reveals the following (the Board has provided the comparative percentages from the 2023, 2022, 2021 and 2020 ACE Plan proceedings in brackets):

- For projects that have a negative variance, the total variance amount is approximately $20.83 million or 4.4% of the total of the original approved cost estimates (2023: 5.7%; 2022: 3.2%; 2021: 2.7%; 2020: 3.1%).

- For projects that have a positive variance, the total variance amount is approximately $47.15 million or 9.9% of the total of the original approved cost estimates (2023: 10.5%; 2022: 12.7%; 2021: 13.5%; 2020: 13.6%).

[168] Based on the year that each project listed in Appendix D was placed into service, Figure 90 of the application provided the following additional information:

- 73% of the projects listed in Appendix D have a variance to the original approved estimate that falls within the expected accuracy range of -20% to +30% for an AACE (Association for Advancement of Cost Engineering) Class 3 cost estimate.

- 17% of the projects listed in Appendix D have a variance to the original approved estimate greater than +30%.

Further, in response to NSUARB IR-106(a), NS Power provided the following comparison of the Figure 90 information versus similar summary data from its 2023, 2022 and 2021 ACE Plan applications:

All Years	Total # of projects placed in service	Percentage of projects under-spent by greater than 20%	Percentage of projects with total spending between - 20% and +30% of budget	Percentage of Projects over-spent by greater than 30%
2021 ACE Plan	154	8%	71%	21%
2022 ACE Plan	211	10%	72%	18%
2023 ACE Plan	315	10%	72%	18%
2024 ACE Plan	356	10%	73%	17%

[Exhibit N-9, Response to NSUARB IR-106(a)]

[169] The original approved project budgets noted in Appendix D are typically prepared at an AACE Class 3 level. As noted during the 2021 ACE Plan proceeding, AACE Class 3 capital cost estimating expectations generally suggest that no more than 10% of capital projects should have final spending exceeding the +30% upper accuracy limit; no more than 10% of capital projects should have final spending less than the -20% lower accuracy limit; and, at least 80% of capital projects should incur final spending falling within these accuracy limits. In its 2024 ACE Plan application, NS Power stated that while Figure 90 shows the number of projects overspent by more than 30% slightly

exceeds what can be expected from a portfolio of projects with Class 3 estimates, the trend is continuing in a positive direction and NS Power's performance is approaching the expected range. In response to NSUARB IR-106(b), the Utility also noted that of the 43 projects added to Appendix D since the 2023 ACE Plan application, only three projects (or 7%), have an overspend of greater than 30%.

[170] In his evidence, Mr. Wilson concurred with NS Power's observation that the trend appears to be in a positive direction. However, he also stated that the observed trend is very brief and suggested that the related data is subject to selectivity bias. Mr. Wilson, therefore, indicated that it is too early to conclude the Company is approaching the expected range. As such, he recommended that NS Power be directed to continue including the Appendix D contingency directive in future ACE Plan applications. In its Rebuttal Evidence, NS Power confirmed that it will continue to provide this information if directed by the Board.

[171] With regards to projects that had a negative project spending variance greater than or equal to 25%, NS Power provided a list of these projects, complete with detailed reasons for the associated variances, in Appendix D of its application. Twenty-five of the projects in Appendix D have negative variances greater than 25%, primarily due to:

- Reduced scope following more detailed assessments;
- Labour costs being less than initially estimated. Contingency was not required;
- Contractor costs being less than initially estimated. Contingency was not required; and,
- Savings in contract and materials costs. Contingency was not required.

2.7.1.1 Findings

[172] NS Power has stated that Figure 90 in its application shows that the Company's cost estimating trend is continuing in a positive direction and its performance is approaching the expected AACE range. The Board has reproduced Figure 90 from the application as follows, with numbers from the 2023 ACE Plan provided for comparison in brackets:

Year	Total # of projects placed in service	Percentage of projects under-spent by greater than 20%	Percentage of projects with total spending between -20% and +30% of budget	Percentage of Projects over-spent by greater than 30%
2016	4	0%	25%	75%
2017	72 (71)	8% (8%)	63% (63%)	29% (28%)
2018	95 (91)	11% (10%)	72% (73%)	18% (18%)
2019	89 (84)	8% (10%)	83% (82%)	9% (8%)
2020	36 (30)	14% (10%)	72% (73%)	14% (17%)
2021	34 (26)	9% (8%)	74% (73%)	18% (19%)
2022	19 (8)	16% (38%)	74% (50%)	11% (13%)
2023	7	0%	100%	0%

The Board believes that this comparison does, in fact, support NS Power's assertion of an improving trend. In addition, the Company's response to NSUARB IR-106(a) shows an improving trend in cost estimating accuracy between the 2021 and 2024 ACE Plan applications. Although NS Power's "percentage of projects over-spent by greater than 30%" still exceeds expectations, the Board is encouraged that of the 43 projects added

to Appendix D since the 2023 ACE Plan application, only three projects (or 7%), have an overspend of greater than 30%.

[173] As per the Board's 2023 ACE Plan Order, NS Power also provided Figure 91 in its 2024 ACE Plan application, which gives a summary table of the Appendix D data organized by the year that projects were submitted for Board approval. In its 2022 ACE Plan decision, the Board noted that presenting the data in this format will allow the Board to better discern trends over time in NS Power's capital cost estimating and spending performance. The Board has reproduced Figure 91 from the application as follows, with numbers from the 2023 ACE Plan provided for comparison in brackets:

Year	Total # of projects submitted for Board approval	Percentage of projects under-spent by greater than 20%	Percentage of projects with total spending between -20% and +30% of budget	Percentage of Projects over-spent by greater than 30%
2015	1	0%	0%	100%
2016	7	0%	29%	71%
2017	112 (109)	7% (6%)	67% (69%)	26% (26%)
2018	108 (101)	13% (13%)	69% (69%)	19% (18%)
2019	85 (77)	7% (9%)	85% (84%)	8% (6%)
2020	23 (13)	4% (15%)	96% (85%)	0% (0%)
2021	6 (3)	33 (33)	67% (67%)	0% (0%)
2022	12 (3)	25% (67%)	75% (33%)	0% (0%)
2023	2	0%	100%	0%

[174] The Board finds that this table also suggests an improving trend in NS Power's cost estimating and/or project execution over time. However, this trend must recognize

that 2021, 2022 and 2023 had a limited number of projects. If over time, a high degree of over-spending becomes evident, that would likely suggest either poor budgeting or poor cost-minimization practices by the Company. This is an issue that the Board will continue to monitor in future ACE Plan applications. Further, as noted in the Board's 2023 ACE Plan Decision, the trend of an increasing percentage of projects with under-spending greater than 20% since 2019 could, as suggested by Mr. Wilson's evidence, result from some "padding" of budgets submitted for Board approval. This is also an issue that the Board will continue to monitor in future ACE Plan applications. The Board will also continue to monitor large negative project variances in future ACE Plan proceedings to ensure that such variances related to significant project scope reduction do not skew NS Power's capital cost performance reporting.

[175] Notwithstanding what appears to be improvement over time in the effectiveness of NS Power's capital project cost minimization practices related to capital cost budgeting and project scoping, the Board finds that a continuing review of these practices is warranted. The Board, therefore, directs NS Power to continue to track the information noted in Paragraph 92 of the Board's 2020 ACE Plan decision for each completed capital project that was submitted for Board approval in 2017, 2018, 2019, 2020, 2021, 2022, 2023 and 2024 (either through or outside of the ACE Plan proceedings, including projects submitted for subsequent approval, but excluding U&U projects). Further the Board directs that the following information be included in the related 2025 ACE Plan reporting:

- Identification of all new projects that have been added to the Contingency Report (Appendix D);

- A summary table of Contingency Report (Appendix D) data, similar to Figure 90 in the 2024 ACE Plan application, organized by the year projects were placed in service;

- A summary table of Contingency Report (Appendix D) data, similar to NS Power's response to Figure 91 in the 2024 ACE Plan application, organized by the year projects were submitted for Board approval; and,

- For any capital projects in the Contingency Report (Appendix D) that have a negative variance greater than or equal to 25% of the Board approved capital cost estimate, NS Power is to provide an explanation detailing the reasons for the variance.

[176] The Board directs NS Power to continue to track this information, including information related to projects approved by the Board after 2024, and report it in future ACE Plan applications. The Board directs that the data continue to be presented in the 2024 ACE Plan application Appendix D format in future ACE Plan applications. This reporting is to also categorize projects by function (i.e., generation, transmission, distribution, and general plant), with "generation" projects further categorized by type of project (i.e., hydro, steam, gas, and other renewables).

[177] As noted previously, the Board is encouraged by the apparent improvement in NS Power's cost estimating and budgeting practices. Nonetheless, the Board will continue to look for improvement in future ACE Plan proceedings. If this does not occur, the Board may, at some point, direct NS Power to engage a third-party expert to review the Company's cost minimization and capital cost budgeting practices.

2.7.2 NS Power's Capital Project Cost Minimization and Related Project Management Practices

[178] The Board's 2023 ACE Plan Order directed NS Power as follows:

> 7) Continue to provide examples of cost minimization efforts over the previous year in future ACE Plan applications as directed in Paragraph [122] of the decision.
>
> 8) To incorporate the following into future post-project reviews:

i) A comparison of actual final project costs, labour hours, and schedule to the planning estimates used in the related ACE Plan submissions.

ii) More explicit identification of whether a project has fully met its objective, or whether further requirements were identified during the project planning and implementation phases that required additional projects.

iii) More explicit sections on follow-up surveys or discussions with external stakeholders about the degree to which a project met their expectations.

iv) Identification of the trigger that required the need for the post-project review.

[179] Paragraph 122 of the Board's 2023 ACE Plan Decision stated:

> [122] In its application, NS Power noted that as its cost minimization efforts are shared, considered, and actively included in the budgeting process for future capital projects, this will likely result in diminishing opportunities to further reduce costs for similar projects going forward. As such, this may result in fewer or less impactful examples of cost minimization as the Company continues to track this information. The Board agrees with this assertion. However, the Board continues to find the cost minimization examples and related supporting information provided by NS Power to be useful and informative, and it remains important to track. As such, the Board directs NS Power to continue to provide such information in subsequent ACE Plan applications, per Directive 3 of the Board's 2022 ACE Plan Order. Further, the Board encourages NS Power to incorporate its cost minimization successes into future capital project planning to ensure improvements in cost minimization, schedule adherence, and risk management.

[180] The cost minimization information associated with Directive 3 from the Board's 2023 ACE Plan Order is to include specific examples of cost minimization practices used during the execution and construction of the prior year's projects, fully describing specific cost minimization efforts, complete with a description of the cost savings accrued by these efforts. This information is to be presented in the format used in Section 11.1.5 and Appendix F of the 2022 ACE Plan application. Projects selected for inclusion in the cost minimization examples are to meet the criteria identified in NS Power's 2021 Stakeholder Engagement Report. Further, NS Power is to report on any new cost minimization techniques that it adopts.

[181] NS Power provided this information in Appendix E of its 2024 ACE Plan application. Section 11.1.4 of NS Power's 2024 ACE Plan application also summarized the capital cost minimization efforts undertaken by the Company over the past year. The

savings related to these efforts were grouped into the following categories: Design and Project Scoping; Procurement Process/Negotiated Savings; and, Project Execution/Construction Efficiencies. For each of these categories, Appendix E described specific project cost minimization examples (50 in total) that were completed to help achieve these project cost savings. The total project cost savings NS Power assigned to these efforts was roughly $4.3 million, as presented in Figure 57 of the application.

[182] NS Power's 2024 ACE Plan application stated that cost minimization is embedded into all stages of capital project development and execution. The Company also noted that it continues to follow its processes through project development and execution, leveraging resources and procurement across multiple projects to minimize costs. NS Power believes that these practices continue to be the primary means of achieving capital cost minimization, with the largest benefit of these achieved in the early stages of project planning.

[183] NS Power further stated that cost minimization expectations are included in the Company's Project Delivery Model (PDM) gated framework. The PDM serves as the overarching framework that provides guidance on documenting and sharing cost minimization expectations and practices within NS Power's business. The PDM also describes the process for the proactive review and tracking of cost minimization opportunities during all stages of the project life cycle.

[184] In the 2023 ACE Plan proceeding, NS Power said it expected the PDM to be fully implemented in October 2023. In the 2023 ACE Plan Decision, the Board said it expected "…NS Power to have its comprehensive PDM ready for review by the Board and the parties in the 2024 ACE Plan proceeding."

[185] NS Power included a section on the PDM in the 2024 ACE Plan. The Company rolled out the full PDM to employees who are responsible for capital filings in October 2023. The PDM has a base set of requirements for all capital projects, consistent with current templates for capital approval requests before the Board. The PDM envisages additional elements, to ensure proper management and governance, depending on the nature of the project.

[186] Responsible NS Power employees must assess whether the project involves an asset whose condition is unknown, whether there has been a wide range of outcomes for similar projects in the past, whether a new asset is being built, whether new technology is being installed and whether the project involves a method NS Power has not previously used. If the project involves any of these unique elements, there must be a discussion with NS Power's Capital Planning to decide if, and what, additional PDM elements are needed. This will depend on the complexity of the project and risk associated with it. This is often dependent on the scale and cost of the project. Also, NS Power expects new projects may arise that do not fit into the above analysis. PDM evolution is expected as it is implemented.

[187] Potential additional PDM elements, where warranted, include such things as project inception forms, project charters, costing workbooks, contracting strategies, risk and issue registers, stage gate summary checklists and presentations, project closeout processes, and post project reviews.

[188] The 2024 ACE Plan application identified some general guidelines describing how NS Power will use the PDM through the life cycle of capital projects. In particular, the Company noted that the size and scale of a capital project may not warrant all the

requirements of the PDM. Therefore, as new projects arise that may not fit into the PDM guidelines, the method of determining the required deliverables will be updated. NS Power expects this determination process to evolve over the first one to two years of the PDM implementation, as the requirements on smaller, less complex projects are reviewed, so that only value-added requirements are put in place.

[189] In response to NSUARB IR-91, NS Power also provided a copy of its October 2023 PDM roll-out presentation. The presentation described the purpose of the PDM and its core elements. In addition, in response to the CA's IR-5, NS Power provided copies of its PDM templates. The Company noted that the templates are provided to project managers for ease of use but can be changed by the project managers as needed to best fit the associated project, as long as they still meet the intended requirements of the PDM. NS Power also stated that it now considers development of its PDM to be complete, apart from any updates and improvements over time.

[190] As it relates to NS Power's project cost minimization efforts, Mr. Wilson stated:

> In both the 2023 and 2024 ACE Plan proceedings, NS Power has provided cost minimization examples and post-project reviews that show serious consideration to recognizing or identifying opportunities for improvement. In comparison to information provided in prior to the 2023 ACE Plan proceeding, this information appears much more specific and actionable (capable of being replicated in future projects).
>
> …
>
> …for the most part, the cost minimization activities reflect specific, proactive initiative or deviation from initial plans to achieve a more cost-effective result, with some of the activities appearing to be replicable in future projects.
>
> [Exhibit N-15, p. 51]

[191] Mr. Wilson's evidence also stated that all elements of NS Power's PDM implementation appear to have been completed and rolled-out to project management staff. He further stated that the PDM material is very thorough and should provide a degree of consistency and accountability around issues that have previously been

identified as problematic in executing certain projects. Mr. Wilson also believes that NS Power has fully addressed the commitment it made in the 2021 ACE Plan stakeholder engagement process to, as the Board summarized it, “review and update its project management guidance documentation and practices, which includes cost minimization elements.”

[192] Mr. Wilson did, however, express concerns about potential quality control issues related to implementation of NS Power’s PDM. He, therefore, recommended that the Board direct NS Power to revise its PDM to include a quality control step to verify that maturity matrices, risk registers, and other relevant documents are accurate and have been appropriately relied upon in reaching relevant conclusions. He further noted that this additional review should be implemented with the objective of ensuring that projects are correctly managed with cost minimization objectives in mind.

[193] Mr. Wilson also took issue with how NS Power is using its post-project reviews to assist in project cost minimization efforts. Specifically, he identified what he believes to be the following post-project review shortcomings:

- No discussion of internal coordination practices, including whether they were effective, efficient, or problematic.
- No discussion of project risk registers, including identifications of risks that were overlooked, overstated, or successfully mitigated.
- Little or no discussion of whether staff responded to emerging problems with effective internal communication and took mid-course action to mitigate the problems. [Exhibit N-15, p.55]

Mr. Wilson also noted that it is unclear whether NS Power is effectively capturing and putting into practice lessons learned from its cost minimization efforts and post-project reviews.

[194] As such, Mr. Wilson recommended that NS Power revise its post-project review practices to include the following:

- Review of internal project coordination practices, including whether they were effective, efficient, or problematic;
- Review of project risk registers, including identifications of risks that were overlooked, overstated, or successfully mitigated; and
- Review of staff response to emerging problems, such as whether internal communication was effective and whether mid-course action mitigated those problems.

[Exhibit N-15, p.56]

He also recommended that cost minimization reporting in future ACE plans include reporting on post-project review actionable recommendations.

2.7.2.1 Findings

[195] The Board finds that the examples provided in Appendix E of the 2024 ACE Plan application provide clear evidence of the continued effort by NS Power to minimize costs during capital project execution. The Board also agrees with Mr. Wilson that these examples show serious consideration to identifying opportunities for cost minimization. Further, in comparison to information provided prior to the 2023 ACE Plan proceeding, this information appears much more specific and actionable. The Board acknowledges the continued efforts by NS Power to provide more relevant and meaningful examples of cost minimization through all phases of capital project execution.

[196] In its application, NS Power noted that since its cost minimization efforts are actively included in its budgeting process for future capital projects, this will likely result in diminishing opportunities to further reduce costs for similar projects going forward. As such, this may result in fewer or less impactful examples of cost minimization as the Company continues to track this information. The Board agrees with this assertion.

However, the Board continues to find the cost minimization examples and related supporting information provided by NS Power to be useful and informative, and it remains important to track. As such, the Board directs NS Power to continue to provide such information in subsequent ACE Plan applications, per Directive 7 of the Board's 2023 ACE Plan Order. Further, the Board continues to encourage NS Power to incorporate its cost minimization successes into future capital project planning to ensure improvements in cost minimization, schedule adherence, and risk management.

[197] In response to the expectations outlined in the Board's 2023 ACE Plan Decision, NS Power filed detailed information about its PDM in its 2024 ACE Plan application. Based on the Board's review of this material, the Board finds the development of NS Power's PDM now appears to be complete, except for any updates and improvements over time. The Board also agrees with Mr. Wilson that the PDM material appears thorough and will provide a degree of consistency and accountability around issues that have previously been identified as problematic. The Board is satisfied that the PDM contains processes and guidelines that provide NS Power employees with the tools to assess what types of project controls and management should be in place at various decision gates. The goal is to have a consistent framework to achieve cost minimization strategies at the appropriate times.

[198] This notwithstanding, in its Rebuttal Evidence, NS Power agreed to address Mr. Wilson's concern related to quality control in the PDM. The Board, therefore, directs NS Power to revise its PDM to include a quality control step to verify that maturity matrices, risk registers, and other relevant documents are accurate and have been appropriately relied upon in reaching relevant conclusions. In its 2025 ACE Plan

application, the Company is further directed to describe this quality control measure and explain how it will be used and managed internally.

[199] The Board also notes that in implementing its PDM, NS Power is not applying all PDM requirements to all capital projects. The Company noted that the majority of capital projects do not have a level of complexity and/or risk where completing all of the PDM requirements would provide value to that specific project or other projects in general. For these projects, NS Power does not consider it appropriate to utilize resources to complete work that will not add value. Because of this, NS Power does not intend to require the application of all PDM requirements to all capital projects. The Board does not take issue with this approach. However, while the majority of projects will not use all the PDM requirements, the Board expects the tracking of cost minimization efforts to remain a PDM requirement that will be applied to all capital projects.

[200] In response to the CA's IR-3, NS Power describes its post-project review process. Further, in response to NSUARB IR-9, the Company provided examples of some recently completed post-project review documentation. Upon reviewing this material, the Board agrees with Mr. Wilson that this material identifies opportunities for improvement in delivering capital projects and is an improvement over similar material provided in the 2023 ACE Plan proceeding.

[201] In the Board's 2023 ACE Plan Order, NS Power was directed to include the following information in its post-project reviews:

- A comparison of actual final project costs, labour hours, and schedule to the planning estimates used in the related ACE Plan submissions.
- More explicit identification of whether a project has fully met its objective, or whether further requirements were identified during the project planning and implementation phases that required additional projects.

- More explicit sections on follow-up surveys or discussions with external stakeholders about the degree to which a project met their expectations.
- Identification of the trigger that required the need for the post-project review.

The Board finds that the material provided in response to the CA's IR-3 and NSUARB IR-9 shows that NS Power has complied with these directives.

[202] The Board has also reviewed Mr. Wilson's concerns about the Company's post-project reviews. With regards to his recommendation that cost minimization reporting in future ACE plans include reporting on post-project review actionable recommendations, NS Power noted that its post-project reviews are currently reviewed by its Capital Planning team. If actionable recommendations from these reviews warrant further discussion or broader communication to the benefit of other capital projects, the Capital Planning team includes them for discussion as part of standing bi-weekly capital planning meetings with project leads and managers. Therefore, NS Power does not consider the development of a lessons learned register for actionable recommendations that are included in post-project reviews to be necessary. The Board finds that this process adequately addresses Mr. Wilson's concern. As such, the Board agrees with NS Power that it is not necessary to implement Mr. Wilson's recommendation.

[203] Concerning Mr. Wilson's other recommendations related to revising NS Power's post-project review practices, NS Power agreed that the issues these recommendations are intended to address are important. However, the Company stated that the existing post-project review template includes sections for discussion of internal project coordination practices, risk register considerations, and staff response to emerging issues (including adjustments to project plans and budgets and key lessons learned). The Company, therefore, submitted that no action is required for Mr. Wilson's

recommendation. Nonetheless, NS Power indicated that it would amend its post-project review documentation accordingly if directed by the Board. The Board finds this unnecessary. Based on its review, the Board believes that the existing post-project review template adequately addresses the issues raised by Mr. Wilson. Regardless, there is always room for improvement, and NS Power is encouraged to update its post-project review practices when potential improvements are identified.

2.8 Contingency and Contingency Guidelines

[204] Directive 7 of the Board's 2020 ACE Plan Order directed NS Power to develop non-binding contingency guidelines "…describing how it determines when a capital cost estimate contingency amount is merited and at what level… ." The Company issued the Non-Binding Contingency Guidelines (Contingency Guidelines) on November 20, 2020, and revised them on August 31, 2021. These Contingency Guidelines have been a point of review and discussion in subsequent ACE Plan proceedings.

[205] The Board's 2023 ACE Plan Order directed NS Power to engage with stakeholders to develop a better understanding of what additional contingency detail can be provided with capital work order applications, while still allowing for an appropriate balance between transparency and regulatory efficiency. This stakeholder engagement was to occur before the submission of the 2024 ACE Plan application to the Board.

[206] On October 30, 2023, NS Power held an engagement session with the CA, Industrial Group, SBA, NRR, and Board staff as invitees. The presentation to stakeholders from this session is contained in Appendix F of the 2024 ACE Plan application. At this session, NS Power provided an overview of its current approach to providing contingency information in capital work orders and solicited feedback from

attendees. The Company also provided written follow-up after the session, outlining proposed changes based on engagement session feedback from stakeholders.

[207] During the engagement session, Mr. Wilson asked NS Power to summarize the changes made in providing contingency information in capital work orders since the 2022 ACE Plan. NS Power responded that further detail has since been provided in the commentary of the project maturity matrix. Mr. Wilson subsequently requested that additional information on risk and the way the contingency percentage within a range is selected be provided, clarifying that he is seeking qualitative rather than quantitative information in this regard. NS Power confirmed that it is willing to expand on this and provide further qualitative information. In its written follow-up, the Company provided examples of the proposed addition to Note 3 of the capital cost estimates intended to address this issue.

[208] In a letter responding to NS Power's written follow-up, the CA advised that the proposed amendments to Note 3 satisfactorily address many of Mr. Wilson's concerns. However, the CA noted that it does not believe the Note 3 format will work well for projects with civil works, projects that include substantial uncertainty with site conditions, or projects where NS Power lacks sufficient background to rely on past experience in assessing project risks.

[209] NS Power agreed to incorporate the CA's additional concerns into future contingency information. To incorporate this feedback, NS Power has included an enhanced Note 3 in 2024 ACE Plan projects submitted for approval. Due to time constraints, however, NS Power did not change the Note 3 approach for the 2024 ACE Plan but is generally amenable to including a separate contingency statement in the

project description page instead of using Note 3 for this purpose. The Company is not opposed to updating its Non-Binding Contingency Guidelines to reflect the changes discussed. Further, if the Board determines that the Non-Binding Contingency Guidelines should be updated, NS Power suggested it be done as a directive associated with the 2024 ACE Plan.

[210] In its IR-4 in the current proceeding, the CA asked NS Power to identify a list of changes the Company believes would be appropriate in an update to the Non-Binding Contingency Guidelines. In response, NS Power stated:

> Changes are not required to the Non-Binding Contingency Guidelines (Guidelines) at this time. The Guidelines provide a high-level framework for how contingency is estimated, and when it should be applied, but do not prescribe the format or detail to be provided in capital work orders. Rather, consistent with the stakeholder engagement sessions held in the Fall of 2023, NS Power intends to include additional detail on the specific risks that are being considered as part of the contingency allocation, as well as a reference to similar projects that have been completed and are used in determining the percentage contingency to be applied. These two items are in addition to the expansion of the commentary within the Maturity Matrix.
>
> [Exhibit N-5, Response to IR-4(a)]

The Company also stated that as part of a separate contingency statement in capital work order applications, it is amenable to including information currently in Note 3 of the project detailed cost estimate, as well as referencing similar projects used to determine contingency and the specific risks that were considered as part of the contingency determination.

[211] In his evidence, Mr. Wilson stated that compared to the 2023 ACE Plan, the 2024 ACE Plan shows substantial improvement in the specificity of evidence to support the amounts identified for capital project contingency budgets. He did, however, identify constraints associated with providing contingency-related information in Note 3 of project detailed cost estimates. He, therefore, recommended that the Board endorse NS Power's

offer to provide separate contingency statements in the description page of future capital work order applications.

2.8.1 Findings

[212] The Board agrees with Mr. Wilson's recommendation. Therefore, the Board directs NS Power to include a separate contingency statement in the description page of its capital work order applications instead of using Note 3 in the detailed cost estimate. NS Power is directed to begin using this approach in its 2025 ACE Plan application.

3.0 SUMMARY

[213] The Board approves NS Power's 2024 ACE Plan. The approved projects are listed in the attached Schedule A. The Board has amended the approval for Routine D004 New Customer Upgrades. The revised approved amount for this routine is $8,563,623. The Board, therefore, approves NS Power's 2024 Routine Capital Expenditures in the amount of $151,858,720.

[214] The Board has provided comments on vegetation management, reliability and resiliency, NS Power's plan to meet the legislated goals of phasing out coal-fired generating plants and achieving 80% of electricity sales from renewable resources by 2030, the Mersey Hydro System, cost minimization, and contingency matters.

[215] The Board has the following directives in this matter:

1. The Board directs NS Power to file the CEATI report upon receipt.
2. The Board directs NS Power to consider the issue of developing better metrics and analysis to evaluate the cost-effectiveness of resiliency investments. These should be capable of both quantifying the expected benefits of a resiliency investment and measuring the effectiveness of that specific intervention once it is in place. NS Power is to provide this report to the Board in its 2025 ACE Plan application.

3. The Board directs NS Power to continue to study the issue of Normalized SAIDI and provide further information about potential alternatives to the manner in which Normalized SAIDI is presented, in the 2025 ACE Plan.

4. The Board directs NS Power to consider if there are alternative metrics to assess investments to address reliability in the context of proposed capital expenditures, and report back to the Board in the 2025 ACE Plan.

5. The Board directs that NS Power file an update on *The Path to 2030* in the ACE Plan on an annual basis until 2030.

6. In its next depreciation study to be filed with the Board, NS Power is directed to include an updated capital cost estimate for the Mersey decommissioning option, complete with all assumptions used to develop the estimate. Further, after filing its depreciation study, NS Power is directed to also include an NPV analysis comparing the decommissioning option to the redevelopment option, complete with a description of all assumptions used in the analysis in its subsequent ACE Plan application.

7. The Board directs NS Power to once again provide a comprehensive update on the Mersey Hydro System Redevelopment Project in its 2025 ACE Plan.

8. The Board directs NS Power to continue to track the information noted in Paragraph 92 of the Board's 2020 ACE Plan decision for each completed capital project that was submitted for Board approval in 2017, 2018, 2019, 2020, 2021, 2022, 2023 and 2024 (either through or outside of the ACE Plan proceedings, including projects submitted for subsequent approval, but excluding U&U projects). Further the Board directs that the following information be included in the related 2025 ACE Plan reporting:

    a) Identification of all new projects that have been added to the Contingency Report (Appendix D);

    b) A summary table of Contingency Report (Appendix D) data, similar to Figure 90 in the 2024 ACE Plan application, organized by the year projects were placed in service;

    c) A summary table of Contingency Report (Appendix D) data, similar to NS Power's response to Figure 91 in the 2024 ACE Plan application, organized by the year projects were submitted for Board approval; and

    d) For any capital projects in the Contingency Report (Appendix D) that have a negative variance greater than or equal to 25% of the Board approved capital cost estimate, NS Power is to provide an explanation detailing the reasons for the variance.

The Board directs NS Power to continue to track this information, including information related to projects approved by the Board after 2024, and report it in future ACE Plan applications. The Board directs that the data continue to be presented in the 2024 ACE Plan application Appendix D format in future ACE Plan applications. This reporting is to also categorize projects by function (i.e., generation, transmission, distribution, and general plant), with "generation" projects further categorized by type of project (i.e., hydro, steam, gas, other renewables).

9. The Board directs NS Power to revise its PDM to include a quality control step to verify that maturity matrices, risk registers, and other relevant documents are accurate and have been appropriately relied upon in reaching relevant conclusions. In its 2025 ACE Plan application, the Company is further directed to describe this quality control measure and explain how it will be used and managed internally.

10. The Board directs NS Power to include a separate contingency statement in the description page of its capital work order applications instead of using Note 3 in the detailed cost estimate. NS Power is directed to begin using this approach in its 2025 ACE Plan application.

[216] An Order has already been issued approving the 2024 ACE Plan. An Order incorporating the amendment to the 2024 Routine Capital Expenditures and the directives in this decision will be issued accordingly.

DATED at Halifax, Nova Scotia, this 13th day of August, 2024.

Richard J. Melanson

Steven M. Murphy

Jennifer L. Nicholson

SCHEDULE "A" 2024 ACE Plan Approved Projects			
CI Number	**Title**	**2024 Budget**	**Project Total**
Generation			
C0006418	HYD WRC Tailrace Tunnel Rock Bolting Phase 2	$1,025,340	$15,722,669
C0049032	HYD - Cowie Falls Log Hoist Replacement	$1,401,150	$2,237,991
C0049013	HYD – Lower Great Brook Log Hoist Replacement	$1,370,432	$2,158,658
C0058942	WRC D11-2 Foundation Stabilization	$1,474,856	$1,540,602
C0051136	TUC2 – HP/IP Turbine Refurbishment	$3,760,671	$4,264,777
C0060608	TUC6 Turbine Refurbishment	$552,211	$2,472,311
C0041050	LIN 824 Wheeled Dozer Replacement	$1,607,862	$1,607,862
C0060707	CT BGT1 Generator Refurbishment	$752,355	$3,482,602
Transmission			
C0061550	L5031 Replacements and Upgrades - Hubbards to East Chester	$1,079,792	$5,297,584
C0061545	L6006 Replacements and Upgrades	$612,375	$5,032,640
C0061023	2024 EHV Breaker Replacements	$279,566	$3,638,480
C0061551	L7009 Replacements and Upgrades	$858,295	$3,280,328
C0050842	2024 Bulk Oil Breaker Replacement Program	$3,210,019	$3,274,756
C0056240	2024/2025 Transmission Switch and Breaker Replacements	$1,381,836	$3,271,622
C0061403	2024 2025 Sacrificial Anode Installation Program	$645,679	$2,382,113
C0061547	L7022 Replacements and Upgrades	$506,944	$2,283,569
C0057882	2024 Pennsylvania Breaker Replacements	$1,879,371	$2,163,832
C0061546	L6514 Replacements and Upgrades	$256,661	$2,102,666
C0059046	101S and 79N Reactor Replacements	$1,335,523	$1,460,062
C0061387	2024 2025 Wood Pole Retreatment Program	$333,221	$1,209,391
C0061046	2024 Merlin Gerin Breaker Replacements	$914,905	$1,169,591
C0061743	L6038 Realignment	$917,669	$1,032,911
C0061883	129H - Kearney Lake Substation Rebuild	$938,071	$1,017,322
Distribution			
C0057142	New Distribution Rights-of-Way Phase 9	$17,480,999	$19,141,914
C0060749	2024 Padmount Replacement Program	$911,994	$1,288,198

General Plant			
C0049619	IT - ERP Upgrade (EBS, PS, PP, OBIA)	$2,868,321	$6,198,799
C0047277	IT - GIS Utility Network Migration	$2,496,217	$6,175,230
TOTAL APPROVED AMOUNT		**$50,852,335**	**$104,908,481**