DECISION **2023 NSUARB 222**
M11082

NOVA SCOTIA UTILITY AND REVIEW BOARD

IN THE MATTER OF THE PUBLIC UTILITIES ACT

- and -

IN THE MATTER OF AN APPLICATION by **THE TOWN OF ANTIGONISH, on behalf of its ELECTRIC UTILITY**, for approval of a Grid Modernization and New Substation Project in the amount of $19,399,240.25

BEFORE:	Richard J. Melanson, LL.B., Panel Chair Steven M. Murphy, MBA, P.Eng., Member Bruce H. Fisher, MPA, CPA, CMA, Member
APPLICANT:	**TOWN OF ANTIGONISH ELECTRIC UTILITY** Melanie Gillis, Counsel James MacDuff, Counsell
INTERVENORS:	**NOVA SCOTIA POWER INC.** Mollie Morris, Counsel **EFFICIENCYONE** (not appearing)
BOARD COUNSEL:	William L. Mahody, K.C.
HEARING DATE:	September 27, 2023
FINAL SUBMISSIONS:	October 25, 2023
DECISION DATE:	**December 15, 2023**
DECISION:	**The application is approved.**

I INTRODUCTION

[1] The Town of Antigonish is a vibrant university town that wants to be the first net-zero emissions community in Canada. The Town is working on a proposed solar garden and advancing a feasibility assessment of a Community District Energy System with Saint Francis Xavier University (StFX). It is projecting several decarbonization initiatives. Electrification, backed by renewable energy, is a crucial component of the decarbonization initiatives. The Town owns a municipal electric utility. The utility has approximately 3,500 customers. The Town says that electrification, along with projected population growth and new development, will increase the demands on the utility's electric grid.

[2] The utility's electric grid also faces reliability issues, primarily related to the configuration of the power lines and substations that feed the utility's grid. The grid is indirectly served by two NS Power transmission lines which feed a NS Power substation located on Lochaber Road. This substation supplies three NS Power 25kV circuits that encircle Antigonish in wooded areas. The utility has six grid interconnections or metering points, including four substations, connecting the Town to NS Power's electrical grid. Because of the location of the transmission lines, frequent high winds caused by climate change leave the Town vulnerable to lengthy power outages from treefalls.

[3] The utility proposes to address both the projected increased electrical load brought on by potential decarbonization and development, and grid reliability issues. It says this can be accomplished by modernizing its electric grid. The utility proposes to do this in three phases:

- Phase I involves developing a new substation and meter at 58 Market Street to consolidate provincial grid interconnections. This would involve installing four new

25kV circuits supplied by the new substation. The distribution circuits would be upgraded to 25kV and connected to the four new 25kV circuits.

- Phase II involves modifying an existing substation (known as 8C) to accommodate more load and allow for grid reconfiguration.
- Phase III involves deploying customer smart meters to assist with demand-side management initiatives.

[4] Any capital project costing more than $250,000, for this utility, must be approved by the Board. In this matter, the utility seeks our approval to spend $19,399,240.25, over six years, to complete all three phases of the grid modernization project. The federal government has determined that the proposed project is consistent with a federal electric grid decarbonization program. The federal government has, therefore, approved funding for 50% of the estimated project costs, or $9,699,620. To get this federal funding, the utility requires our approval by December 23, 2023.

[5] The utility projected in its initial application that the grid modernization project would result in upward pressure on rates of 3.32% and 5.30% by rate class. This estimate accounts only for the estimated project costs, and not the full rate impacts that might arise in a general rate application. Of course, when rates are considered in a general rate application, all costs to provide service are reviewed. We also note that the utility currently has an accumulated surplus of more than $2 million. The use of money from this account to pay for the grid modernization project helps alleviate some of the rate pressures.

[6] We must determine if the amount requested in the application is necessary and justified, in the sense that the expenditure is reasonable and prudent. In this case, our decision turns on the answer to two main questions. The first question is whether the grid modernization project is required now. If so, the second question is whether the utility has chosen the least-cost alternative to achieve its grid modernization goal. We are

satisfied that the utility has established, on a balance of probabilities, that the answer to both these questions is yes. We will explain why.

II IS GRID MODERNIZATION REQUIRED NOW?

[7] The utility's application focused on the need to meet legislative environmental requirements. The utility referred to s. 6(b) of the *Environmental Goals and Climate Change Reduction Act*. This legislation sets a provincial target of achieving net-zero carbon emissions by 2050 across all sectors. Compliance with s.6B(1) of the *Renewable Electricity Regulations* requires at least 80% of all electricity supplied by the utility be renewable energy. Finally, the utility pointed to federal efforts to attain net-zero carbon emissions in the electricity sector by 2035.

[8] The utility provided more detail about what carbon reduction initiatives would be enabled by grid modernization. These included: enabling StFX to convert from a fossil-fuel based heating system to electricity; enabling customers to convert to electric heat pumps and electric vehicles; providing customers with more data so they can manage their electrical consumption; and enabling potentially larger renewable energy projects and battery storage. The utility pointed specifically to the restrictions on the current size of their proposed solar garden because of the current grid configuration. The utility also discussed a potential district energy heating system based on electricity. It said the potential StFX project, along with deep energy retrofits of the Town's own infrastructure, could anchor the district energy system. The utility said these decarbonization initiatives could not be accommodated with the current grid.

[9] The utility emphasized three residential developments as another potential source of load growth. A project known as Nova Landing is currently under development. Another is known as Crockett Farm which was described as “being in the hopper.” There is also a potential for development near Saint Martha’s Hospital.

[10] Board Counsel retained an expert to review this application. Robert Griesbach, MBA. P.Eng., is a senior energy consultant with Hatch Inc. He has over 40 years of experience. Mr. Griesbach provided a valuable independent assessment of the proposed grid modernization project. He expressed concerns about the lack of detail about the carbon reduction initiatives and the utility’s future growth projections in its pre-filed evidence.

[11] Mr. Griesbach also pointed out that NS Power is subject to all the same legislative requirements as the utility. Any power purchased from that source would have to be compliant with any applicable legislation. Also, the utility obtains electricity from the Alternative Resource Energy Authority (AREA). Eighty-four percent of the electricity AREA currently supplies customers comes from renewable sources. Mr. Griesbach’s opinion was that the utility had not justified the proposed expenditure, based on the lack of detail in the application about the carbon reduction initiatives and load growth that might require grid modernization.

[12] The utility’s heat pump and electric vehicle (EV) penetration rates assumptions were derived from projections in NS Power’s Integrated Resource Plan and 10-year System Outlook. While perhaps not directly applicable to the specific circumstances of the Town, we would consider this an appropriate source to provide reasonable projections for use by a small utility with more limited means. That said, the proposed StFX project

and the district energy project are in the initial discussion and feasibility stages. While heat pump uptake is making progress, EVs remain a small percentage of vehicles sold in Nova Scotia.

[13] In addition, the federal objectives discussed by the utility have not yet been finalized. The *Environmental Goals and Climate Change Reduction Act* sets goals but not a mandatory compliance regime. Electricity from at least 80% renewable sources by 2030 is mandated by the *Renewable Electricity Regulations*.

[14] This raises interesting and difficult considerations when the *Public Utilities Act* is currently based on a traditional cost of service model. A utility is ordinarily asked to prove the need with sufficient certainty to justify the cost of a project being passed on to ratepayers. The proposed grid modernization project would likely allow the utility to address all the carbon reduction initiatives and projects discussed in the application. As well, given the pace of change required for electrical systems, it is likely some flexibility in the timing of proposed projects will be required.

[15] The utility said the traditional Bonbright's Principles that apply to capital approvals in terms of the least-cost option to ratepayers must be applied in the current context. This context includes uncertainty in forecasting. We note the applicable legislation has short-term, medium-term and long-term time horizons. Goals could shift over time. Currently, the need to have 80% renewable energy in the electricity sector is the only mandatory obligation for the utility in the decarbonization framework. The uncertainty of long forecast periods makes capital planning difficult and risky. This is why, as submitted by the utility, pursuing government funding from all sources, to relieve

ratepayers from some financial burdens imposed by necessary government policy, is important.

[16] In the end, however, these issues need not be resolved in this matter because this application can be considered under the traditional cost of service model principles. This is because, in addition to all the potential carbon reduction benefits grid modernization will enable, this project can also answer the reliability needs of the utility. The utility has made it clear that reliability concerns must be addressed, and some form of grid modernization is required.

[17] A Business-as-Usual scenario was used as an alternative when assessing whether the proposed grid modernization project was the least cost option. That scenario also has a grid modernization component but is less ambitious than the project the utility wants us to approve. The utility says the Business-as-Usual scenario would address some grid reliability concerns, but not a grid configuration issue which is most significant. It would not allow the full suite of decarbonization initiatives the Town wants to undertake. The reliability issue was addressed to some extent in the pre-filed evidence. It was more fully canvased during the hearing.

[18] During the hearing, a major focus of discussion with the utility panel was about how the configuration of the NS Power grid feeding the utility impacted reliability. The 25kV lines which encircle the Town are almost entirely in wooded areas. This part of the system was built in 1958. If one or more of the NS Power 25kV lines encircling the Town go down during a storm, it can cause power outages throughout the Town. If this happens, the Town's system becomes part of NS Power's larger storm recovery efforts.

Utility staff cannot make repairs on the NS Power system. The Town has experienced significant power restoration delays in this context.

[19] The proposed grid modernization project contemplates a utility-owned substation taking power directly from NS Power's 138kv transmission line. The electricity will then be routed through an easily accessible distribution system within the Town. The Business-as-Usual scenario would still have existing grid configuration issues. The utility points out that the downtime for 138kV transmission lines is negligible compared to the time it sometimes takes to repair a series of 25Kv power lines. Without being critical of NS Power, the utility said the grid modernization project would allow utility staff to quickly do troubleshooting on its own system. Resources within the Town could then be efficiently dispatched. The utility pointed to some redundancies that it could control in the proposed system, such as transformers. This could assist in emergencies. The utility is also confident that it has sufficient trained personnel to respond to outages in a reasonable manner.

[20] The utility said that the proposed grid configuration was also designed so a power line to the Glen Dhu Wind Farm could be isolated. The possibility of providing loop feeds would assist with grid resiliency. As well, there are more resiliencies built in for Saint Martha's Hospital. The fact the Town would now only be served by one substation did not raise any concerns because of the proven reliability of substations. The proposed substation would not be prone to the same vegetation management issues as power lines.

[21] After hearing the evidence at the hearing, Mr. Griesbach still had some residual concerns about the utility taking on the grid modernization project. That said, concerning

the reliability aspects, he made the following comments in response to a question from a Board Member:

> Q. [Murphy] Would you agree that this is a good start, though?
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> A. Absolutely, yeah. It's very good. And I think it became -- certainly became a lot clearer to me today with the discussions and the illustration on the map of some of the realities that maybe don't come across so well in the written material, but I think that's a very good start for sure.
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> [Transcript, pp. 334-335]

[22] Mr. Griesbach said that an important positive factor was the replacement of equipment with reliability issues. Mr. Griesbach was not necessarily convinced the utility should take over the substation from NS Power. He said it would not be his first choice, but Nova Scotia Power keeping ownership of the substation was not clearly superior. He said if the utility was comfortable with taking on this responsibility, he was not opposed to it.

[23] Properly resourced, we are satisfied that grid modernization is required to enhance grid reliability. While the application had focussed on a winter peaking capacity issue, the full hearing led us to the conclusion that there are wider issues that need to be addressed. The grid modernization project will bypass the existing 25kV lines which are in wooded areas. The project will also allow electricity to flow to the Town through an upgraded system. It should not have the same exposure to outages where the whole town is impacted by events on the 25kV lines. The grid modernization project should allow the utility to monitor the system more closely. The utility should also be able to respond to problems in a more efficient and timely manner. It will allow for greater resiliency.

[24] The amount and timing of future load increases is still difficult to assess; however, it is probable that electrification and growth will result in significant load

increases at some stage. In any event, we find that grid modernization is needed to address immediate concerns. We will now consider whether the proposed grid modernization project is the least-cost option for ratepayers.

III HAS THE UTILITY JUSTIFIED THE COST OF THE CHOSEN OPTION FOR GRID MODERNIZATION?

[25] The utility did a Net Present Value (NPV) economic comparison between the proposed grid modernization project and the Business-as-Usual scenario. The Business-as-Usual scenario "…assumes the upgrade of the Town of Antigonish's distribution circuit voltages to 25kV, and the transformer additions/replacements in the NS Power substations (4C, 6C, 7C and 8C) to serve the Town of Antigonish." As outlined previously, the proposed grid modernization project involves developing a new substation, modifying an existing substation, and installing smart meters.

[26] The NPV analysis filed with the application showed a differential of almost $3.5 million in favour of the proposed grid modernization. Mr. Griesbach expressed concerns about some of the Phase I and Phase II cost estimates. We explored the proposed grid modernization cost estimates in some detail at the hearing. We requested a series of undertakings from the utility focused on the amount allowed for contingency, depreciation amounts, potential amounts owed to NS Power for retiring assets, aligning the start of debt repayments with Municipal Finance Corporation debenture funding, and including short term financing to align with revised budget estimates.

[27] Mr. Griesbach had offered a general opinion that some of the cost estimates in the original NPV analysis appeared low and may not have included all potential costs. The revised estimates and inputs provided by the utility as undertakings indicate a

projected cost of $21,918,949 for the grid modernization project. The most significant factor in the increased estimates is a more robust contingency analysis-based on Association for the Advancement of Cost Engineering class estimates. As well, the utility is committed to a rigorous procurement process. It was in the final stages of retaining a project manager through a competitive RFP. We are, therefore, satisfied that the revised cost estimates form a reasonable basis for assessing the application.

[28] The utility provided updated NPV calculations for both the proposed grid modernization project and the Business-as-Usual scenario. These incorporated the additional cost analysis provided in the undertakings for both scenarios, where applicable. The NPV differential now shows a differential in favour of the proposed grid modernization project of only $356,202. This is a small positive differential for a project of this magnitude. A change in one or more of the underlying assumptions could result in the Business-as-Usual option being the least-cost-option when looking at the reliability concerns. That said, we consider it likely that any potential cost increases will impact both the project and the Business-as-Usual scenarios. Hence, we consider it appropriate to approve this application.

[29] The estimated costs of the alternatives reviewed in this application are similar. The proposed grid modernization project is clearly superior when looking at accommodating future decarbonization efforts. Because of this, it qualifies for federal funding under the *Smart Renewables and Electrification Pathways Program, Grid Modernization Stream*. The Business-as-Usual scenario likely does not. Absent the federal funding, the proposed grid modernization project would likely not be affordable for the utility. A grid modernization project beyond the Business-as-Usual scenario may well

be needed at some point in the future, even though there is some uncertainty surrounding exactly how the utility's load will take shape. The federal funding spreads the costs and risks, of the grid modernization project, to a much larger base than the limited number of utility ratepayers. It is available now. There is no guarantee it will be available later. We consider this a relevant consideration, although not what ultimately led to our determination.

[30] Phase I and Phase II of the proposed grid modernization, and the soundness of the related cost estimates, generated the most questioning during the hearing process. Phase III proposes the installation of smart meters. Mr. Griesbach was satisfied the cost figures for the smart meter program appeared reasonable. The smart meter program will not generate major cost savings. Its purpose is primarily to assist in monitoring the system and help customers understand their power usage.

[31] We are satisfied that a more modern electricity grid, that envisions increased load, wind integration, and significant battery storage, will require smart meter technology. With increased electrification, customers should know as much as possible about their energy consumption. We have approved smart meter technology, in one form or another, for several water utilities with smaller customer bases. We approve the smart meters as a necessary part of the proposed grid modernization project.

[32] We conclude our analysis by addressing two points raised by NS Power. The company was an Intervenor in this matter. NS Power requested no information from the utility during the pre-hearing process. The company filed no evidence and did not cross-examine any witnesses during the hearing. In closing submissions, NS Power questioned whether some potential developments discussed in the context of the potential for future

increased load were within the utility's service boundary. NS Power also said the utility's proposed solar garden was not within the utility's service territory. NS Power expressly did not agree with some of the cost assumptions related to potential NS Power asset retirement costs included in the grid modernization project.

[33] NS Power provided no evidence on asset retirement costs. The company provided no evidence on why any of these retirement costs should be the utility's responsibility. Some the assets in question appear to serve load beyond the utility. Some might be useful elsewhere in NS Power's system. Many may be fully depreciated. The utility was left to respond to NS Power's position in Reply Submissions. We afford little weight to NS Power's submissions in this context. We are satisfied the utility provided a reasonable assessment of potential retirement costs on the record before us.

[34] The issue of whether potential future developments are within the utility's service boundary could not be explored through evidence since it was only raised after the hearing. In any event, we have relied primarily on the need for grid modernization based on reliability, and not potential load growth associated with these developments. We also note the location of the solar garden is not relevant if it is servicing load within the utility's service boundary. NS Power's submissions had no impact on this approval.

IV CONCLUSION

[35] We are satisfied that the utility's proposed grid modernization project is required to address grid reliability. We are further satisfied that, on balance, this project is marginally the least cost alternative to achieve this goal and should be approved on this

basis. We also recognize that grid modernization can assist the utility in achieving important future decarbonization goals.

[36] The cost estimates for the proposed grid modernization project were revised upwards after a full hearing. The utility did not ask that we approve a higher amount than what was set out in the application. The utility will have to use all reasonable efforts to minimize costs. We therefore approve this capital project in the amount of $19,399,240.25.

[37] An Order will issue accordingly.

DATED at Halifax, Nova Scotia, this 15th day of December, 2023.

Richard J. Melanson

Steven M. Murphy

Bruce H. Fisher