DECISION **2018 NSUARB 1**
M08224

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 capital work order CI# 50295, Electric Vehicle Charging Station Network Pilot Project, in the amount of $419,908

BEFORE:	Murray E. Doehler, CPA, CA, P.Eng., Member
APPLICANT:	**NOVA SCOTIA POWER INCORPORATED** Brian Curry, LL.B.
INTERVENORS:	**CONSUMER ADVOCATE** John Merrick, Q.C. William L. Mahody, Q.C.
	SMALL BUSINESS ADVOCATE E.A. Nelson Blackburn, Q.C.
	INDUSTRIAL GROUP Nancy G. Rubin, Q.C.
	HERITAGE GAS LIMITED Michael Johnston
	ROSWALL INC. Daniel Roscoe, P.Eng., Partner
	NOVA SCOTIA DEPARTMENT OF ENERGY Stephen T. McGrath, LL.B.
FINAL SUBMISSIONS:	November 10, 2017
DECISION DATE:	**January 4, 2018**
DECISION:	**Application is denied.**

I. INTRODUCTION

[1] On August 2, 2017, Nova Scotia Power Incorporated (NSPI or Company) submitted a request to the Nova Scotia Utility and Review Board (Board) for approval of its capital work order CI# 50295, Electric Vehicle Charging Station Network Pilot Project, in the amount of $419,908 (Application). This capital item was listed in NSPI's 2017 Annual Capital Expenditure (ACE) Plan for $400,000, as one that was not fully ready for submission at that time.

[2] The proposed project covers the purchase and installation of 12 fast charging stations for electric vehicles (EVs) at locations across Nova Scotia. NSPI states the purpose of this Pilot Project is to enable the Company to understand the impacts on its electrical system of the use of fast charging stations, which will inform future decisions to ensure grid stability as EV adoption increases.

[3] NSPI advised that its capital cost of $419,908 represents approximately 50% of the total estimated cost of $884,000 to build the proposed charging network. The remaining capital costs are funded by a grant from Natural Resources Canada (NRCan), on condition that all 12 fast charging stations are fully commissioned and open to the public by March 31, 2018, and an in-kind contribution is received from the supplier.

[4] In its covering letter, attached to the Application, NSPI also asked the Board to approve the following:

- The attached Confidentiality Undertaking, and confidential treatment of information filed in support of the Application, in accordance with Board Rule 12.
- An annual depreciation rate of 6.67 percent for these assets in order to recover the costs over the expected 15 year life of the assets.

II. REVIEW PROCESS

[5] Following an initial review of the Application, the Board approved the request for confidential treatment of certain parts and set the following timeline:

Order Issued	Thursday, August 24, 2017
Notices of Intervention	Monday, September 11, 2017
Information Requests ("IRs") to NSPI	Thursday, September 28, 2017
Responses to IRs from NSPI	Thursday, October 12, 2017
Intervenor Evidence/Submissions	Thursday, October 26, 2017
Letters of Comment	Thursday, October 26, 2017
Reply Evidence	Thursday, November 2, 2017

[6] Notices of Intervention were filed by the Small Business Advocate (SBA), the Consumer Advocate (CA), the Industrial Group, the Province of Nova Scotia - Nova Scotia Department of Energy (NSDOE), Heritage Gas Limited (Heritage Gas), and Roswall Inc. (Roswall).

[7] In its Notice of Intervention, Roswall provided support for the installation of the fast charging stations:

> Roswall Inc. is interested in encouraging energy transition in the transportation sector and therefore supports this initiative to establish important infrastructure to enable this transition. Transitioning from fossil fuels such as petroleum and diesel to the electricity system can provide significant climate benefits through emissions reductions, and economic benefits through reduction of imports and increases in productivity.
>
> We are keen to see this initiative move forward, and to help ensure that it is as cost effective and as efficient in achieving its goals as possible through our participation in this matter.

[8] IRs were issued by the Board, the SBA, Heritage Gas, and the CA.

[9] Submissions from the SBA, the CA, and, after consent, a late filing from NSDOE, were received. NSPI submitted Reply Evidence.

III. THE ISSUES

[10] The Board understands there is value in the installation of a network of EV charging stations along main highways (and probably elsewhere) in Nova Scotia. The issue is whether the proposed project is in the best interest of NSPI's ratepayers?

[11] For reasons outlined below, the Board finds the Application is not in the best interest of NSPI's ratepayers.

IV. APPLICATION - OVERVIEW AND JUSTIFICATION

1. Background

[12] EVs are classified in three main types, based on how electricity is stored and used:

- Hybrid Electric Vehicle (HEV)
- Plug-in Hybrid Electric Vehicle (PHEV)
- Battery Electric Vehicle (BEV)

[13] HEVs and PHEVs are powered by a conventional internal combustion engine and an electric motor. Their main advantage, compared with vehicles with an internal combustion engine only, is lower fuel consumption that leads to longer driving range. Energy efficiency of hybrid vehicles comes in large part from the conversion of the vehicle's kinetic energy into chemical energy (regenerative braking).

[14] PHEVs are equipped with a larger battery than HEVs, and their batteries can be recharged from the electricity grid. PHEVs use Level 1 (using a 120 volt outlet) and Level 2 (using a 240 volt outlet) type chargers.

[15] BEVs only have an electric motor, without the back-up support of an internal combustion engine. BEVs, or so called "pure EVs", are restricted by the battery to a shorter driving range than hybrids. They can use Level 1 or 2 chargers, but it takes a much longer time to fully charge than when using a Level 3 charger.

[16] NSPI is proposing to purchase and install Level 3 charging stations which are compatible with BEVs only, and cannot be used by owners of PHEVs. A Level 3 (or EV) charging station can fully charge most BEVs in under 30 minutes.

2. Project Description

[17] NSPI plans to install 12 EV charging stations along Nova Scotia's major highways, approximately 65 kilometers apart, which should provide sufficient infrastructure for it to be practical for BEVs to travel long distances across Nova Scotia.

[18] NSPI plans to purchase the charging station equipment from the provider of the largest EV network in Canada, the AddÉnergie FLO Network. AddÉnergie is to operate the stations for 15 years, which is the expected life of the assets and provide a five-year warranty. In return for operating the stations, AddÉnergie will charge NSPI an annual management fee, maintenance fee, and a per transaction fee when the station is used.

[19] The EV charging stations, which will be owned by NSPI, are to be located on third party property at no cost to the site owner. The site owner will be expected to ensure 24/7 access to the station and provide adequate snow removal, general site maintenance and have on-site staff available for training.

[20] Anyone using the EV charging station is to pay a fee of $2.50 per 15 minutes. The total expected revenue of $7,500 for the first year will not cover all the energy, operating, depreciation and financing costs of the stations.

[21] The total cost of this project is approximately $864,000. AddÉnergie has committed to provide $60,000 of "in-kind" project management and $402,000 is to come from NRCan. The remaining $402,000, plus $18,000 for Administrative Overhead and AFUDC, is to come from NSPI.

V. EVIDENCE

[22] NSPI has reported that:

> a) Based on www.plugshare.com, there are 102 Level 2 chargers in Nova Scotia and 2 Level 3 chargers.
>
> b) NS Power understands that some of the Level 2 chargers offer the service at no charge. However, NS Power also understands that generally the price charged to consumers for Level 2 chargers ranges from $1 per hour to $25 per charge.[1] The price at the level 3 charger at the Barrington Street Superstore in Halifax is $10/hour.
>
> [Exhibit N-4, IR-5]

[23] NSPI provided a short overview of the development and number of EV charging stations in the US. At present there are approximately 6,000 such stations. Where ownership is known, the majority are privately owned followed by those owned by local and state governments. Utilities own the least number.

[24] In summarizing the NRCan proposal NSPI stated:

> ... the current NRCan proposal does not include the Pilot Project objectives to examine system impact, local power quality, and future fast charging station deployment, given that the NRCan criteria focused on increasing awareness, availability and use of lower carbon vehicles.
>
> [Exhibit N-2, IR-3]

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[1] www.plugshare.com

[25] NSPI stated that this Application is different from other innovations such as heat pumps and Electric Thermal Storage (ETS) :

> The underlying objectives of this Pilot Project differ from those programs where the Company did not maintain ownership of the assets, such as heat pumps and ETS programs.
>
> [Exhibit N-4, IR-8]
>
> ...
>
> (a) By owning the charging stations and completing the installations, NS Power is able to select the appropriate equipment, gain firsthand experience with the installation process and effectively study the impacts on the electrical system.
>
> ...
>
> (b) There could be limitations to a Pilot Project in which the Company did not have ownership of the charging stations. Granular charging data is required to effectively measure the system impacts of fast charging and access to this data is typically only provided to network operators.
>
> [*ibid*, IR-3]

[26] The SBA does not believe it is necessary or appropriate for NSPI to undertake this project as a ratepayer activity:

> ... It is not appropriate for NSPI to enter a new type of business, funded by ratepayers, to compete against businesses and schools.
>
> ...
>
> This is a competitive industry in the transportation sector, not an essential public service for power delivery.
>
> [Exhibit N-6, p. 2]

[27] The SBA suggested that NSPI should gather user data from the existing Level 2 and 3 charging stations, to which NSPI responded:

> Almost all of the existing Level 2 charging stations in Nova Scotia are not network-enabled and are connected to the site's existing electrical service. As a result, the opportunity for data collection is limited and incorporation into the proposed Pilot Project would not be possible. NS Power believes the short term impacts of Level 3 fast charging on the electrical system is greater than Level 2 charging, however NS Power is interested in examining Level 1 and 2 charging, including at-home charging, and their potential impacts on the electrical system. Residential and commercial charging studies are currently under development.
>
> [Exhibit N-5, IR-3]

> Level 2 charging stations could be monitored; however, the opportunity for data collection is limited as the majority of them are not network enabled and will not provide information on type of vehicle, model, battery and individual usage patterns.
>
> [Exhibit N-9, p. 10]

[28] The SBA's view is that NSPI does not need to install its own chargers in order to understand the impact of EVs on power usage. The SBA suggested NSPI consider installing network enabled metering equipment on the present level 2 and 3 charging stations.

[29] The CA stated:

> To the degree that the true goal of the pilot is to gather information on the impact to the power system, it is not clear why 12 charging stations are necessary. System impact could be determined on the basis of two or four installations…
>
> [Exhibit N-7, p. 2]

[30] NSPI, in respect of the monitoring, stated:

> With respect to the number of power quality monitoring devices, NS Power proposes to purchase four devices to minimize the Pilot Project cost.
>
> …
>
> Specifically, four devices will allow NS Power to study two charging station locations at a time, with one device connected to the charging station and the other connected to an adjacent customer on the same feeder. … The other devices used for data gathering are the revenue meter and AddEnergie FLO portal software, both of which will provide continuous monitoring.
>
> [Exhibit N-9, pp. 8-9]

[31] NSPI added:

> The scale of the Pilot Project will not drive appreciable peak demand impact. When further roll out of EV charging facilities is warranted, NS Power can mitigate possible impact through alternate means.
>
> [*ibid*, p. 13]

[32] The CA believes the charging fee proposed by NSPI of $2.50 for each 15 minutes of charging is artificially low, and that this low price would skew adequate

assessments of the EV charging load shape and the adoption of EV vehicles, which are the goals of this pilot project. In response, NSPI stated:

> As set out in the Application, the proposed initial cost to use the Level 3 charging stations is $2.50 per 15 minute session, or $10/hour. This is a typical fee for customers using fast charging stations within AddÉnergie's FLO network across Canada…
>
> [*ibid*, p. 7]

[33] The NSDOE supports the proposed project for the development of a "start-up" network of electric vehicle high speed chargers. While it notes that EV adoption has lagged "somewhat" in Nova Scotia, due in part to the lack of a network of fast charging stations along major highways, it argues that this project fulfills several objectives, including:

- Electrification of transportation is central to both provincial and federal greenhouse gas (GHG) emission reduction strategies;
- Enables early EV adopters to travel Nova Scotia without unusual range constraints or barriers;
- Enables NSPI to study the increase of EV load and its growing effect on NSPI's electricity system.

[34] NSPI commented that:

> … However, increasing EV adoption in Nova Scotia is not the primary objective of the Pilot Project. …
>
> [*ibid*, p. 13]

[35] The NSDOE notes that availability of funding from NRCan makes this the right time to invest in a start-up network of fast charging stations for Nova Scotia. It continues:

> … Nova Scotia Power is well positioned to make this investment on behalf of Nova Scotians, with the technical knowledge and capability to install and maintain a reliable network.
>
> The development of this initial network of stations will help meet the basic needs of Nova Scotians to support EV adoption in the short term; and will contribute to a well-planned, cleaner, healthier transportation system.
>
> [Exhibit N-8, p. 2]

[36] To which NSPI agrees:

> … The availability of this federal funding provides an opportunity for NS Power to carry out the purposes of the Pilot Project at a lower cost for customers than what could otherwise have been achievable.
>
> [Exhibit N-9, p. 3]

[37] The SBA concludes:

> The SBA has significant concerns about NSPI's role in the growing EV charging market and the financial impact it could have on Nova Scotia ratepayers. There is no evidence that these charging stations are essential or necessary, but there is evidence that all the risks associated with them will be borne by Nova Scotia ratepayers. In addition, NSPI has overstated the benefits the charging stations will provide, both to the environment and to increased EV adoption. The SBA submits that it is not appropriate for NSPI to undertake this project, given the financial implications to both ratepayers and businesses who would be competing with the charging stations.
>
> [Exhibit N-6, p. 4]

VI. THE LAW AND RELATED SUBMISSIONS

[38] The *Public Utilities Act,* R.S.N.S. 1989, c. 380, as amended (*Act*), gives the Board broad regulatory oversight over public utilities and their capital expenditures. This Application was made pursuant to Section 35 of the *Act*, which reads as follows:

> **Approval of improvement over $250,000**
>
> **35** No public utility shall proceed with any new construction, improvements or betterments in or extensions or additions to its property used or useful in furnishing, rendering or supplying any service which requires the expenditure of more than two hundred and fifty thousand dollars without first securing the approval thereof by the Board.

[39] NSPI argues that this is a regulated service:

> Expenditures on vehicle electrification charging infrastructure are integral and inextricably linked to the "production, transmission, delivery or furnishing" of electrical energy, and are expenditures on a 'service' to or for the public. The consequences of failing to regulate EV charging infrastructure dictates that regulation is required to adequately protect the public interest, and engages the Company's duty to furnish safe and adequate services to its customers pursuant to Section 52 of the Act.
>
> [Exhibit N-1, pp. 12-13]

[40] To support its position, NSPI notes:

> It is helpful to review the definition of both 'public utility' and 'service' in confirming that the electrification of vehicles falls within the scope of NS Power's mandate as a public utility, which requires Board regulation. Section 2 of the Act reads as follows:
>
> > 2 (e) "public utility" includes any person that may now or hereafter own, operate, manage or control
> >
> > [...]
> >
> > (iii) the production, transmission, delivery or furnishing to or for the public by a public utility for compensation of electrical energy for purposes of heat, light and power.
>
> Further, 'service' in Section 2(f)(iii) of the Act is defined as the "production, transmission, delivery or furnishing to or for the public by a public utility for compensation of electrical energy for purposes of heat, light and power."
>
> [Exhibit N-1, p. 12]

[41] NSPI added:

> ... The Board also has the jurisdiction to approve projects that are linked to and improve or assess the utility's ability to produce, transmit, or deliver electrical energy to its customers. ...
>
> [Exhibit N-9, p. 11]

VII. ANALYSIS AND FINDINGS

[42] NSPI has stated that the proposed arrangement allows the Company to carry out the project at a lower cost for customers. The question for the Board is who are the customers that will benefit from the lower cost? Are they the ratepayers or the EV owners? It is obvious that the EV owners will benefit as they are able to get a fast charge at a fee that is less than the full cost of providing the service. But what are the benefits to ratepayers?

[43] The question as to what are the benefits to ratepayers has two components in this particular Application. The first, is it needed for the "... production, transmission, delivery or furnishing..." of electrical energy. The second, is whether the EV charging stations adversely affect the delivery of service to other NSPI ratepayers.

1. Service and Delivery

[44] The EV charging stations are not used in the production or transmission of electrical energy.

[45] Typically NSPI is responsible for the delivery and furnishing of 60 Hz AC electrical energy through a distribution network at various standard voltages to a metering point. How the customer uses that electrical energy in whatever quantity, by either transforming it to a different voltage, or to DC, is not the responsibility of NSPI. In fact, many complaints about high energy bills have been decided in NSPI's favour on that point alone.

[46] In the diagram of a DC Fast Charge station [Exhibit N-1, p. 22] there is a separate "metering cabinet". The "metering cabinet" is defined as a "Metering cabinet for metering electrical distribution". The only connection from the metering cabinet is to the "DC Fast Charger". The responsibility of NSPI for the distribution or furnishing of electrical energy ends at a customer's meter. The transformation of the electrical energy such that it can be used to charge an EV battery occurs after the electrical meter.

[47] In 2013 NSPI applied for an interruptible rate to provide shore power at the Port of Halifax and other Nova Scotia ports (Shore Power Rate). The Board issued its Decision, 2013 NSUARB 195, approving the rate. In that application the Halifax Port Authority invested $10 million (after assistance from the Federal Government) on two shore berths. NSPI provides power to these shore berths and the Halifax Port Authority resells it to berthed ships as metered tenants of the Port. The technicalities of how the connections are made to a berthed ship or how, if at all, the power is "transformed", is not outlined in the Decision, nor is it of concern to NSPI.

[48] NSPI does not own customers' equipment or appliances, such as heating systems, boilers, phones, etc. NSPI only supplies electrical energy through a meter to equipment or appliances owned and used by its customers. An electric utility is obligated to supply electrical energy to a customer's premises without prejudice. Charging batteries with electricity, in this case to propel a vehicle, is similar to charging a cellphone, a lawn mower, a portable computer or a flashlight.

Findings

[49] The Board finds that this project is not a regulated utility service as the assets are not integral to the production, transmission, delivery and furnishing of electrical energy.

[50] The Board finds that the EV fast charging stations are similar to shore berths and any other equipment on a customers' premises and need not be owned by NSPI as ratepayer assets.

2. Adverse Affects to Other Customers

[51] One of the reasons given by NSPI to own the EV charging stations was to understand the impacts they may have on the electrical system. To maintain stability and balance within the electrical system presumably NSPI obtains some basic information about new customers before they are connected. For residential customers this would likely be a fairly standard consumption pattern, whereas for each industrial or commercial customer it would be different. In those cases, NSPI may install whatever measuring devices it deems necessary to measure the consumption pattern so as to meet the

demands of that industrial or commercial customer while maintaining stability for all other customers.

[52] In this Application, NSPI intends to purchase four devices to gather the information on two EV charging stations at a time (one to monitor the EV charging station, the other to monitor the effect on nearby customers). These measuring devices could be relocated to other charging stations as needed. NSPI did not state a need to monitor all 12 stations at the same time.

[53] If the Company owned the EV charging stations then NSPI could get "…granular charging data…" and information about "…type of vehicle, model, battery and individual usage patterns" which is not readily available otherwise. No evidence was led as to what additional "granular" charging data was required to better enable NSPI to fulfill its service obligations. NSPI is not known to collect information about the models and individual usage patterns of electrical appliances owned by customers, so the need to do so for these EV charging stations is unclear.

Findings

[54] The Board finds that the evidence does not support the need for NSPI to be the owner of the EV charging stations to accomplish the declared purpose of this project, which is to study the impact on the power system.

[55] To be prudent NSPI should research the load patterns of the EV charging stations and the impact they may have on the electricity system. The cost of the devices to measure the impacts, as needed, may be a capital cost to the ratepayers depending on the particular circumstances of the infrastructure.

[56] NSPI may wish to work with the owners/operators of the EV charging stations to gather whatever additional data the Company deems is needed, to obtain a better understanding of the impact on the electrical system.

VIII. CONCLUSION

[57] The proposed capital and operating investment in the ownership of the EV charging stations is not for the distribution or furnishing of electrical energy.

[58] NSPI does not need to be the owner of the EV charging stations in order to measure the impact on the system and ensure there are no adverse impacts to other customers.

[59] The approval of capital work order CI# 50295 is denied.

[60] An Order will be issued accordingly.

DATED at Halifax, Nova Scotia, this 4th day of January, 2018.

Murray E. Doehler