

NOVA SCOTIA UTILITY AND REVIEW BOARD

**IN THE MATTER OF:**    The *Public Utilities Act*, R.S.N.S. 1989, c.380, as amended  
                                  - and -

**IN THE MATTER OF:**    A REVIEW of NOVA SCOTIA POWER INCORPORATED's  
                                  interconnections process under s. 2C of the *Electricity Act*

Evidence of

Patrick D. Bateman, Principal Consultant & Strategic Advisor, PDBateman & Associates Inc.

On Behalf of

Energy Storage Canda (ESC)

December 13, 2023

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## 2. QUALIFICATIONS

My name is Patrick D. Bateman. I am the Principal Consultant and Strategic Advisor at PDBateman & Associates Inc. (“PDB”), located at 6071 Valley Field Crescent, Orleans, Ottawa, Ontario, K1C 5P3. In this role I provide project and market development support to clients including industry organizations and independent power producers, to advance their contribution to a clean, reliable and affordable electric future. I hold an: MSc Renewable Energy; a BSc Environmental Biology; and an Indigenous Canada certificate. In January 2024, I will commence an LLM in Energy and Infrastructure Law. My abridged résumé is enclosed for your reference (see Appendix).

## 1. INTRODUCTION, & SCOPE

In 2023, there are numerous points of reference that confirm the Government of Nova Scotia is seeking to accelerate Battery Energy Storage Systems (BESS) deployment in the province, including (but not limited to):

- In his press release accompanying the tabling of Bill 264 to amend the *Electricity Act* in March, the Minister of Natural Resources and Renewables stated that “[w]e need to accelerate the use of battery storage in Nova Scotia to help us get off coal and meet our renewable electricity targets.

*These amendments encourage innovation and early adoption of battery technology in the province.”<sup>1</sup> [emphasis added]*

- The “Joint Policy Statement on Developing and Transmitting Clean, Reliable and Affordable Power in Nova Scotia and New Brunswick” from the Governments of Nova Scotia, New Brunswick, and Canada identifies BESS and renewable integration as “priority projects” required to support the phase-out of coal-fired electricity by 2030, and the transition to clean energy.<sup>2</sup> [emphasis added]
- Nova Scotia’s Clean Power Plan also establishes a target of 300-400 MW of BESS by 2030, and states that the Department of Natural Resources and Renewables is “*presently reviewing applications for 300MW of innovative early battery deployment projects, across multiple Nova Scotian sites and communities*”.<sup>3,4</sup> This scale and pace of deployment is much greater than the results of the most recent Evergreen Integrated Resource Plan (IRP).<sup>5</sup>

In addition to issues raised by non-Battery Energy Storage Systems (BESS) Interconnection Customers in M10905, the current interconnection process contains several shortcomings unique to BESS that impede the scale and pace of BESS deployment such as: lack of clarity on how the existing interconnection process applies to BESS (e.g., procedures; fees; studies, requirements, etc.); and lack of defined rules and processes for the evaluation of operating schedules in system impact studies.

Positive progress has been made in M10905 to date, including that “*NSPI has indicated its intention to directly include battery energy storage resources as a separate type of resource*” and that “*they [NSPI] are amenable to directly incorporating battery energy storage provisions into the procedures to appropriately study the impact that controllable battery systems can have on the grid.*”

NSPI has also indicated that implementing Synapse’s recommendations under the headings:

“*[i]ncorporate battery energy storage system resources in to SGIP*”; and “*[m]odifications to the DGIP battery energy storage resources*” are low complexity, with a short implementation time-frame<sup>6</sup>.

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<sup>1</sup> [Department of Natural Resources and Renewables \(March, 2023\) “Electricity Act Amendments Allow More Energy Storage Solutions”](#)

<sup>2</sup> [Natural Resources Canada \(October, 2023\) “Joint Policy Statement on... Power in Nova Scotia and New Brunswick”](#)

<sup>3</sup> [Nova Scotia Department of Natural Resources and Renewables \(October, 2023\) “Nova Scotia’s 2030 Clean Power Plan”](#)

<sup>4</sup> My understanding is that these 300 MW of projects are: owned by both NS Power and Independent Power Producers (IPPs); connected at the transmission-system level; and have a median individual project size of not less than 50 MW / 200 MWh. At present, there are three (3) active transmission interconnection requests for battery projects, NSPI’s: Lunenburg (IR 664); Halifax (IR 662); and Kings (IR 697).

<sup>5</sup> The most recent Evergreen Integrated Resource Plan (IRP) modelling results feature an average installed capacity of 158 MW of BESS in 2030 in the eleven scenarios without the Atlantic Loop. The average of the scenario with the Atlantic Loop is 77 MW.

<sup>6</sup> NSUAR M10905 N-2 NSPI Reply Comments & Recommendations, pg. 7 – 8, of 14

Synapse have recommended “*both an initial stage of update to core SGIP and DGIP documents, but also - as necessary - a second round of updates in later 2024.*”<sup>7</sup> And NSPSO have indicated that this approach is “*reasonable in principle*”.<sup>8</sup>

With this in mind, I will be reserving more substantive input and recommendations for when revised and new materials are available with proposals for how to implement Synapse’s recommendations later in M10905. At this time, ESC have asked that I address the following question in my Evidence:

- specific opportunities and challenges that should be addressed in M10905 for BESS as Distributed Energy Resources (DERs), Non-Wires Alternatives (NWAs), and integration of BESS with existing and new wind power facilities (i.e., “Hybrids”, “Hybrid Expansions” resp.)

### 3. RECOMMENDATIONS

#### 3.1 DISTRIBUTED ENERGY RESOURCES, AND NON-WIRES ALTERNATIVES

Distributed Energy Resources (DERs) are equipment or technology interconnected at the distribution system-level, that either generate or discharge electricity, or are a controllable loads. DERs “*covers a wide variety of resources, including electric battery storage systems, rooftop solar panels, products like smart thermostats that enable one to reduce power usage, energy efficiency measures, thermal energy storage systems such as ice storage, or electric vehicles and their charging equipment.*”<sup>9</sup>

Non-Wires Alternatives (NWAs) can be defined as an electricity grid investment or project that uses non-traditional transmission and distribution solutions, such as distributed generation, energy storage, energy efficiency, demand response, and grid software and controls, to defer or replace the need for specific equipment upgrades, such as new lines or transformers, by reducing load at a substation or circuit level. While generation can be an NWAs in some instances, the purpose for the deployment of NWAs can generally be distinguished from that for generation.

Both DER and NWA can be more effective - from both a cost and performance perspective- than traditional transmission and distribution solutions. For this reason, they are increasingly being

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<sup>7</sup> NSUARB M10905 N-1 Synapse Final Report for M10905, pg. 5 of 82

<sup>8</sup> NSUARB M10905 N-1 Synapse Final Report for M10905, pg. 5 of 82

<sup>9</sup> [FERC Order No. 2222 Explainer: Facilitating Participation in Electricity Markets by Distributed Energy Resources](#)

incorporated into supply-mix, and/or distribution and transmission planning processes in other jurisdictions:

To name but a few examples:

- In Ontario, NWA are routinely considered during Integrated Regional Resource Plans (IRRP)s<sup>10</sup>. And ownership of DERs and NWAs can be by regulated utilities, or by third parties.<sup>11</sup> The Independent Electricity System Operator (IESO)'s "Industrial Conservation Initiative" (ICI) program incentivizes eligible industrial and commercial customers to reduce their demand during peak periods in order to help the province defer the need for investments in new electricity infrastructure that would otherwise be needed.<sup>12</sup> Toronto Hydro's Local Demand Response (LDR) is an NWAs program that leverages behind-the-meter DERs to address short-term station capacity constraints. Hydro One offers a "Residential Reliability Improvement" program to customers in neighbourhoods with a high number of annual outage hours where customers receive Tesla's Powerwall Batteries to reduce outage duration and impact.<sup>13</sup>
- In Alberta, a consultation is currently underway to amend the Transmission Regulations to expand the use of NWAs as a service or regulated asset to defer transmission investments by providing congestion relief.<sup>14</sup>
- In New York, "*utilities are working to identify opportunities to deploy NWAs in their service territories in order to defer costs, decrease reliance on fossil fuels, and increase resiliency and reliability of the grid*".<sup>15</sup> And considerations related to market design for "Storage as Transmission" are also underway at NYISO.<sup>16</sup>

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<sup>10</sup> [Independent Electricity System Operator \(May 26, 2023\) "Integrated Regional Resource Plans: Guide to Assessing Non-Wires Alternatives"](#)

<sup>11</sup> [Ontario Energy Board \(March 28, 2023\) "Filing Guidelines for Incentives for Electricity Distributors to Use Third-Party DERs as Non-Wires Alternatives"](#)

<sup>12</sup> [IESO \(July, 2022\) "Industrial Conservation Initiative Background and FAQs"](#)

<sup>13</sup> [https://www.hydroone.com/residentialservices\\_/Pages/residential-reliability-improvement-program.aspx](https://www.hydroone.com/residentialservices_/Pages/residential-reliability-improvement-program.aspx)

<sup>14</sup> [Government of Alberta Ministry of Affordability and Utilities \(October 23, 2023\) "Transmission Policy Review: Delivering the Electricity of Tomorrow"](#)

<sup>15</sup> [Joint Utilities of New York, Non-Wires Alternatives \(NWA\), Opportunities & Solicitations](#)

<sup>16</sup> [NYISO \(July 11, 2023\) "Storage as Transmission"](#)

NS Power’s innovative Smart Grid Atlantic and Intelligent Feeder Projects are generating interesting and valuable learnings on DERs and NWAs in Nova Scotia.<sup>17</sup> However, the broader deployment of energy storage as DERs and NWAs is not currently routinely fully considered in the province, nor enabled by the technical, policy and regulatory landscape.

For energy storage as DERs, barriers include: an absence of market-based price signals; and/or utility visibility and control (of aggregated or individual DERs). For energy storage as NWAs, barriers include how energy storage projects are treated in the interconnection queue similarly to renewable generation assets<sup>18</sup>, as opposed to as assets that enable renewable generation integration. Seeking to address these barriers is aligned with the government’s intent for this interconnection process review “*to ensure the best value for ratepayers and consistency and predictability for generators*”.<sup>19</sup>

### Recommendation(s)

- A) I recommend that the Board direct NS Power to develop a “DER Integration Roadmap” through a consultative stakeholder process. The outcomes of this process would include definition on: the applications and services that energy storage as DERs can provide to customers, utilities and the system operator; the value of these services, and how that value can be unlocked through utility requirements, market signals, and/or other enabling factors; and the process and timelines for how and when these applications and services from energy storage as DER will begin to play a role in the province (where applicable). The outcomes from the development of this Roadmap would also identify further needs to calibrate the interconnection process for DERs that play a more meaningful and dynamic role in the system.**
- B) I recommend that criteria be established within the new “separate type of resource” for energy storage for when it can be considered an NWA<sup>20</sup>, and that energy storage as NWAs – in effect - receive a fast-tracked path through the interconnection process and queue.**

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<sup>17</sup> <https://www.nspower.ca/cleanandgreen/innovation/intelligent-feeder>

<sup>18</sup> NS Power, M10905 – Response to Energy Storage Canada IR-2

<sup>19</sup> NSUAR M10905 Final Terms of Reference

<sup>20</sup> : For example: i) identified as a cost-effective partial solution to the need for traditional system upgrades identified in a system impact study, or in the course of system planning; ii) operational intent is increasing grid reliability and resilience, and/or increasing renewable electricity supply via increased hosting capacity, and/or reduced curtailment and network congestion; and iii) curtailment occurs with dispatchable generators, and before variable generators.

Furthermore, I recommend that both NS Power and IPP should be capable of owning and operating energy storage as NWAs. And, I recommend that the Board provide clarity on when energy storage as NWAs could (or could not) be rate-based as a distribution or transmission-asset to act as an NWA.

### 3.3. INTEGRATION OF BESS WITH WIND POWER FACILITIES

The integration of BESS with existing and new wind power generation facilities represents an option to reliably integrate variable renewable generation while boosting system strength and security, and reducing curtailment and network congestion amongst other benefits. “Hybrid” wind/storage facilities can be in many configurations (e.g., “behind-the-meter” or “in-front-of-the-meter”; and/or charged exclusively or partially by the wind power facility). The configuration chosen, can present significantly different potential system impacts, and thus require different levels of interconnection process.

**C) I recommend that the new “separate type of resource” for energy storage differentiate between BESS that is stand-alone, and various configurations of BESS that are sited at the same point of interconnection at a new or existing wind power facility. The development of the interconnection process (i.e., procedures, fees, timelines, studies, approach to defining “operational intent” in generator interconnection agreements, etc.) for hybrid BESS should give unique consideration to multiple configurations (e.g., “behind-the-meter”, “in-front-of-the-meter”, charged exclusively or partially by the wind power facility, etc.). Further clarity, on the process to determine the “materiality” for modification and expansion of existing generation assets with BESS would also be beneficial.**

## APPENDIX: Abridged résumé of Patrick D. Bateman

### PROFILE:

- Principal Consultant & Strategic Advisor, PDBateman & Associates Inc.
- Approaching 15 years in electricity government, regulatory and market affairs
- Recognized energy transition expert and advocate, with large circle of influence
- Lateral thinker and skilled researcher, analyst, writer and communicator

### EDUCATION:

- Professional LLM Energy & Infrastructure Law, Osgoode Hall Law School (in progress)
- MSc Renewable Energy, School of Construction Management & Engineering, Reading (UK)
- BSc Environmental Biology, School of Biology & Environmental Science, Dublin (Ireland)
- Indigenous Canada certificate, Faculty of Native Studies, University of Alberta

### CAREER:

Positions I have held include the following:

- 2008 – 2009: Sustainable Energy Consultant with National Energy Foundation (UK)
- 2010 – 2019: Director-level policy & research roles with national solar industry association
- 2015 – 2022: Strategic Advisor to coalition of national renewable electricity associations
- 2019 – 2022: Interim- and Vice-President with national hydropower producers' association
- 2022 – present: Principal Consultant & Strategic Advisor, PDBateman & Associates Inc.

My professional specialization is policy expertise at the intersection of electricity markets and climate change. I have been fortunate to work closely with small businesses, leading independent power producers, and major utilities throughout Canada on diverse project and market development opportunities and challenges ranging from kilowatt-scale residential solar programs, to gigawatt-scale hydropower regulatory compliance. I have served as an expert witness before: House of Commons; Senate; and Utility Commission/Board hearings. My recent consulting clients include associations such as: Electricity Canada; the Canadian Renewable Energy Association; Energy Storage Canada; Solar Nova Scotia, and privately-held and publicly traded IPPs.