Crystal Henwood, Regulatory Affairs Clerk, NSUARB

Transmitted electronically to: Crystal.Henwood@novascotia.ca

May 31, 2023

Dear Ms. Henwood,

**RE: Second stakeholder comments and questions submission, and discovery questions (M10905)**

Energy Storage Canada (ESC) is the national trade association dedicated to accelerating the deployment of energy storage projects and technologies[1]. Further to ESC's written Comments on the M10905 Initial Technical Report filed May 3, 2023, and participation in the technical stakeholder conference on May 17, 2023, please find enclosed:

- discovery questions to NS Power Inc. in Appendix 1; and
- stakeholder comments and questions to Synapse Energy Economics Inc in Appendix 2.

Thank you for the opportunity to participate in this important process.

Very best regards,

Robert Tremblay

Policy Manager, Energy Storage Canada

(robert.tremblay@energystoragecanada.org)

[1] For further information, please visit: www.energystoragecanada.org

## Appendix 1. Discovery Questions to NS Power Inc. ("NSPI")

*1.1.* Classes of Energy Storage System (ESS) projects: There are various classes of ESS projects that an Interconnection Customer (IC) may apply to NSPI to interconnect. For example, they may be: interconnected at the distribution- or transmission-level; and stand-alone, integrated with generation, or integrated with load. ***ESC asks that NSPI provides a table that presents the various classes of ESS projects that an Interconnection IC may apply to NSPI to interconnect. Documenting the framework through which NSPI views ESS IC will be helpful for stakeholders in M10905 to consider the applicable studies, fees and procedures, etc. Please provide information about the defining attributes of each of the various classes (e.g. capacity and technical thresholds, minimum and maximum nameplate capacity where applicable, system configuration relative to grid and/or load and/or generation, etc). Please include the proposed class of IC for projects less than 10 MW if that applies to ESS.***

1.2. System benefits of ESS: In several submissions from stakeholders and in discussion during the first technical conference, the system benefits of ESS were a reoccurring theme (specifically as those system benefits relate to increasing grid hosting capacity to efficiently and reliably integrate other IC). ***ESC asks that NSPI describe the attributes of ESS that in its view provide the most benefit and value to the future electricity system in Nova Scotia as it relates to supporting the interconnection of new resources. Please present NSPI's view on the potential component parts of the "value stack" of ESS in general. As possible, please consider this in relation to the integration of new: variable renewables; inter-regional transmission; and also for the phase out of coal-fired generation. In this context, please also discuss the potential role of: IR 662; IR 663; and IR 664.***

1.3. Reducing curtailment of variable renewable electricity with ESS: The Evergreen IRP Final Modelling Results published by NSPI on Monday, May 29th, 2023 state that "[w]*ind curtailment between 10% and 45% is observed across the range of scenarios in the long term (average of ~30%)*", and that "*… generation from wind and solar that is curtailed due to a combination of i) wind integration constraints ii) transmission limitations iii) load/generation balance (i.e. wind + solar > load); NS Power will investigate curtailment management strategies to reduce the level of curtailment seen with increasing penetration of variable renewable resources on the grid*". In the context of increasing grid hosting capacity to efficiently and reliably integrate other IC, ***ESC asks that NSPI comment on the potential role of ESS in said curtailment strategies in general – whether standalone, or integrated with generation and/or load - to reduce curtailment by alleviating wind integration constraints, transmission limitations, and imbalances between generation and load. ESC asks that NSPI comment on the potential role of ESS: IR 662; IR 663; and IR 664, to reduce curtailment by alleviating wind integration constraints, transmission limitations, and imbalances between generation and load.***

1.4. Technical requirements for interconnection: In "NS Power Comments on Synapse Interconnections Processes Report Attachment" (pg. 16 of 18), NSPI stated that "*NS Power continues to introduce more stringent requirements for Inverter Based Resources to ensure the continued reliable operation of the system while supporting increased penetration of wind and solar generation, introduction of grid scale batteries, greater reliance on imported energy, and reduced operation of synchronous fossil-fuel based dispatchable generation. All of these factors highlight the need for increased and more stringent technical requirements*." ***ESC asks that NSPI reference the technical requirements that apply to inverter-based ESS IC for the classes identified in question 1.1 above, and describe how said requirements are expected to change in future.***

1.5. Operating characteristics of ESS: Defining when an ESS should be considered to be exporting (and at what portion of its nameplate capacity) for the purpose of system impact studies has been a reoccurring theme in both the initial stakeholder comments and questions, and during the first technical conference. ***ESC asks that NSPI detail their current (and/or proposed) approach(es) to defining the operating profiles of ESS for the classes identified in discovery question 1.1 above, for the purpose of system impact studies. Furthermore,* ESC asks that NSPI detail *their current (and/or proposed) approach(es) to defining the proposed operating profiles of ESS: IR 662; IR 663; and IR 664, for the purpose of their system impact studies.***

1.6. "Fast Tracking" interconnection requests: In "NS Power Comments on Synapse Interconnections Processes Report Attachment 1, pg. 6 of 18", NSPI states that "[t]*he DGIP and GIP documentation already provide guidance on when fast-tracking interconnection requests is appropriate*." ***ESC asks that NSPI detail when fast-tracking interconnection requests would (and would not) be appropriate for ESS, discussed in relation to the classes identified in discovery question 1.1 above.***

1.7. Hosting Capacity: The following list is taken from IREC's "Toolkit & Guidance for the Interconnection of Energy Storage and Solar-Plus-Storage Systems", pp. 95 – 97. ***ESC asks that NSPI comment on the feasibility of making each of these pieces of information available. For information that could feasibly be made available, please comment on how regularly it would be feasible to update it (i.e. real-time, weekly, monthly, quarterly, semi-annually, annually, etc.)***

- "*Total capacity of substation/area bus or bank and circuit likely to serve proposed site*
- *Aggregate existing generating capacity interconnected to the substation/area bus or bank and circuit likely to serve proposed site*
- *Aggregate queued generating capacity proposing to interconnect to the substation/area bus or bank and circuit likely to serve proposed site*

- *Available capacity of substation/area bus or bank and circuit likely to serve proposed site*
- *Whether the proposed generating facility is located on an area, spot, or radial network*
- *Substation nominal distribution voltage or transmission nominal voltage if applicable*
- *Nominal distribution circuit voltage at the proposed site*
- *Approximate circuit distance between the proposed site and the substation*
- *Load profile showing 8760 hours, by substation and transformer, when available*
- *Relevant line section(s) actual or estimated peak load and minimum load data, when available*
- *Number and rating of protective devices, and number and type of voltage regulating devices, between the proposed site and the substation/area*
- *Whether or not three-phase power is available at the site and/or distance from three-phase service*
- *Limiting conductor rating from proposed Point of Interconnection to distribution substation*
- *Based on proposed Point of Interconnection, existing or known constraints such as, but not limited to, electrical dependencies at that location, short circuit interrupting capacity issues, power quality or stability issues on the circuit, capacity constraints, or secondary networks*
- *Any other information the utility deems relevant to the applicant*
- *Substation:*
    - *Name or identification number*
    - *Voltages*
    - *Substation transformer's Nameplate Rating*
    - *Existing generation (weekly refresh is desired)*
    - *Queued generation (weekly refresh is desired)*
    - *Total generation (weekly refresh is desired)*
    - *Load profile showing 8760 hours, by substation and transformer*
    - *Percentage of residential, commercial, industrial customers*
    - *Currently scheduled upgrades*
    - *Has protection and/or regulation been upgraded for reverse flow? (yes/no)*
    - *Number of substation transformers and whether a bus-tie exists*
    - *Known transmission constraint requires study*
    - *Notes of any other relevant information to help guide interconnection applicants, including electrical restrictions, known constraints, etc.*
- *Feeder:*
    - *Feeder name or identification number*
    - *Substation the feeder connects to*

- *Feeder voltage*
- *Number of phases*
- *Substation transformer the feeder connects to*
- *Feeder type: radial, network, spot, mesh, etc.*
- *Feeder length*
- *Feeder conductor size and impedance*
- *Service transformer rating*
- *Service transformer daytime minimum load*
- *Existing generation (weekly refresh is desired)*
- *Queued generation (weekly refresh is desired)*
- *Total generation (weekly refresh is desired)*
- *8760 load profile*
- *Percentage of residential, commercial, industrial customers*
- *Currently scheduled upgrades*
- *Federal or state jurisdiction*
- *Known transmission constraint requires study*
- *Notes of other relevant information to guide interconnection applicants*"

## Appendix 2. Comments and Questions to Synapse Energy Economics Inc. ("Synapse")

*2.1.* Section in Revised Report on ESS: As mentioned by Synapse in the first technical conference, "[u]*pdating Generator Interconnection Procedures (GIPs) and rules to better accommodate energy storage*" was the theme mentioned most frequently in stakeholder comments. ***ESC requests to Synapse that ESS be allocated a dedicated section in the Revised Report (separate from generation), as there is less interconnection and operating experience with ESS than with generation in the province, and to best account for the many ways that ESS differ from other IC, and as such requires unique consideration and treatment.***

2.2. ESS project classes by capacity and technical thresholds: The studies, fees, and procedures (including potential fast-tracking) that are applicable to various project classes differ, and are proposed to differ, subject to certain capacity and technical thresholds. ***ESC requests to Synapse that the Revised Report tabulate this information to clarify the current and proposed (e.g. proposed new 10 MW class) treatment for various IC. It would be appreciated if ESS could be classed by the answer to discovery question 1.1 in Appendix 1. Also, a graphical flowchart representation of the interconnection process as requested by the Department of Natural Resources and Renewables for these classes would be appreciated. Documenting this information in this way will be helpful for stakeholders in M10905 to fully understand and consider the applicable studies, fees and procedures, etc.***

2.3. System upgrade cost allocation: In M10872, there was Evidence presented, and Closing Arguments made, on the appropriateness of the cost causer pays methodology for allocation of system upgrade costs to proponents of net metering projects in the forthcoming Commercial Net Metering Program. Several Intervenors recommended that this topic be discussed in detail and resolved in M10905. ***ESC requests to Synapse that the Revised Report include a summary of the Evidence, and Closing Arguments, on the methodology for cost allocation of system upgrades in M10872.***

2.4. Interests of third-party asset owners (including prospective ESS owners): The scope in the M10905 Final Terms of Reference includes "*[t]he extent to which NS Power's protocols or implementation practicalities result in a bias towards NS Power or Emera self-interest, and against third-party generator interests*." The M10905 process may more effectively solicit the perspectives of third-party asset owners (including ESS) on this topic through bilateral communications between Synapse and third-party asset owners.