Feedback Form

Distributed Energy Resources (DER) Potential Study – September 22, 2021

Feedback Provided by:

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Following the September 22nd public webinar on the DER Potential Study, the Independent Electricity System Operator (IESO) and the consultant, Dunsky supported by Power Advisory, are seeking feedback from participants on the pre-assessment screening criteria, the pre-assessment results, and on the proposed scenarios.

The referenced presentation and associated MS Excel worksheet (with the full list of DER measures and the pre-assessment results) can be found on the DER Potential Study webpage*.*

Please provide feedback by October 13, 2021 to **engagement@ieso.ca*****.*** *Please use subject header: DER Potential Study. To promote transparency, this feedback will be posted on the* DER Potential Study webpage *unless otherwise requested by the sender.*

The IESO and its consultant will work to consider and incorporate comments as appropriate and post responses on the webpage.

Thank you for your contribution.

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Pre-assessment screening criteria

Topic	Feedback
Are there any measure screening criteria missing that warrant inclusion? *For reference: Measure screening criteria are described in slide 22 of the presentation deck*	The measure screen criteria should include the **responsiveness of a technology to a dispatch signal**. As the study looks to analyze 5-minute dispatchability DERs that can contribute energy, capacity, operating reserves and/or frequency regulation within that time frame should explicitly recognized.

Pre-assessment results

Topic	Feedback
Do the short-listed technologies capture appropriate DERs given the study's 10-year time horizon? Are there measures that have been screened out that should be included and why? Alternatively, are there measures that should be screened out and why? *For reference: The full list of measures and the results of the screening are identified in last tab of the Measure List and Pre-Assessment MS Excel worksheet* *Note: The study aims to include measures expected to have high value/uptake over study period*	**Electric resistance technologies with thermal storage**, for either residential (district heating) or non-residential (industrial process heating) should be included as a short-listed technology. A growing demand for low-carbon solutions for heating needs has led to innovative technologies that can be economically feasible while connected behind-the-meter at the distribution level. These types of technologies should be viewed in the same way as Smart Electric resistance water heaters and other heating devices which are recommended for inclusion in the study and marked as "feasible & demonstrated" for all grid services aside from energy inject and arbitrage. The study's 10-year time horizon extends past Ontario's 2030 carbon reduction target. Therefore, it makes sense to include technologies that can leverage the province's clean power grid to contribute to achieving the goals laid out in the Made-in-Ontario Environment Plan. Even if these technologies are not yet deployed in Ontario, they could be within the next 10 years given the increased climate action pledges from both the private and public sectors.

Topic	Feedback

Scenarios

Topic	Feedback

Which factors should be varied between scenarios? Do you have suggestions on how such factors should be varied across three scenarios? *For reference: Examples of factors that could be adjusted are listed on slide 37 of the presentation deck* *Note: The study aims to prioritize factors expected to be most influential in driving DER value/uptake in Ontario*	END USE ELECTRIFICATION Electrification represents a clear path to decarbonization across many sectors of the economy from district heating networks to industrial process heat. As the cost of renewable energy generation continues to drop, the feasibility of low-carbon, fuel switching innovation (e.g., EVs, energy storage, power-to-heat) is on the rise. This combination of factors could lead to new and incremental loads supported by technologies with, often, dispatchable operations and storage capabilities. For instance, technologies based on joule heating could provide nearly immediate responsiveness to increase/decrease consumption which could influence the 5-minute dispatchability analysis. While many jurisdictions need to first decarbonize their power grids to effectively decarbonize, Ontario is fortunate to have a relatively clean grid already. Therefore, these potential factor fits within the studies time frame. This factor, including some accounting for the types of technologies that would support it, could be increased/decreased based on electrifying some portion of a sector or industrial process conventionally powered by fossil fuel. CHANGES IN CURTAILMENT MANAGEMENT There was roughly 2,600 GWh of curtailed energy in 2020. As opposed to simply curtailing this energy, fast acting DERs that fall into the storage category could make use of it, assuming it is not constrained locally.

Topic	Feedback
	If this energy is used to electrify end-uses the province could benefit from targeted decarbonization. This factor could be varied across scenarios based on curtailment reduction targets.

General Comments/Feedback

The Thermal Storage Measure Group/Category is fairly limited in scope as the non-residential applications do not include an process heat applications. Also, technologies in this category are noted as not being able to provide Frequency regulation or Operating reserves. However, advancements being made in the thermal energy storage space, resulting in part from the increased focused on decarbonization, have produced innovative technologies that are being overlooked.

Certain thermal energy storage technologies, especially those which use a joule heating approach, can respond rapidly to ramp up or ramp down their load, on demand thus providing frequency regulation. Because thermal storage technologies typically provide HVAC for residential or non-residential settings or provide process heat for industrial applications, thermal storage technologies can draw power across a wide range of load capacities and vary their load within 5 minutes, anytime of day.

A subset of electrothermal technologies can charge and discharge simultaneously. When coupled with a host with a constant need for thermal energy (e.g., industrial process heating) there would be no cap on the energy the storage technology could absorb from the grid. This aspect would be helpful in managing frequency regulation as the electrothermal storage assets could be relied on consistently as effective energy sinks in time of an excess supply of energy (with the bonus of decarbonizing the province’s heating needs).

A broader definition of thermal energy storage, including technologies that leverage Ontario’s clean electricity to directly displace fossil fuels used for aggregated space heating (i.e., district energy, commercial/residential towers) or industrial process heating, should be adopted for this study.