Stakeholder Feedback and IESO Response

Enabling Resources Program

Storage and Co-located Hybrid Integration Project

Following the July 24, 2025, Storage and Co-located Hybrid Integration engagement webinar, the IESO invited the sector to provide comments and feedback on the materials presented by August 21, 2025.

The presentation materials and stakeholder feedback submissions have been posted on the engagement webpage for this engagement. Please reference the feedback posted on the engagement page to review the full submissions, the below information contains excerpts and a summary of the input received.

The feedback below was received following the July 24th engagement session.

- Brookfield Renewable
- Charge Power Inc.
- Electricity Distributors Association (EDA)
- Energy Storage Resource (ESR) Consortium
- Oneida Operations (Northland Power)
- Ontario Power Generation (OPG)
- Workbench Energy

Feedback Summary and IESO Responses: ERP Engagement Session

Topic: CycleDEL

Question(s): Is CycleDEL sufficient to limit the cycling for storage in Phase 1? What is the expected default setting?

Summary of Feedback	IESO Responses
ESR Consortium: Supports concept, more working examples for CycleDEL are required.	The IESO will provide working examples during the next engagement session on October 16, 2025.
Northland Power: • Will eventually be a benefit, specifically, if it can be passed into the Real Time (RT) to prevent further dispatches regardless of what the telemetered State-of-Charge (SoC) is • Lowering the MaxSoC will impact how much the CycleDEL will be set to	CycleDEL cannot be incorporated into RT due to technical and operational challenges. CycleDEL will be a daily dispatch parameter without restrictions of either increase or decrease of the parameter. It will be independent of of the 'daily cycles' and SoC range.
Workbench Energy: • Warranties are based on annual cycle measurements. • Daily cycle values are not an equivalent measure and may have unintended consequences for both IESO and Battery Energy Storage Systems (BESS) (under/over-utilization of assets).	The IESO will still collect the 'daily cycles' parameter at registration to understand cycling expectations for resources and consider for incorporation in Phase 2 of this project design. Daily cycles will not impact the IESO optimization or other calculations used to support optimization in Phase 1.

Topic: Derates and Round-Trip Efficiency (RTE)

Question(s): Do you have feedback on the derates that the IESO is considering; specifically, what requirements need to be set to ensure that these are used sporadically? Will there be separate derate values for injection and withdrawal? Will MPs need to derate their SoC limits? Does this only require update to max SoC limit which will result in overall SoC reduction? How frequently does the MP need to update the RTE?

Summary of Feedback	IESO Responses
ESR Consortium: • Separate derate values for injection and withdrawal as storage technology & O&M challenges may require different temporary / permanent derates. • Derates of SoC limits may be required in the future to maintain the capabilities of the facility. • Derates could be a function of how significant the usage and participation of energy storage are in the IESO-Administered Markets (IAM). • RTE may need to be derated (or re-rated) depending on the performance of the energy storage resources in addition to actual operating capabilities in different Ontario environments (e.g., winter and summer capabilities).	Thank you for your feedback. Based on the feedback, the proposed IESO market design for 'derates' is as follows: • Derates will apply to power only (for injection and withdrawals) and power derates must be submitted via Control Room Operations Window (CROW) for outages / significant changes. • Energy limits will be registered and can adjust through daily dispatch data. This is discussed in the 'Exceeding Min/Max SoC Limits' section. • A single RTE parameter will be registered and can be updated as a daily dispatch parameter. If adjusted beyond a certain limit, participants would need to call the Control Room (CR) to notify. The IESO will determine appropriate limits in upcoming design.
Northland Power: • A single derate for withdrawal and injection would suffice and could be a registered value, as it's generally indicative of the system specifications of the battery. • RTE would expect to be updated yearly – the easiest way would be to update after the IESO capacity checks and only be derated under extreme conditions.	

Topic: Exceeding Min/Max SoC Limits

Question(s): Do you anticipate needing to exceed min/max SoC limits for specific market opportunities and what are the typical min/max limits – is this a fixed/static value? Frequency and magnitude of exceeding these limits? Are there equipment concerns from this, what are the specific concerns (faster equipment aging/degradation, other)?

Summary of Feedback	IESO Responses
ESR Consortium: • Generally, static and ESR MP will not want to exceed min/max SoC limits to ensure warranties are not invalidated and/or equipment life expectancy is degraded. However, market conditions and profitability may justify stressing the ESR. • Registration process should allow for updates by resources to reflect the changing limits. • SoC limit ERP design changes should be initiated as voluntary measures to allow proponents ability to manage their own SoC.	Based on this feedback, the IESO proposed market design for 'exceeding min/max limits' is: • **MaxSoC** - Registered parameter (typical max) - Daily dispatch parameter: Deviation from their typical value up to X% due to certain reasons (primarily temperature-related, and can incorporate some ageing %) - Update allowed within the mandatory window • **MinSoC –** Similar rationale as MaxSoC, noted above.
Northland Power: • Min/Max SoC limits should exist as Daily Dispatch Data, which would allow the facility to give proper market inputs dependent on what the planned site activities are. • Derates should be used to limit operating capabilities (i.e. MW's capable of injecting). • Having an Absolute MinSoC value during registration as well would be helpful.	
Charge Power: • **State of Charge (SoC) Limits:** Assets operate within 5%–95% SoC during normal conditions, with values derived and optimized during registration and commissioning; these may be adjusted annually based on State of Health. • **Risks of Exceeding Limits:** Operating outside SoC limits can lead to warranty issues, accelerated degradation, and system voltage imbalances affecting performance and requiring manual intervention. • **Maintenance Exceptions:** During annual maintenance or manufacturer-required balancing, SoC limits may be temporarily	• **Absolute MaxSoC** – Registered parameter in MWh determined by MP to establish the highest energy limit the resource may be charged to. MP can update the MaxSoC to this value without restriction if there are no limitations on responding to dispatches sent by the IESO (i.e. can be within compliance requirements). This may also come at the request of the IESO during certain system conditions, or other methods will be developed to support maintenance purposes up to this value (i.e. when compliance with dispatch could be problematic).

exceeded for individual units to restore system health.	• **Absolute MinSoC** – Registered parameter in MWh determined by the MP that establishes the lowest energy limit the resource may be discharged to. MP can update the MinSoC to this value as part of their daily dispatch data without restriction if they can remain compliant with dispatches. • CROW will only be used for power derates, energy 'derates' or 'uprates' will be either via daily dispatch parameter (with or without involvement of the CR) or via Market Forecasts and Integration (MF&I)

Topic: Uprates

Question(s): Any feedback on this concept of utilizing "uprates" to support maintenance? Any conditions or requirements that the IESO may need to consider when developing its process to allow uprates? Are there any other operational or market participation considerations that need to be considered?

Summary of Feedback	IESO Responses
No feedback	-

Topic: Operating Reserves (OR) Offers

Question(s): Are there concerns about OR provided by storage being branched from withdrawal to injection?

Summary of Feedback	IESO Responses
ESR Consortium: • Strong support of concept • The ability to provide branching may require IESO Contract Management approval and therefore, no branching market design changes should be included until IESO Contract management has clarified if consent is required and granted.	Thank you for the feedback. We are in touch with the IESO Contract Management team regarding this.
Northland Power: • Strong support of concept • Being limited to only 5 PQ pairs makes creating offers that will act competitively in the RT market difficult. • Further clarification on how the dispatch engine will view the offers while injecting to limit the quantity amount is needed – current market rules/MPM do not support these offers.	More detailed examples for fitting branching into 5 P/Q pairs will be presented in the next SE session on October 16, 2025. Further exploration of how reference levels for providing OR will be calculated and discussions with MR & MPM teams required.
Workbench Energy: • No concerns, DSO must also consider ramp rates, which may be impacted by Dx or Tx limitations.	The IESO will take note of this, thank you for your feedback.

Topic: Telemetered SoC

Question(s): Required for calculations in PD and RT timeframes. This value is expected to inform the IESO of the injection capability of the resource in MWh and therefore should account for any losses. Current performance requirements will continue, with data sent every 4 seconds to the IESO. Do MP's have concerns or foresee challenges with this requirement?

Summary of Feedback	IESO Responses
ESR Consortium: • Requests comparison between 4 second and 5-minute intervals for Telemetry submissions and expresses concern over 4-second requirement	The 4-second requirement is per existing market rules and applicable for all storage resources (existing and new). Although the calculation engines will not be utilizing information every 4 seconds, the IESO does use this information to monitor the grid and ensure the reliability.
Northland Power: • Requests comparison between 4 second and 5-minute intervals for Telemetry submissions and expresses concern related to incremental setup costs associated with the 4-second requirement	Telemetry is utilized for actions beyond DSO requirements. The IESO must maintain visibility on a granular basis to monitor actions of resources and ensure the reliability of the grid. Further details on how telemetered SoC is utilized in PD and RT timeframes may be provided in the next SE session.
Workbench Energy: • BESS facilities are often built with excess power and energy to manage degradation over contract term. This difference in SoC must be accounted for either within registration parameters or within the DSO interpretation of values.	Resources must comply with operating their facility based on their grid connection assessments. Based on the above responses, the IESO is providing flexibility on how SoC may be impacted daily with an attempt to support various maintenance requirements a BESS may require.

Topic: Energy Ramp Rates

Question(s): Do you have feedback on the 100 MW/min static ramp rate and utilizing a standardized approach to dispatch?

Summary of Feedback	IESO Responses
ESR Consortium: • Opposes static rate as a static ramp rate significantly below the technical capabilities of a resource will cause it economic harm • Requests justification of artificial restrictions and lost profit for MPs via examples & costs • Requests fairness for dx-connected resources as the IESO/LDC may be unable to appropriately monitor dx system limits and these resources may be artificially restricted	Based on this feedback, the proposed IESO market design for 'energy ramp rates' is: • The Energy Storage Facility (ESF) ramp rate requirement of 100 MW/min has been implemented to help dampen the response of these facilities to 5-minute energy dispatch instructions and mitigate the challenges they pose to Area Control Error (ACE). • A ramp rate limitation of 100 MW/min is consistent with the speed at which other fast responding resources respond to dispatches. • The IESO considered the size of procured resources, and the upper limit of 100 MW/min will allow all new BESS connecting to the grid to ramp from 0 MW to either their Pmax or Pmin within a single 5-minute interval.
Northland Power: • Opposes static rate for same reason as ESR Consortium • Recommends improving Control Room's ability to manage fast responding resources	
Workbench Energy: • 100 MW/min static ramp rate for energy will negatively impact larger resources with faster ramp capability, limiting their dispatch during real-time grid events. • IESO must provide supporting technical analysis to support this. • Bid validation process must not relate to any static ramp rates. Resources with ramps slower than 100 MW/min will need the ability to offer their ramp rates without bid validation rejections.	

Topic: General Feedback

Summary of Feedback	IESO Responses
ESR Consortium	
Market Data: In reaction to the renewed market, the ESR Consortium commented that the IESO has failed to adhere to best practices of sharing detailed information on scheduling and dispatch outcomes including the inputs on a nodal basis for i) energy offers, ii) energy bids, iii) non-dispatchable load assumed by IESO, and iv) load assigned and observed at each node. IESO must improve data sharing for market analysis and participant strategy.	This request is outside of the scope of the ERP project. ERP is currently focused on storage market design, and this feedback points to a broader discussion that impacts additional resource types. This feedback has been passed to the engagement team who will provide it to relevant teams in the IESO.
Contract Management involvement: The IESO contract management must participate in the ERP design process so that ESR MPs can understand the full impact of market design changes for Ontario ratepayers & MP operating obligations.	Thank you for the feedback. The ERP team will continue to discuss the ERP design and include IESO contract management in that process. The ERP market design is focused on supporting the most efficient decision-making through the calculation engines to maximize Ontario ratepayer value and the reliable operation of the grid.
Funding for Metering: Clarify funding responsibilities for required investments such as additional metering for station service and auxiliary load requirements.	To facilitate the optimization process, the IESO is requesting internal service load estimates (not metering) to factor into hourly calculations (DAM and PD). Based on feedback from MPs, the IESO understands it could be challenging in some circumstances to directly meter internal loads impacting the SoC of the resource. ERP does not expect additional wholesale metering requirements as part of the project scope; this will be confirmed during the settlements design module. Operational metering requirements will also be determined through future design modules as part of ERP.
Timeline: Providing more detail on the timing of all design memo steps and implementation will allow stakeholders to plan and ensure resources are available to review and analyze	Estimated timelines for the posting of design memos for Batch 2 storage design will be included in the October 16 engagement session and updated as required.

the Design Memos and how the market design changes interact with each other	
Lasting Market Design: MPs want to avoid the requirement to register and operate under one market design for a short period and then need to make changes for a new market design so early in the life of the asset	The IESO is proceeding with a phased approach for market design that will evolve to ensure the continuation of efficient and potentially expanded participation of storage resources in the IESO-administered markets and/or services.
Northland Power: • Related to the mandatory window, a shortened timeframe for changes to bids/offers would allow the fast-responding BESS to be better utilized and position itself to react to RT conditions	Thank you for the feedback. ERP will not be shortening the mandatory window requirements as it would impact all MPs, not just storage participants.
EDA: • ERP must align with LDC operational realities and infrastructure planning. The design and participation models must account for the unique operational characteristics and constraints of the dx system so that they do not potentially compromise reliability or lead to suboptimal investments in distribution infrastructure. • ERP should support both bulk and local services and enable informed DER integration. • ERP should also align with other DSO-related workstreams (e.g. OEB DSO Capabilities), ensuring that the ERP design does not preclude future developments in LDC coordination or local generation planning.	Thank you for the feedback, this has been communicated to the ERP DER Integration project team.
OPG: • OPG recommends the IESO to include all types of ESR technologies that would enhance grid reliability and flexibility within Phase 1. • OPG encourages the IESO to undertake a comprehensive review of the energy storage load charges to further optimize	Thank you for the feedback. The IESO is focused on delivering a "quick-to-implement" solution, with Phase 1 focused on SoC management and the single resource model for battery storage facilities. Phase 2 will explore regulation, uplift exemption and enhancements to Phase 1 design, including

resource operation during times of peak demand.	the consideration of other types of ESR technologies.

Evolugen

Expand ERP Design Scope: • Move beyond operational and market-side improvements. • Include contract design and connection/registration rules to support repowered wind + storage projects. • Missed opportunity if repowered wind facilities cannot offer storage pairings in the LT2 RFP (Q3/4 2026). • Encourages the IESO to prioritize Contract designs and Connection and Registration rules in its consultation.	
Support Co-Optimization: • Suggests a new "Energy + Capacity" contract type to make wind + battery pairings more dispatchable and competitive. • Calls for clarity on how storage can share interconnection points with wind facilities.	Thank you for your feedback. The ERP S/H Project is focused on supporting efficient market design. Impacts r the existing and new contracts that directly result from the optimization design will be further explored as a part of the Batch 2 Design Review. In addition, ERP will focus specifically on supporting co-located model changes due to the updated storage design.
Introduce an Interim Model • Proposes an interim model between "co-located" and "integrated" where wind and storage share interconnection capacity but are treated as separate resources. • This would avoid costly System Impact Assessments and transmission upgrades, especially since wind is intermittent and doesn't always use full capacity.	
Timing Concerns: • Current ERP timelines (e.g., Batch 2 and implementation dates) may not align with 2026 RFP. • Urges IESO to accelerate relevant changes to enable participation.	