

# Project Charter for: Storage and Hybrid Integration

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|------------------------|-------------------|--------------------|------------------------------------------------------------|
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| <b>Issue:</b>          | 2                 | <b>Sponsor:</b>    | David Short                                                |
| <b>Effective Date:</b> | November 11, 2025 | <b>Project ID:</b> | 757-1                                                      |

## 1. Executive Summary

The project has adopted a phased delivery strategy to accelerate progress on the Storage and Hybrid Integration Project. As part of this approach, the project will advance a base solution that delivers essential market functionality and establishes a scalable platform for future enhancements aligned with the project's long-term objectives.

Phase 1 focuses on enabling more effective integration and management of the 25 new storage facilities that will be in-service by Q2 2028. Key capabilities prioritized in Phase 1 include state of charge management and single resource model, both of which are critical to improving market efficiency and maintaining reliability.

Internal and external stakeholders have expressed support of a phased approach, recognizing the value of early benefits of Phase 1. The anticipated market efficiency benefits from the initial deployment are expected to offset the additional incremental project costs with completing Phase 2<sup>1</sup>.

The overall project deliverables align with two of IESO's core strategies to "Advance Reliability and Cost-effectiveness Within an Evolving System and Drive Business Transformation".

A key outcome of the project is to mitigate the Strategic Enterprise Risk of material undersupply of capacity and energy at a provincial and regional level in the near-term timeframe (2027-2029). This will be achieved by enhancing market efficiency and reliability for the approximately 3000 MW of storage procured through ELT/LT1.

<sup>1</sup> The comparison is based on the incremental costs of a two-phase solution approach vs a single complete solution that stratifies the project's objectives.

This document comprises Project Charter<sup>2</sup> Version 2 (First Release) and initiates funding for critical changes to the IESO's core market systems, enabling the early execution stage of the project. This release encompasses foundational work by Hitachi Energy along with the associated IESO support effort. Given the long-lead and critical path nature of Hitachi Energy's scope, the project seeks to advance this work ahead other work involving the IESO and non-Hitachi Energy vendors. Remaining vendor and IESO execution efforts will be addressed in a Second Release, which will complete the funding requirements for this Phase 1 of the project<sup>3</sup>.

### 3.1 Project Charter Approval

The project is tracking within its approved planning budget and timeline as per Project Charter v1. While planning and design activities continue, the project is proceeding with an accelerated delivery approach for the implementation of Hitachi Energy (HE) optimization deliverables. These activities must proceed in parallel given the significant lead time required to implement changes to the core market systems<sup>4</sup>.

#### **Execution Stage – Phase 1 Hitachi Optimization (Release 1 Approval)**

This Release is seeking approval of the Hitachi Energy component of a base solution, which is based on market designs implemented in other jurisdictions with some modifications to match Ontario's unique market construct.

The Release approval is a total of \$14.8M which includes \$2.9M contingency to reflect estimation accuracy +/- 25%, and a release completion by June 30, 2027<sup>5</sup>, which includes 4 months of contingency to reflect scheduling uncertainty. Completion of this charter work will be achieved when Hitachi delivers the optimization solution and IESO staff have successfully tested the core market solution. The project will track spending and schedule per the above and be held accountable to this budget and schedule.

The combined approved project releases thus far to \$29.6M (Opex & Capex), including the \$6.7M in (Opex & Capex) contingency.

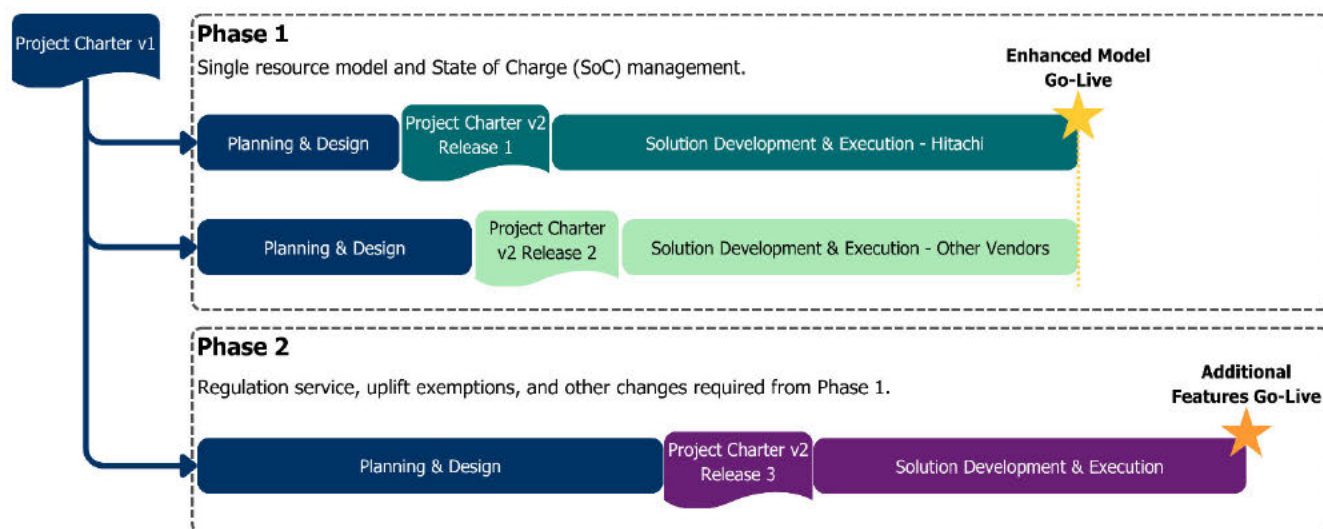
<sup>2</sup> The project has an approved Planning & Design PC v1 from Sept 2024 that anticipated a single Execution Phase to achieve all the Business Objectives by 2030 (including contingency).

<sup>3</sup> A third release is expected to delivery on the Phase 2 execution of the project that will enable battery storage to provide regulation, as well as more complex market enhancements needed to successfully operate storage resources in the market.

<sup>4</sup> Refers to the IESO's Dispatch Scheduling and Optimization (DSO) system

<sup>5</sup> Note: June 30, 2027 is not the go-live date, but instead represents the successful delivery and testing on the key solution need to support the full participation model for the S/H project. Additional work will be required in Release 2 to complete this participation model in order to go-live with Market Participants.

Below is an illustration of the S/H Integration Project phases and features.



### Key Schedule Milestones – Release 1:

| Date               | Milestone                                     |
|--------------------|-----------------------------------------------|
| June 30, 2026      | Mid-Deployment Cycle Demonstrations Completed |
| September 30, 2026 | Performance Testing Completed                 |
| December 1, 2026   | Software Development Completed                |
| December 15, 2026  | Initiate Factory Acceptance Testing           |
| March 31, 2027     | Release Delivered Software to IESO            |
| June 30, 2027      | IESO Acceptance of Hitachi Energy's Software  |

Notes:

- Storage and Hybrid Phase 1 in-service is planned for Q2 2028
- Above dates include schedule contingency

### Budgeting – Release 1:

The table below shows the anticipated expenditure in millions to complete this release, and is based on an estimate provided by Hitachi Energy after the exchange of design information between the two parties. The budget also includes the IESO effort to receive and test Hitachi deliverables.

| <b>Year</b>      | <b>2025</b> | <b>2026</b> | <b>2027</b> | <b>Contingency<br/>25%</b> | <b>Total</b> |
|------------------|-------------|-------------|-------------|----------------------------|--------------|
| <b>Capital</b>   | N/A         | \$10M       | \$1.8M      | \$2.9M                     | \$14.7M      |
| <b>Operating</b> | N/A         | \$0.08M     | \$0.02      | \$0.015M                   | \$0.1M       |
| <b>Total</b>     | N/A         | \$10.1M     | \$1.8M      | \$2.9M                     | \$14.8M      |

IESO has secured up to \$16.7M in federal funding from NRCan through the Smart Renewables and Electrification Pathways Program for costs to partially support implementation of the ERP<sup>6</sup>. The table above does not reflect offsets from the NRCan funding.

The project will seek the final release of all Phase 1 execution funding to go-live with the full set of solutions to support the new S/H participation model in 2026. There will also be a Phase 2 for additional S/H participation model elements that will follow with final charter to conclude this project – meeting all project objectives.

## 2. Business Objectives and Measures

Business objectives have remained the same since Project Charter version 1; however, Procedure for Measures have been updated to reflect the Phased Delivery approach.

| <b>Ref #</b> | <b>Business Objective</b>                                                                                          | <b>Procedure for Measures<br/>(identify how the performance will<br/>be measured)</b>                                                                                                                                                                                                                                                                                      | <b>Measured when and<br/>by whom?</b>                                                                            |
|--------------|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| 1            | Improve market and ancillary service effectiveness-by introducing a new participation model for storage resources. | Implement state of charge management and a single resource model into IESO's tools, systems and processes (Phase 1 of the Storage and Hybrid Integration Project)<br><br>Implement changes to the IESO's tools, systems and processes to allow IESO to access frequency regulation services from storage resources (Phase 2 of the Storage and Hybrid Integration Project) | When: At Phase 1 project completion and Phase 2 project completion, respectively<br><br>By whom: Project Sponsor |

<sup>6</sup> The total NRCan funding will also offset eligible expenses incurred for Distributed Energy Resource participation model design and implementation and Market Assessment and Stimulation Toolset (MAST) Project (Project ID 552)

|   |                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                         |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 2 | Maintain system reliability by introducing the new storage market participation design to support the increased installation of new storage resources. | <p>Operations planning tools and processes are updated such that the IESO can provide accurate external reliability reporting and prepare an accurate operating plan for the day-ahead market and the control room in real time including the scheduling of regulation services. The deviation of day-ahead operating plan from the corresponding external reports for storage resources should be less than 5% for a period of 6 months post go-live. (Phase 1 of the Storage and Hybrid Integration Project)</p> <p>The control room has the necessary tools and processes to understand storage/hybrid availability for energy for all scheduling timeframes. (Phase 1 of the Storage and Hybrid Integration Project)</p> <p>The control room has the necessary tools and processes to understand storage/hybrid availability for regulation for all scheduling timeframes. (Phase 2 of the Storage and Hybrid Integration Project)</p> | <p>When: At Phase 2 project completion and Phase 2 project completion, respectively</p> <p>By whom: Project Sponsor</p> |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|

As part of the planning phase as described in the Project Charter version 1, business objectives will be validated and/or adjusted, measures with sustainment targets defined, and included in the subsequent version of the Project Charter.

## 2.1 Benefits Expected

The benefits expected have remained the same since Project Charter version 1, however Addressing Organizational Strategic Risks has replaced the Advancing Sector Leadership.

**Addressing organizational strategic risks:** The Project will help mitigate the risk of material undersupply of capacity and energy at a provincial and regional level by enabling more energy to be scheduled from the ~3000 MW of storage capacity that was procured through ELT/LT1.

## 3. Project Overview

### 3.1 Project Scope

#### **Execution Phase (Hitachi Energy and Supporting Deliverables Only):**

- Development, installation, configuration/migration of various market tools
- Development and execution of test plans
- Internal/External readiness and training
- Update IT technical documentation

### 3.2 Out of Scope

Hitachi Energy's testing and go-live support during the latter part of this project - related to integrated systems testing, market trials and production deployment. This cost and schedule will be captured in the second charter release for Phase 1.

### 3.3 Resources

This project will require resources from multiple IESO Business Units including Markets & Reliability, Information & Technology Services (solution design, implementation, and maintenance of technical tools), Corporate Services, and others. These resources represent key internal stakeholders, business process owners, stewards and subject matter experts.

## 4. Potential Project Risks and Mitigation Actions

The following table outlines project risks known to date that have a critical or high residual risk level and identifies controls and mitigation actions planned or taken to reduce the risk level to an acceptable level. These risks have been updated since Project Charter version 1 to focus on execution related issues.

Project Risks relate to the successful delivery of the project and ability to meet business objectives.

**Table: Risk Summary**

| <b>Risk ID</b> | <b>Risk Description</b>                                                                                                    | <b>Residual Risk</b> | <b>Mitigation/Controls</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Target Risk</b> |
|----------------|----------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 1              | Inability to secure IESO resources results in delays in meeting key milestones                                             | High                 | <ol style="list-style-type: none"> <li>1. Incremental headcount</li> <li>2. Contract resources</li> <li>3. PPMT prioritization process</li> <li>4. Interdependency review of project and line initiatives to determine ERP impacts</li> <li>5. Quarterly long-term critical resource requirement forecast and gaps analysis for senior leadership review</li> <li>6. Monthly resource requirement reviews</li> </ol>                                                                        | Medium             |
| 2              | Executing tasks in parallel results in incorrect assumptions and missed scope resulting in rework and undermining quality. | High                 | <ol style="list-style-type: none"> <li>1. Prioritization of high impact upstream/downstream requirements and solution design to identify conflicts early</li> <li>2. ERP advisory group (cross functional design reviews)</li> <li>3. Static testing of business requirements to ensure completeness</li> <li>4. Reoccurring BA collaboration meetings to increase alignment</li> <li>5. Internal change advisory board (CAB) to streamline review of scope and design revisions</li> </ol> | Medium             |

**Note:** The project team will maintain a comprehensive risk log which will include a complete list of project risks including those with a medium or low risk level. New or modified risks and mitigation plans will be highlighted to the Project Sponsor and Project Steering Committee members via monthly progress reporting.

## 5. Change Controls

Changes in the project that will impact/exceed tolerance levels for objectives, time and cost will be managed through the formal Project Change Management Process using a change advisory board resulting in the Project Exception Report. A Project Exception Report (if approved) will result in the re-baselining of the project.

# Document Control

Note: \* indicates which roles will be required to approve in Citadel workflow, however, document will be reviewed by all other roles identified.

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| <b>Name</b> | <b>Organization</b> |
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| Citadel     | IESO                |
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| Finance     | IESO                |

### Document Change History

| <b>Issue</b> | <b>Reason for Issue</b>               | <b>Date</b>        |
|--------------|---------------------------------------|--------------------|
| 1.0          | First Issue                           | September 16, 2024 |
| 2.0          | Project Charter Version 2 – Release 1 | October 31, 2025   |

### References

| <b>Document Title</b>                                      | <b>Document ID</b>    |
|------------------------------------------------------------|-----------------------|
| Enabling Resources Program Business Case                   | [REDACTED]            |
| Project Charter Storage & Hybrid Integration v1 - Planning | [REDACTED]            |
| Project Roles and Responsibilities                         | Issued April 18, 2024 |

### Related Documents

| Document Title          | Document ID |
|-------------------------|-------------|
| Integrated Project Plan | [REDACTED]  |
| Program Business Case   | [REDACTED]  |

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