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# Technical Panel Education: Updates to IESO Monitoring Requirements: Phasor Data

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# Purpose



Introduction and Background



Overview of MR amendment



Proposed changes to MM



Stakeholder Feedback



Expected Timeline / Future Changes

# Project Objectives

The **Updates to IESO Monitoring Requirements** project will:

1. Expand the requirements for **Phasor Measurement Unit (PMU) data** to apply to **electricity storage facilities** that have an **aggregate rating > 20 MVA**; and
2. Align the power system quantities that must be **measured using PMUs** across the different resource types: **generators, transmitters and storage facilities**

# PMUs in the Broader Context

PMUs enhance the IESO's situational awareness – critical to maintaining reliability and resiliency with an increasingly dynamic power system:

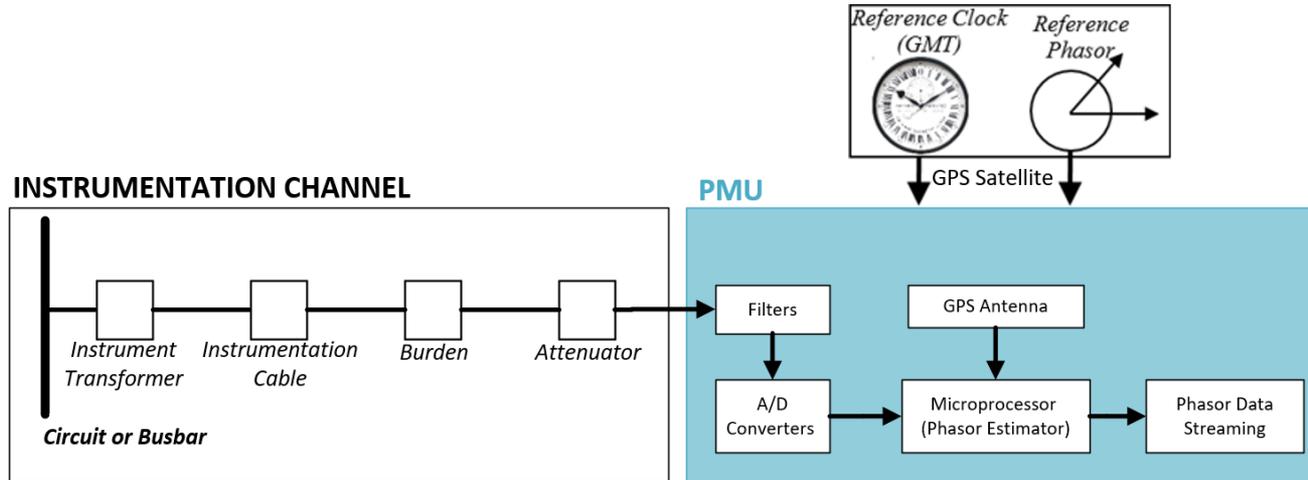
- Synchronized, high speed PMU data is increasingly being used within the IESO for **offline analysis, near-term planning, and real-time operations.**

Aligns with the direction that NERC is moving towards:

- The North American Electric Reliability Corporation (NERC) created the **Synchronized Measurement Working Group** to provide technical guidance and support for the use of PMUs to enhance reliability and resilience.

# What is a PMU?

A phasor measurement unit (PMU) measures **voltage, current, frequency,** and the **phase angle** between them, using precise time-synchronized measurements. PMUs typically provide 30-240 samples per second.



# Rationale

- Electricity storage resources are becoming a **material part of system operations**, requiring the same level of visibility as other major resource types.
- Most electricity storage facilities use **inverter-based technology**, which requires high-speed, time-synchronized monitoring to assess performance.
- Applying PMU data requirements to electricity storage facilities ensures a **consistent monitoring framework** across generators, transmitters, and storage facilities.

# PMUs in Ontario

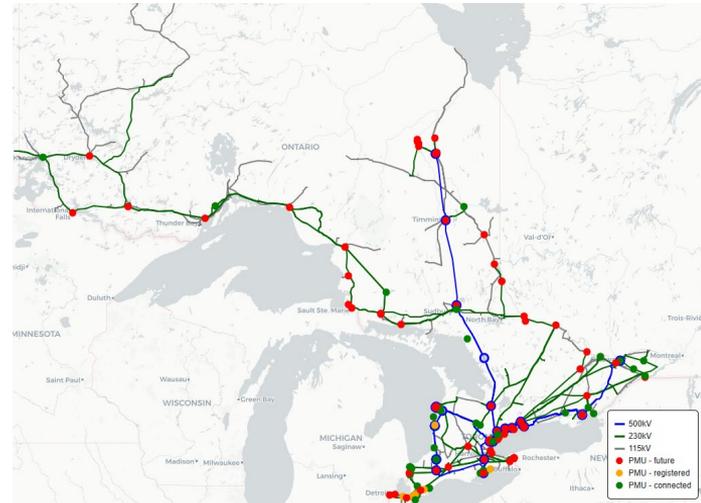
## Today

- **86** PMUs
- **36** facilities
  - 14 Wind
  - 14 Substations
  - 4 Gas
  - 2 Solar
  - 1 Hydro
  - 1 BESS



## Next 5 Years

- **240** PMUs
- **111** Facilities, with **30** of them using Inverter-Based Technology



# Overview of changes

## Market Rule amendment **MR-00487-R00**:

- Addition of **Section 7.2.1 to Chapter 4**;
- Modification to **Ch.4 App. 4.15**;
- Addition of **Synchrophasor Data Requirements table to Ch.4 App. 4.24**- IESO Monitoring Requirements: Electricity Storage Participants.

**Changes** made accordingly to **MM 1.7: Synchrophasor Data Requirements**.

## Addition of Section 7.2.1 to Chapter 4

- A provision is inserted into **Chapter 4** outlining the **obligations** market participants have relating to the **infrastructure required to support synchrophasor data**.
- These obligations previously existed in the **market manual** but are being **moved to the market rules**, as this is the appropriate place for such obligations.
- Apart from relocation, the **substantive change** is to **extend these obligations to storage resources**.

## Appendix 4.15- IESO Monitoring Requirements: Generators

Several changes are proposed to:

- The respective **measurements that should be provided;**
- Recognize **exceptions** to strict adherence to these requirements as outlined in the **market manual.**

These changes were instigated upon further review of the **market rules** while developing similar rules for **electricity storage resources.**

## Appendix 4.24- IESO Monitoring Requirements: Electricity Storage Participants

**New section** outlining **requirements for synchrophasor data** from **electricity storage resources**.

These new requirements are largely **consistent with the requirements for generators** with the exception being size:

- All **storage units connected to the IESO controlled grid greater than 20 MVA** must provide data (**vs. 100 MVA for generators**).

# Proposed Market Rule Changes

## Synchrophasor data requirements for Electricity Storage Participants

Type	Synchrophasor Data Requirements
<i>Electricity storage facility</i>	<p>For all three phases the voltage and current phasor measurements and frequency measurements, as further described in the applicable <i>market manual</i>, shall be required for each <i>electricity storage unit</i> as outlined below;</p> <ol style="list-style-type: none"><li>1. For all <i>electricity storage units</i> with a name-plate rating at greater than 20 MVA, measured from the <i>electricity storage facility</i> side of the <i>connection point</i> to the <i>IESO-controlled grid</i>.</li><li>2. For all <i>electricity storage units</i> connected to the <i>IESO-controlled grid</i> through a common <i>connection point</i> whose aggregate name-plate rating size is greater than 20 MVA, measured from the <i>electricity storage facility</i> side of the <i>connection point</i> to the <i>IESO-controlled grid</i>.</li></ol>

# Proposed Market Rule Changes

## Synchrophasor data requirements for Electricity Storage Participants (2)

Type	Synchrophasor Data Requirements
<i>Electricity storage facility</i>	<ol style="list-style-type: none"><li>3. For all <i>electricity storage units</i>, regardless of rated size, that are associated with, or have the potential to, impact an Interconnection Reliability Operating Limit, measured from the terminals defining the Interconnection Reliability Operating Limit.</li><li>4. Notwithstanding the foregoing, a <i>market participant</i> is not required to measure and provide such data when exempted from such requirement as determined in accordance with the applicable <i>market manual</i>.</li></ol>

# Overview of Market Manual changes

Summary of the changes made to Market Manual 1.7:

- **Changes to data requirements** for all market participants:
  - **Voltage and Current phasors** required for each phase;
  - **Minimum reporting rate increased** from **30** to **60** samples/sec.
- Requirements now include **Electricity Storage Participants** (Section 4).
- Added section on **PMU Connection process** (Section 6).
- **Reformat Market Manual** to post-MRP template and conventions:
  - This includes the **re-location of some requirements to the market rules** such as the need for MPs to maintain **synchrophasor infrastructure**.
- **Removed section:** Background Information for Synchrophasors and Associated Infrastructure (Previously Section 5).

Changes to the [Market Manual](#) can be found on the [Stakeholder Engagement](#) page.

# Summary of Stakeholder Feedback

- The IESO presented the **proposed market rule amendments** to stakeholders at the **December engagement**. Written feedback received in January raised **no material concerns**.
- **OPG recommended a transition period** and **early guidance** to support **market participant readiness**:
  - In response, the IESO is planning a **longer implementation window** between **Board approval** and **market rule effective date**.

Stakeholder feedback from the **Dec 18, 2025 session** with **IESO responses** can be found on the [Updates to IESO Monitoring Requirements: Phasor Data](#) webpage.

## Next Steps

- April 14, 2026 – Technical Panel (TP) vote to post
- May 12, 2026 – TP vote to recommend
- June 11, 2026 – IESO Board consideration of rule amendments
- December 2, 2026 – Effective date of amendments