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TDWG Meeting #14 Introduction

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Today's Agenda

The agenda for today's meeting is:

- Introduction materials ('housekeeping') [20 min]
- Deliverable B4: Working Terms & Definitions [20 min]
- Deliverable B1: Process & User Journey Map [1 hour]
- Deliverable A: Draft Service Stacking Protocols [1 hour]

As usual, TDWG will have an opportunity to provide feedback during and following the meeting.

Action Log

Date	Action	Resolution
Dec 8, 2023	B2 – Hydro One to follow up on use of Internet Protocol as method of communication	
Feb 16, 2024	B1 – Alectra and Toronto Hydro to follow up on flexible DER connections based on TDWG Meeting #11 feedback	Presenting May 31
Mar 28, 2024	B2 – IESO to follow up on proposed DER/A telemetry requirements based on TDWG Meeting #12 feedback	Presenting May 31
Apr 22, 2024	IESO to circulate meeting notes among TDWG members by Apr 29	Sent Apr 29
Apr 22, 2024	TDWG members to provide comments via feedback form and send to engagement@ieso.ca by May 13	
Apr 22, 2024	IESO to post all meeting materials to the TDWG webpage by May 20	Published May 20
May 31, 2024	IESO to circulate meeting notes among TDWG members by Jun 7	
May 31, 2024	TDWG members to provide comments via feedback form and send to engagement@ieso.ca by Jun 21	
May 31, 2024	IESO to post all meeting materials to the TDWG webpage by Jun 28	

TDWG Overview (Recap)

- T-D coordination is needed to better integrate distributed energy resources and aggregators (DER/A) in the IESO's wholesale market and system operations as well as in distribution networks
- Local distribution companies (LDCs), DER/A participants, and IESO will need to share information in a timely manner and ensure there is sufficient awareness (e.g., with respect to outages, limits on DER/A, and dispatch of DER/A, etc.) among the parties
- In this context, the IESO launched the Transmission-Distribution Coordination Working Group (TDWG) in 2022 to work closely with LDCs and other stakeholders
- TDWG's objective is to support the development of operational coordination protocols
- The coordination protocol(s) are expected to form the basis of new rules and/or manuals for the IESO's wholesale market that will support the DER/A participation

T-D Protocol Scenarios (Recap)

- The protocols will detail the actions to be taken and data to be shared by the parties, ensuring the effective and reliable operation as DER/A:
  - participate in IESO's wholesale market (i.e., day-ahead and real-time markets post-MRP*)
  - may provide services to the distribution system as non-wires alternatives (NWA)

- The TDWG aims to outline operational coordination for the following scenarios:

1. DER/A providing **wholesale services** as per the IESO Market Vision Project	2. DER/A providing services to the distribution system as **distribution NWAs**	3. DER/A that provide **both** wholesale and distribution **services**	4. DERs that are **not** actively **participating** in any services

* Market Renewal Program (MRP)

Past TDWG Meetings

Mtg #	Date	Major Topic(s)
1	Jan 2022	Introductory and background materials
2	May 2022	T-D definition and coordination models
3	Jun 2022	Override, outage, and IESO market processes
4	Sep 2022	New York's coordination manual
5	Nov 2022	Draft protocol for a Dual Participation model
6	Feb 2023	Draft protocol for a Total DSO model
7	Jun 2023	DSO operational functions workshop

Mtg #	Date	Major Topic(s)
8	Oct 2023	Draft Deliverables statements of work
9	Dec 2023	B2. Current state of communication B4. Definitions Workshop
10	Dec 2023	B1. Functional Assessment A. T-D Reliability for Bulk Power System
11	Feb 2024	B1. User/Process Journey Mapping
12	Mar 2024	A. Distribution Reliability Overview B2. Telemetry Requirements for DERs
13	Apr 2024	B2. IAM Communication Interfaces B3. Shared Platform Concept - Market Intel
14	May 2024	A. Draft Service Stacking Protocols B1. User/Process Journey Mapping B4. Working Terms & Definitions

TDWG Expected Deliverables

By the end of 2024, the TDWG will work to achieve the following:

Deliverable	Description	Leads	Sub-Group
A. Coordination Protocols	Develop implementation-ready protocols for three DSO coordination models (Total, Dual Participation and Market Facilitator DSO models)	IESO	Hydro One, Essex, Alectra
B1. Functional Assessment	Analyze distributors' operational functions, capabilities, and costs across multiple dimensions	Toronto Hydro + Alectra	Elexicon, Rodan, NSWG*, IESO, Powerconsumer
B2. Communication Assessment	Map coordination interfaces and data exchanges for each coordination model	Hydro One	Alectra, Essex, IESO, NSWG
B3. Shared Platform Concept	Develop concept for a "one-stop" shop data sharing platform for coordination	Alectra	Hydro One, IESO, Rodan, Powerconsumer
B4. Architectural Assessment	Assess coordination models from market design, architectural, and flexibility perspectives	IESO	Essex, Alectra, Rodan

* Non-wires Solutions Working Group (NSWG), represented by Power Advisory

Mtg #14 Feedback Questions

For A: Draft Service Stacking Protocols

1. Word document review – We invite detailed review of the draft sections of the report that were shared (this will not be posted publicly).
2. Feedback form – In your review, what are the strengths of draft report sections, and where do you see opportunities for improvement? Feel free to reference specific questions or provide general feedback.

For B4: Working Terms & Definitions

1. Is there any feedback regarding the terms defined in the Work Package 1 (Deliverable B4: Architectural Assessment) document shared?

Mtg #14 Feedback Questions

For B1: Process & User Journey Map

1. Do the user journeys detailed in the presentation comprehensively capture the necessary use cases (e.g., planning, pre-market, system conditions, etc.)?
2. Do the user journeys presented accurately reflect the necessary steps, processes, and interactions required for DSO operations and for coordination with the other parties?

Please use the feedback form found under the May 31, 2024 entry on the TDWG webpage to provide feedback and send to engagement@ieso.ca by Jun 7, 2024

Mtg #11 Feedback - Process & User Journey Map

Feedback	Response
• In future, we may have DER operating, perhaps, behind the meter, but without a capacity allocation. As we discuss DSO models, processes and procedures, we should keep in mind that these DER customers will want to be "dispatched on" as much as possible. As capacity to accept generation becomes scarce, the LDC will need to ensure that there is a methodology in place to *fairly* allocate the available capacity to accept generation. These DER will also want to understand what will influence whether they are allowed to generate, what to expect in terms of how frequently they will be allowed to/prevented from generating and have confidence that they are being treated *fairly* in comparison to other DER in their class.	• The DSO will respect and adhere to any agreements established between the LDC and DER customers by factoring in any flexible DER connection agreements as constraints in their power system analyses. The specifics and types of contracts are determined by the LDC, and the DSO will not infringe on these agreements to allow any form of DER participation unless approved by the LDC.

Mtg #12 Feedback Response

- The TDWG Meeting #12 presentation titled ***'Telemetry requirements for DERs'*** on March 28, 2024, was a part of Deliverable B2: Communication Assessment.

- The next few slides are in response by the IESO to the feedback received from working group members for the presentation.

1. Unclear Rationale for Reducing DER threshold

Feedback	Response

With respect to telemetry requirements, it is unclear what is the rationale for the proposed applicable capacity thresholds and performance requirements presented given that the there was no previous discussion of the benefits and costs or net benefits presented. It is recommended that the IESO provides this analysis prior to any further discussion on telemetry requirements.	• Telemetry requirements are only applicable to those **DER participating in the IESO Administrative Markets (IAMs)**
	• The reduced threshold was previously shared as part our Market Vison Project enhanced DER model and it is a design that the IESO is expediting the implementation as part of its Enabling Resource Program scope.
	  • A lower minimum size threshold reduces barriers to entry for smaller scaled resource
	  • This path is consistent with other US ISOs who are implementing a 100 kW minimum size for market participating aggregations per FERC Order 2222
	  • The IESO Achievable Potential Study 2022 outlined the benefits that a lower aggregation threshold would achieve given an analysis of the existing and future DER fleet

2. Unclear Applicability of Telemetry Requirements

Feedback	Response
Can you please provide more in terms of the applicability of these telemetry requirements? • Who will be accountable for the costs of these upgrades given telemetry requires investment at each DER location and potentially within the distribution network's telecommunication system. • Are there requirement applicable to new or existing DERs? • Are DERs located behind the meter required to meet these requirements?	• The telemetry proposal being brought forward are only applicable to DERs **participating in the IAMs**. • Telemetry is necessary for visibility and reliability; DER requirements are consistent with other jurisdictions • Standalone DER, or DER Aggregators **participating in the IAMs** would be responsible for the cost of these upgrades just like any IESO market participant • DERs forming an Aggregation will be recommended to provide aggregated telemetry in lieu of providing individual contributor telemetry • Under the DER Market Vision Project, DERs located behind the meter, **participating in the IAMs**, can participate as a standalone dispatchable load or a load contributor to a DER aggregation. As part of participation, such loads will need to meet the applicable telemetry requirements.

3. Clarity on Timelines

Feedback	Response
Can IESO please provide what is the anticipated timeline for implementation for the proposed telemetry requirements?	At this time, the IESO is still working on developing a detailed program plan for its Enabling Resources Program which in addition to DER integration, will also include the development of enhanced storage and hybrids models. IESO plans to share with stakeholders the details of this plan as soon as it is available. We will continue to engage with stakeholders on the topic of telemetry upgrades and other design decisions as part of the engagement for Enabling Resources Program.

4. Alternative Telemetry for Smaller DERs

Feedback	Response
• Would the IESO consider adopting another tier of Telemetry requirements (IEEE 2030.5) for smaller facilities/low performance DERs that uses internet-based protocols, or substation modernization platforms (SMP) gateways. This would help reduce costs for smaller DER. This could apply to DER between 100 kVA to 250 kVA.	Thank you for your response. The MVP has stated that aggregations >=100 kW are to adopt the existing Low/medium performance requirements. Medium performance will only require should a reliability reason materialize, and this will be assessed on a case by cases basis We will take your suggestion into consideration as we proceed into detailed design where we will be engaging more broadly with other stakeholders including the DER community.

5. LDCs and Host Distributors as Telemetry Aggregators

Feedback	Response
• Large LDCs and Host Distributors could play a significant role in telemetry aggregation as they have the IT infrastructure, tele-communication paths and IT staff to support • LDC is best position to serve as Telemetry Aggregator due to their existing telemetry infrastructure that connects to the transmitter and IESO and AMI infrastructure. Telemetry aggregator can be an extension of the core functions of LDCs	Thank you for your response and suggestion. This aligns with a point in our presentation where we said a "LDC/transmitter/third-party can assume the role of a Telemetry Aggregator."

6. Infeasible to Model Distribution Losses in EMS

Feedback	Response
• Given that there is a lot of data to accurately calculate losses in EMS from the Transmission Station to DER site, it may not be feasible to accurately model distribution losses in an EMS. An ADMS would be required. Alternatively, LDCs can provide power and generation at the various feeder points near the TD interface through stake estimation or calculated values. • It appears from the meeting that the IESO does have plans to model the distribution system but just not in detail. LDCs already model their grid and can assist the IESO on modeling the T-D interface	• Thank you for your response and providing alternative ways to better model the distribution system and obtain information on the distribution system through telemetry, given limited visibility for the IESO on the distribution system. Both DERs and the IESO will need the help of the LDCs to provide data regarding the distribution system to facilitate DERA participation in the IESO Administrative Markets. • Today, the IESO operates with a simplified model of the distribution system, which has been sufficient to help us manage reliability. We intend to continue to use this simplified model of the distribution system but may want to have additional data to enhance our visibility. We are pleased to hear that the LDCs can help assist us with modelling the T-D interface.

Thank You

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