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Conceptual T-D Coordination Protocol for Dual Participation Model

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Agenda

- Objectives
- DER(A) Service Provision Considered
 - Distribution Non-Wires Alternative Service (NWA)
 - Wholesale Market Participation
- Dual Participation Coordination Model Key Features
- Transmission-Distribution (T-D) Coordination Protocol
 - Day-Ahead Market (DAM)
 - Real-Time Market (RTM)
 - Outage Management (“Override”)

Disclaimer

- This document provides an overview of a draft concept-level T-D coordination protocol for discussion purposes and is subject to on-going revision. The posting of this document is made exclusively for the convenience of Transmission-Distribution Coordination Working Group (TDWG) and other interested parties.
- The information contained in this document and related documents shall not be relied upon by any stakeholder, prospective participant, or other interested party as a basis for any commitment, expectation, interpretation and/or design decision.

Objectives

- Present draft conceptual protocol for transmission-distribution (T-D) coordination for the Dual Participation model to facilitate
 - Integration of *dispatchable* distributed energy resources (DERs) into the wholesale market (WSM)
 - DERs providing services to the distribution system as non-wire alternatives (NWA)
- Scope limited to coordination in DAM and RTM (e.g., not registration, settlements, etc.)
- T-D coordination protocol addresses the required procedure and communication steps among the parties involved, including:
 - Independent Electricity System Operator (IESO)
 - Local Distribution Company (LDC) or Distribution System Operator (DSO)
 - Distributed Energy Resource (DER) or Distribution Energy Resource Aggregation (DERA)

DER(A) Service Provision Considered

A. Distribution NWA service

- To address peak load in certain areas of the distribution system with *constraints* in order to defer/avoid investment in network infrastructure.
- During normal operating configuration, to supply the local load behind a binding constraint of the distribution system.
 - In the distribution planning timeframe, DER(A) are selected as the solution for local load growth.
- During an abnormal planned/unplanned operating configuration, to supply the local load behind a temporary distribution system constraint.
 - In the distribution operation timeframe, there is an arrangement between LDC and DER(A).

B. Wholesale market service

- To offer available DER(A) capacity/quantities to the IESO's energy and operating reserve markets (i.e., as part of DAM and RTM).
- To act as a market participant following all applicable market rules (after Market Renewal Program (MRP) implementation).
 - *Foundational model* for DER(A) integration in "DER Market Vision Project (MVP)" expected in 2026 (post-MRP) and would only involve manageable implementation cost and complexity.
 - *Enhanced models* would involve more sophisticated participation models and would be implemented after identified criteria are met.

* Detailed distribution NWA service procedures and standards will need to be understood as part of implementation.

Dual Participation Model Key Features

- **LDC** identifies distribution NWA service needs (e.g., using distribution system planning philosophy, load forecasting mechanism, and operation criteria).
- **LDC** directs DER(A) with respect to distribution system NWA needs and maximum WSM participation.
- **DER(A)** submit dispatch data offers/bids* for DAM and RTM participation directly to the IESO.
 - DER(A) submit “LDC-directed” offers/bids with “floor price” to the IESO markets for its scheduled capacity/quantity for NWA service (i.e., this is to indicate the “must operate” MW to the IESO).
 - The “LDC-directed” offer/bid could be defined by the IESO (e.g., floor price, self-scheduled or must-operate) to address the load behind a distribution network constraint.
- **IESO** schedules DER(A) in the DAM and dispatches DER(A) in the RTM with “visibility” into DER(A) providing distribution NWA service as well.
- **LDC** is given an “override” right to remove/limit DER(A) participation in the wholesale market in case of any valid safety or reliability concern in the distribution system.

* “offer” for dispatchable generation and “bid” for dispatchable load

Pre-step - operational planning: LDC informs DER(A) of any expected limits to DER(A) operation

Timeframe: ongoing and in accordance with IESO planned outage management requirements/timeframes

From: **DER(A)/LDC**

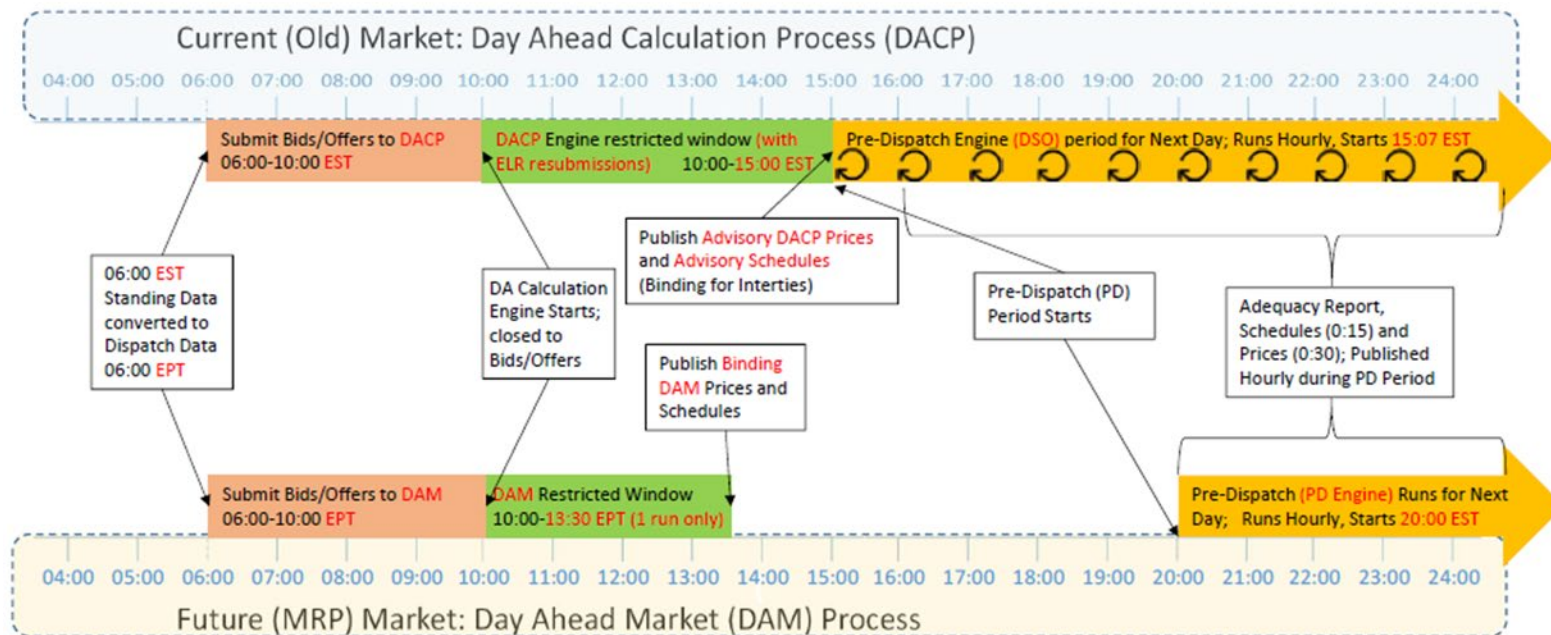
To: **LDC/DER(A)/IESO**

Requirements:

- **DER(A)** notifies LDC about any planned outage that impacts their distribution NWA service.
- **DER(A)** notifies IESO about any planned outage (with duration) that impacts their participation in the wholesale market, including any planned DER(A) outages due to distribution system planned outages.
- **LDC** communicates any planned distribution outages to the DER(A) in a timely manner. Depending on the distribution outages, LDC may only permit a DER(A) (or individual DER contributors) to operate up to a maximum capacity/quantity*.
 - If the DER(A) involves an embedded LDC and host LDC, then the outage information of both LDCs will need to be communicated to the impacted DER(A).

* LDCs will need to assess the operation of DER(A) (and individual DER contributors) at maximum capacity from a distribution safety and reliability perspective as part of the DER(A) registration and approval process.

MRP Day-Ahead Market Timing



DAM - Step 1: LDC releases distribution service schedule

Timeframe: Prior to the IESO's DAM submission deadline (e.g., by 08:00 AM, day-ahead)

From: **LDC**

To: **DER(A)**

Requirements:

- **LDC** releases distribution NWA service schedule for the next operating day, based on its assessment and identification of distribution service needs
 - **LDC** may also communicate updated limits to DER(A) permissible maximum capacity/quantity based on distribution system forced outages.
- **DER(A)** capacity remaining is permitted to participate in DAM and RTM to provide energy or operating reserve.*
 - However, if the DER(A) (including any contributor DER to a DERA) is providing a short-notice, reserve-type service to the LDC, then it cannot participate in the IESO's wholesale market.

*It is assumed that assessments have been conducted to ensure that simultaneous operation of the DER(A) at maximum capacity would not create any security issue for the distribution system.

DAM - Step 2: Offer/bid and other IESO dispatch data submission

Timeframe: DAM submission deadline (10:00 AM, day-ahead)

From: **DER(A)**

To: **IESO**

Requirements:

- **DER(A)** submits offers/bids and other dispatch data to the DAM.
- **DER(A)** submission has two parts:
 - 1) If applicable, distribution service quantity with a “LDC-directed” offer/bid (e.g., “floor price” offer)
 - 2) The remaining DER(A) capacity with price-quantity pairs
- **DER(A)** offers/bids must also abide by any limits to the permissible maximum DER(A) capacity/quantity communicated to the DER(A) participant as part of previous steps.

* “LDC-directed” offers/bids would be considered as “must operate” for distribution NWA purposes. An offer/bid at the “floor price” will ensure that the expected DER(A) operation is included in the IESO’s DAM schedules.

DAM - Step 3: DAM results are posted

Timeframe: 13:30, day-ahead

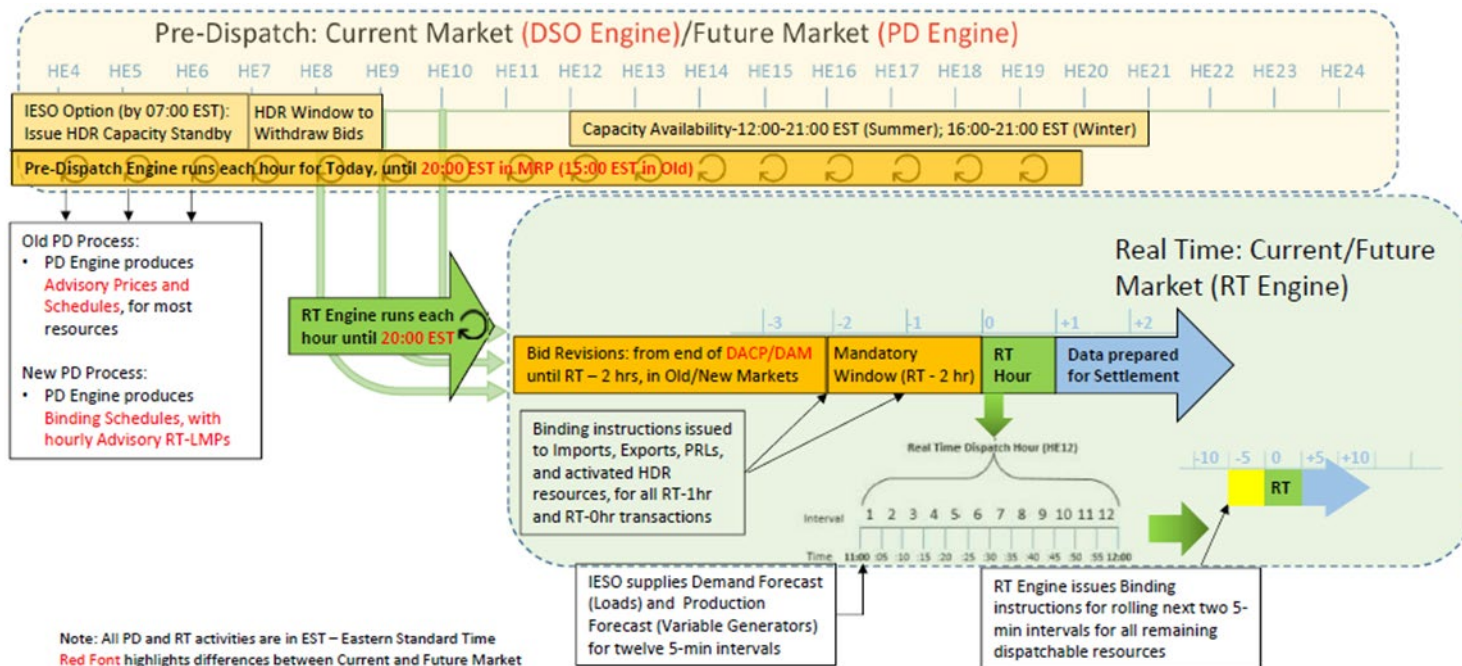
From: **IESO**

To: **DER(A) & potentially LDC**

Requirements:

- **IESO** communicates DAM schedules for the next operating day to DER(A).
- **DER(A)** might communicate their DAM results to the LDC, if required by the LDC.
 - If there is a host LDC involved, DAM results could be shared with it as well, if required.
 - In the enhanced models being explored in the DER Market Vision Project, the IESO could communicate DAM results directly to LDCs in addition to the DER(A).
- **DERA** manages/communicates the DAM schedule among their contributor DER, as appropriate.

MRP Pre-Dispatch and Real-time Market Timing



RTM - Step 1: LDC releases updated distribution service schedule

Timeframe: In advance of IESO's 2 hour mandatory window (e.g., 3 hours before the dispatch hour)

From: **LDC**

To: **DER(A)**

Requirements:

- **LDC** may ask for additional or reduced energy from the DER(A) to address the most updated distribution service needs.
 - **LDC** may also communicate updated limits to permissible maximum DER(A) capacity/quantity based on distribution system forced outages.
- **DER(A)** capacity remaining is permitted to participate in wholesale market to provide energy or operating reserve.
 - However, if the DER(A) (including any contributor DER to a DERA) is providing a short-notice, reserve-type service to the LDC, then it cannot participate in the IESO's wholesale market.

RTM - Step 2: Offer/bid and other IESO dispatch data submission

Timeframe: IESO's mandatory window deadline (2 hours before the dispatch hour)

From: **DER(A)**

To: **IESO**

Requirements:

- **DER(A)** update/submit offers/bids in the RTM*
- **DER(A)** submission has two parts:
 - 1) If applicable, distribution service quantity with a "LDC-directed" offer/bid (e.g., "floor price" offer)
 - 2) The remaining DER(A) capacity with price-quantity pairs*.
- **DER(A)** offers/bids must also abide by any limits to the permissible maximum DER(A) capacity/quantity communicated to the DER(A) participant as part of previous steps.

* According to the MRP rules, there are some restrictions around increasing the energy offer quantity (i.e., the Availability Declaration Envelope (ADE) requirement).

RTM - Step 3: IESO dispatches all resources at each market node

Timeframe: Every 5-minute real-time dispatch interval

From: **IESO**

To: **DER(A) & potentially LDC**

Requirements:

- **IESO** communicates RTM dispatch instructions and advisory dispatch information to DER(A)*.
- **DER(A)** might communicate RTM dispatch instructions to the LDC, if required by the LDC.
 - If there is a host LDC involved, RTM results could be shared with it as well, if required.
 - In the enhanced models being explored in the DER Market Vision Project, the IESO could communicate RTM results directly to LDCs in addition to the DER(A)
- **DER(A)** manage/communicate the RTM dispatch among their contributor DERs, as appropriate.

*Since LDC's distribution service request is still active and has been submitted as "LDC-directed" offers/bids, IESO's dispatch will include distribution service NWA portion plus any additional awards in the RTM.

On-going: Outage Management and “Override”

In case of any DERA forced outage that causes the DERA to become unavailable:

- **DERA** immediately submits an outage slip/notification to IESO and modifies/removes its offers/bids in the DAM and RTM.
- **IESO** captures the outage and change in the offers/bids in the next pre-dispatch run and the following real-time dispatch intervals.

In case of any distribution system forced outage that causes a DERA to become unavailable:

- **LDC** immediately informs DERA about the outage impact and duration*.
 - If there is a host LDC involved, the DER(A) must be immediately informed of forced outages to the host LDC's distribution system that causes the DER(A) to become unavailable.
- **DERA** immediately submits an outage slip/notification to IESO and modifies/removes its offers/bids in the DAM and RTM.
- **IESO** captures the outage and change in the offers/bids in the next pre-dispatch run and the following real-time dispatch intervals.

*Current market regulations concerning distribution-connected (i.e. embedded) generation and distributors' obligations are described in “Market Rules, Chapter 5, Power System Reliability”.

Feedback & Next Steps

IESO seeking the working group's feedback on the following questions:

- Does the draft conceptual T-D protocol for the Dual Participation model presented provide the opportunity for sufficient coordination among parties?
- Are there any gaps/concerns with the draft T-D protocol presented?

Please use the feedback form found under the November 9 entry on the [TDWG webpage](#) to provide feedback and send to engagement@ieso.ca by November 30

Next steps include:

- Refine draft conceptual T-D coordination protocol based on feedback from the TDWG.
- Discuss draft conceptual T-D protocol for the Total DSO model with the TDWG in the new year.
- Conceptual T-D protocols are input into informing the DER Market Vision and Design Project and expected to inform additions to IESO market rule and manual and potentially regulatory requirements (which would be discussed with the OEB).

Thank You

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