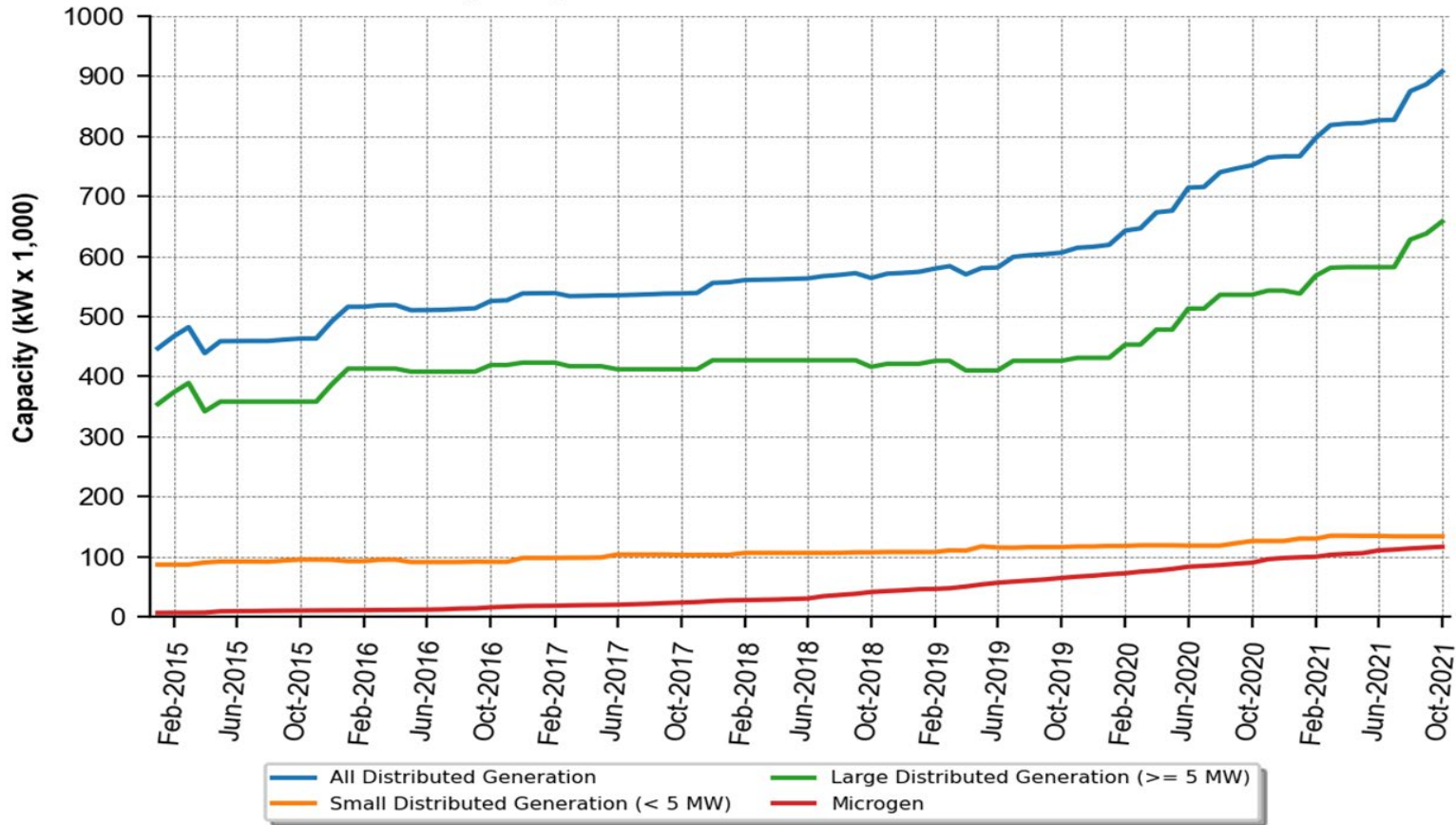


**Distributed Energy Resources  
Progress Update**  
December 21, 2021

- Quarterly progress update on AESO DER Roadmap Integration Activities:
  - DER Current State Overview
  - Update on DER Roadmap integration activities since September 2021
  - Planned activities for Q1 2022
- AESO TxDx Coordinated Planning initiative:
  - Progress on the various activities underway

## Capacity of Distributed Generation in Alberta



- Total DER installed capacity at the end of October 2021 was 908 MW
- DER penetration has a 12 month increase of 151 MW and 20% growth
  - October 2020 = 757 MW vs October 2021 = 908 MW

- Coordinated Operation (AESO Internal Activity)
  - Completed enhancement of real time operator supply/demand displays
- Technical Interconnection Requirement
  - Voltage and frequency ride-through implementation
    - Continue collaboration with DFOs to implement voltage and frequency ride-through parameters
    - The AESO is amending implementation recommendations, based on feedback collected from OEMs, DFOs, and up-to-date status of IEEE 1547-2018 adoption from other jurisdictions
      - *DER  $\geq$  150kW; December 2021 implementation*
      - *DER  $<$  150kW; December 2022 implementation*
    - Planned updated publication in early 2022

- Technical Interconnection Requirement (cont'd)
  - Islanding and anti-Islanding coordination
    - Continued targeted engagement with DFOs and TFOs
    - Planned publication of anti-Islanding guideline in Q1 2022
  - Transmission protection and control coordination – effective grounding
    - Planned publication of Guideline Paper in Q1 2022
  - Commissioning and Testing
    - AESO recommendation on DER Commissioning and Testing shared with DFOs and TFOs in November 2021
    - Plan to finalize recommendation and communicate to industry in Q1 2022

Classification	DER Roadmap Integration Activities	Priority Rank	2021 Q4			2022 Q1			2022 Q2			2022 Q3		
			O	N	D	J	F	M	A	M	J	J	A	S
Stakeholder Engagement	<b>DER Progress Updates</b> Share progress on activities, other interrelated initiatives and address stakeholder questions.				E			E			E			E
	<b>Data</b>													
Reliability	Assess and implement minimum SCADA data trigger level	H	I											
	<b>Forecasting</b>													
	Forecast DER gross generation and gross load separately (AESO internal activity)	L				C			I					
	Geographical forecast of DER sizes at the POD level (AESO internal activity)	L	Scheduled for 2023											
	<b>Modelling</b>													
	Energy storage model	H	Progress will be aligned with <a href="#">AESO Energy Storage</a> – see Phase 2 Long-term Implementation activities											
	<b>Coordinated Planning</b>													
	Enhance Transmission planning process in coordination with Transmission/Distribution (Tx/Dx) coordinated planning framework	H	Progress will be aligned with Tx/Dx Initiative											
	<b>Coordinated Operation</b>													
	Incorporate DER into net demand forecasting process (AESO internal activity)	M	Scheduled for 2023											
	Enhance real-time operator's supply/demand requirements and displays (AESO internal activity)	M	Complete											

# Looking Ahead (cont'd)

	<b>Technical Interconnection Requirement</b>																	
	Voltage and frequency ride-through requirement	H	I															
	Transmission protection and control coordination – Effective Grounding	M	C			I												
	Islanding and anti-islanding coordination	M	C			I												
	Restoration coordination	L				C												
	Commissioning and testing requirements	L	C			I												
	Cybersecurity requirements	L	C			I												
<b>Market Efficiency</b>	<b>Market Participation and Aggregation</b> Evaluate and assess options that encourage DER market participation	M	Progress will be aligned with <a href="#">DER Market Participation</a>															
<b>Tariff</b>	<b>Tariff</b> Evolve tariff framework that drives effective long-term price signals that encourage efficient use of the Tx and Dx system	M	Progress will be aligned with <a href="#">Bulk and Regional Tariff Design</a>															

DER Roadmap Implementation Phases: Analysis (A), Conception (C), Development (D), Regulatory (R) Implementation (I), Engagement (E)

DER Roadmap Priority Rank: H= High Priority, M= Medium Priority, L= Low Priority. The completed phases and planned phases outside of this [12 month](#) period are not shown.

- AESO Connection Process for DFO initiated projects
  - The AESO is reviewing workshop feedback
  - Plan to implement changes in late Q1 2022
- Coordination of AESO transmission capability assessments with DFO DER Hosting maps
  - The AESO is reviewing workshop feedback
  - Plan to publish AESO transmission capability assessments report in Q1/Q2 2022





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