Item 5.3: Grid Transformation Initiatives Update

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Technology and Security Committee Meeting

ERCOT Public
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Overview

- **Purpose**
  An update on Grid Transformation activities

- **Voting Items / Requests**
  No action is requested of the ERCOT Board; for discussion only

- **Key Takeaway(s)**
  – Initiatives are underway and progressing according to schedules

  – Activities to engage stakeholders are ongoing

Grid Transformation – Roadmaps – Work in Progress

Grid Transformation Initiatives	Modality	2024				2025			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
A) Managing the grid with large penetration of energy storage resources									
1. Evaluate the feasibility of multi-interval look ahead commitment and dispatch	White Paper	⌛	■	■					
B) Uncertainty & Variability Management									
1. Probabilistic risk assessment to support grid planning and operations	Proof of Concept	⌛	■						
C) Managing the grid with large penetration of distributed energy resources									
1. Model and receive operational information from DERs into the control room	White Paper	⌛	■	■					
2. Evaluate the value of mapping ESIIDs to actual modeled load	White paper	⌛	■						
3. Model, dispatch and settle ADER accurately reflecting the operating characteristics	Pilot Project	⌛	■	■	■	■	■	■	■
D) Evolving Ancillary Services									
1. Develop methodology for calculating dynamic ancillary service quantities	White Paper	⏱				■	■		
2. Evaluate ancillary services products for meeting future reliability issues	White Paper	⏱					■	■	
3. Develop Demand Response Product	White Paper	⏱							
4. Develop Tiered definitions of Load and assess the holistic impact	White Paper	⏱							
E) Power system dynamic security awareness									
1. Measure and estimate regional system strength	Proof of Concept	⌛	■	■	■				
2. Measure and estimate regional and system wide inertia	Proof of Concept	⌛	■	■	■				

⌛ In-Progress   ⏱ Waiting to Start   ▮ New initiatives added in July

Grid Transformation – Roadmaps – Work in Progress

Grid Transformation Initiatives	Modality	2024				2025			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
E) Power system dynamic security awareness									
3. Monitor, verify and validate load dynamic performance	White Paper	⌛	▬	▬					
F) Power system dynamic security assessment									
1. Develop frequency domain dynamic stability tool for IBR dominated grid	Proof of Concept	⌛	▬	▬	▬	▬	▬	▬	
2. Evaluate the feasibility of a new tool for accurate and efficient dynamic studies	White Paper	⌛	▬	▬					
G) Power System security assessment									
1. Develop cases with AC power flow and robust security constrained optimizations	White Paper	⌛	▬	▬					
H) Control capability to maintain system security and reliability									
1. Smart DER (including rooftop PV) management	Research Paper	⏱				▬	▬	▬	
2. Smart Load (including residential) management during emergency events	Research Paper	⏱				▬	▬	▬	
I) Emerging Technologies									
1. Evaluate AI/ML techniques for optimization problems	Proof of Concept	⌛	▬	▬	▬				
2. Identify AI/ML use cases for improving grid and market operations	White Paper	⌛	▬	▬					

⌛ In-Progress   ⏱ Waiting to Start

Grid Transformation – Sustaining the focus

- Speaker Series
  - July 26th – Dr. Hendrik Hamman, Chief Science Officer, IBM Research
  - September 12th – Dr. Tongxin Zheng, Chief Technologist, ISO-NE
  - October 4th – Robby Sohi, Chief Operating Officer, IESO
  - TBD – Dr. Anjan Bose, Regents Professor, WSU
  - TBD – Kerrick Johnson, Chief Innovation & Communications Officer, VELCO
- Periodic updates to stakeholders
  - Research Rendezvous (R^2 meetings)
- Intranet Site
  - Communications about latest advancements/articles/publications, etc.
  - Monthly Digest
- Innovation Rodeo
  - Launching a survey to gauge interest

Key Takeaway: Engage various stakeholders to sustain the focus on innovation