



## **Item 6.3: Grid Transformation Initiatives Update**

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Vice-President, DevOps and Grid Transformation

Technology and Security Committee Meeting

ERCOT Public

12/02/2024

# 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
- Focus to start implementing white paper ideas to proof of concepts
- Activities to engage stakeholders are ongoing









# Grid Transformation – Adapting to forces in the industry

- Energy Storage Resources look ahead commitment and dispatch
- Awareness of Distributed Generation operational information
- Create more opportunities to leverage Demand Flexibility
- Monitor, verify and validate Load Dynamic Performance
- Leverage the Smart Meter data for edge intelligence
- Develop techniques to run robust Security Constrained Optimizations
- Leverage Artificial Intelligence advancements

# Grid Transformation – Roadmaps – Work in Progress

Grid Transformation Initiatives	Modality	2024				2025				
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
<b>A) Managing the grid with large penetration of energy storage resources</b>										
1. Evaluate the feasibility of multi-interval look ahead commitment and dispatch	White Paper									
<b>B) Uncertainty &amp; Variability Management</b>										
1. Probabilistic risk assessment to support grid planning and operations	Proof of Concept									
<b>C) Managing the grid with large penetration of distributed energy resources</b>										
1. Model and receive operational information from DERs into the control room	White Paper									
2. Evaluate the value of mapping ESIDs to actual modeled load	White paper									
3. Model, dispatch and settle ADER accurately reflecting the operating characteristics	Pilot Project									
<b>D) Evolving Ancillary Services</b>										
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									
<b>E) Power system dynamic security awareness</b>										
1. Measure and estimate regional system strength	Proof of Concept									
2. Measure and estimate regional and system wide inertia	Proof of Concept									

# Grid Transformation – Roadmaps – Work in Progress

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

# Grid Transformation Initiatives – Thank You !!

## Grid Operations

Fred Huang – Director, Operations Support  
Jeff Billo – Director, Operations Planning  
Jimmy Zhang - Principal, Inverter based Resources  
Luke Butler – Manager, Resource Forecasting  
Nitika Mago – Sr. Manager, Balancing Operations  
Riaz Khan – Sr. Ops Engineer, Resource Forecasting  
Sienna Shi – Ops Engineer, Resource Forecasting  
Vamsi Madam – Manager, Ops Engineering

## Commercial Operations

Sai Moorthy – Principal, Market Design & Analysis  
Kenneth Ragsdale – Principal, Market Design  
Dave Maggio – Principal, Commercial Operations  
Gordon Drake – Director, Market Design & Analysis

## Grid Planning

Bill Blevins – Director, Grid Coordination  
Jose Conto - Principal, Dynamic Studies  
Prabhu Gnanam – Director, Grid Planning  
Sun Wook Kang – Manager, Dynamic Studies  
Thinesh Devadhas Mohandas – Principal, ET  
Tareq Hossen – Engineer, Planning

## Enterprise Architecture

Weihui Fu – Principal, System Development

## Grid Transformation

Prashant Kansal – Principal

**Key Takeaway: A collaborative effort among several teams**

# Grid Transformation – Sustaining the focus

- Speaker Series
  - September 12<sup>th</sup> – Dr. Tongxin Zheng, Chief Technologist, ISO-NE
    - Clean Energy Transition: Challenges and Opportunities
  - October 4<sup>th</sup> – Robby Sohi, Chief Operating Officer, IESO
    - Cultural Transformation
  - October 24<sup>th</sup> – Daniel Nelson, Chief Technology Officer and Dan Kopin, Manager of Innovation, Vermont Electric Company (VELCO)
    - Trusted Trio: Transmission, distribution and generation data
  - November 8<sup>th</sup> - Dr. Anjan Bose, Regents Professor, WSU
    - Evolution of Grid Operation and Control
  - **December 13<sup>th</sup>** – Xavier Florent, Director of R&D Partnerships, Valorization, Transformation and Cross-Program Strategies (PRISME), RTE- France
    - Energy pathways in France and R&D activities

# Grid Research, Innovation, and Transformation (GRIT) - Activities

## Finding home

GRIT Intranet Site  
GRIT External Website

## Research & Innovation Engagement

Industry Consortia  
Academic Institutions and DOE  
Grid Transformation Quarterly

## Communication

Research Rendezvous Meetings  
Newsletter (Monthly)  
Report (Annual)  
*Innovation Summit – May 6, 2025*

## Implementation focus

Ideation Workshop  
Whitepapers to Proof of Concepts  
Multiple POCs in pipeline