

# Summary of Sessions and Roundtable Takeaways

TO&P Fall Advisory



Aug 31 - September 2 2026

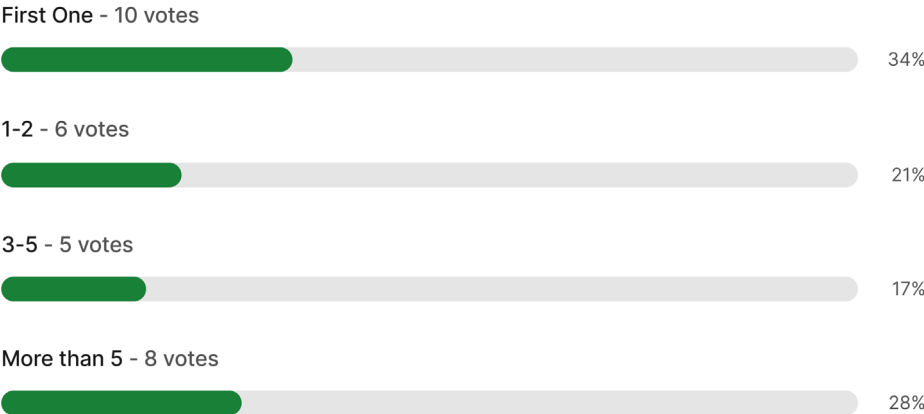


# Recap of Roundtable and Other Takeaways

# Meeting demographics

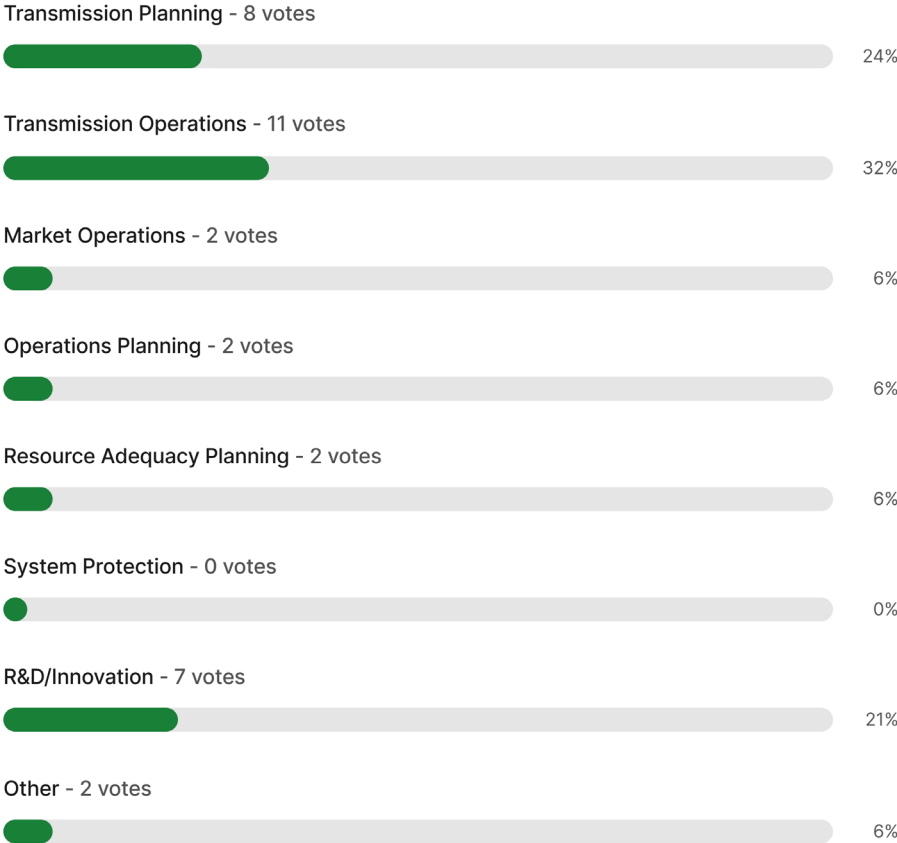
## How many TOP Advisory meetings have you been at?

Multiple Choice Poll 29 votes 29 participants



## What functional area do you work in?

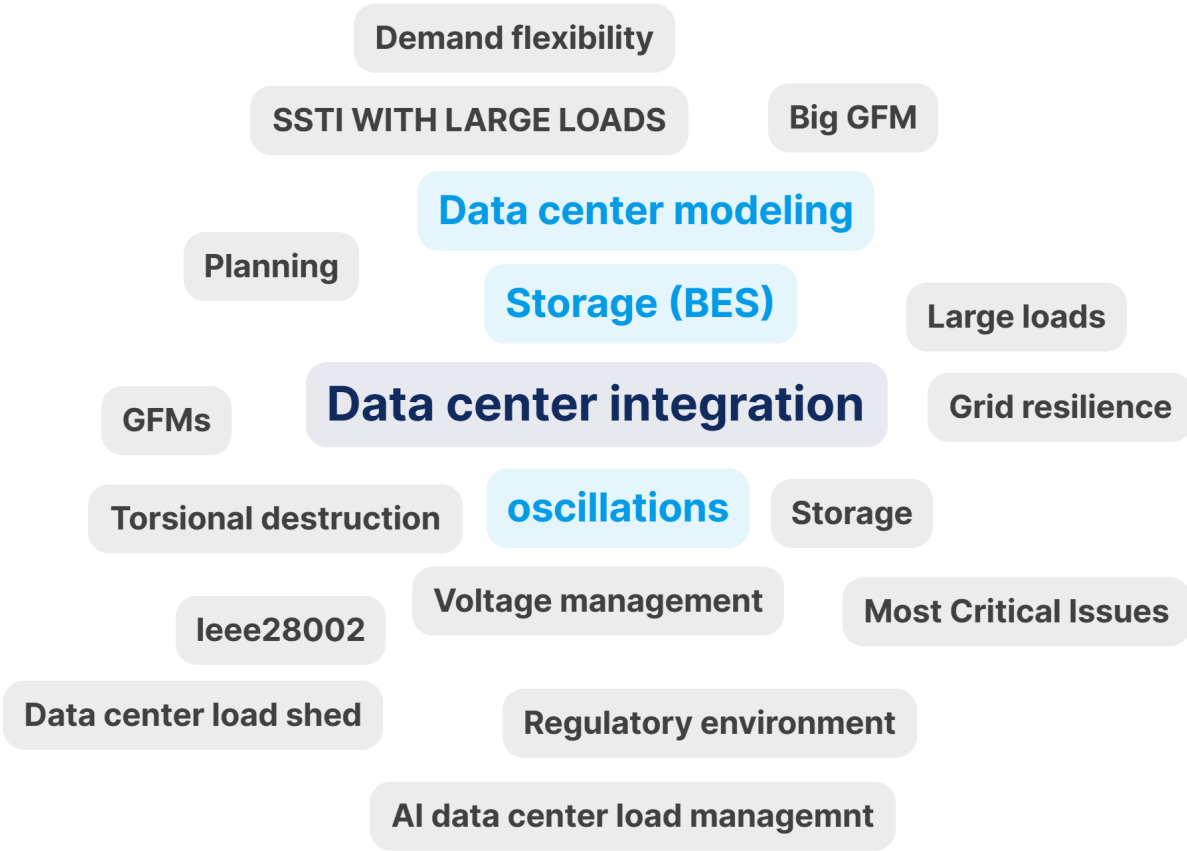
Multiple Choice Poll 34 votes 34 participants





# What topic are you most excited to hear about this week?

Wordcloud Poll   30 responses   23 participants



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# Large Loads and Data Center Integration

***Member priority:*** Integrate rapidly growing data center loads without compromising reliability or cost transparency

## **Key subtopics**

- Voltage and frequency ride-through
- Sudden load loss, UFLS, and reserve requirements
- Interconnection studies, requirements, and timelines
- Transmission upgrades and cost allocation
- Flexible demand, curtailment, and co-location
- Transmission versus distribution-connected loads
- Reliability services from large loads
- Flexible interconnection pathways

## **EPRI R&D**

- DCFlex efforts on all topics
- Modeling and studies for VRT, oscillations (40A, 40D, 173A, Board Working Group)
- Reserve sizing (173B)
- Hosting capacity and interconnection studies (40C, QUEST, DOE GridCare, etc.)
- Flexibility (Flex MOSAIC, 173C, etc.)
- Headroom analysis in DC Flex

# IBR Integration, Oscillations, and Stability

***Member priority:* Detect and manage emerging stability risks as IBRs and large loads reshape system behavior**

- Oscillations
- IBR, data center, and grid-device interactions (SSTI, etc.)
- Harmonics and system strength
- PMU data quality, sampling, and storage
- Equipment models (EMT, RMS)
- Grid-forming resources and weak-grid operation
- Ride through testing and compliance
- Equipment-level versus POI-level performance
- Standards and compliance

## EPRI R&D

- Oscillation studies in planning (40D, 173A)
- Oscillation detection and mitigation in operations (39E)
- EMT modeling guidance and tools (40D, 173A, 40A)
- IBR-ID for GFM modeling/analysis; IBR-CA for conformity assessments; EMT AREA for EMT modeling guidance (173A)
- PMU and other monitoring (39E)
- GFM modeling and analysis (173A)
- Oscillation workshops (P39)
- Engagement in standards and model management
- Conformity assessment support

# Planning and Operations in a Faster, More Dynamic Grid

***Member priority:*** Close the gap between planning assumptions, operating conditions, and increasingly interconnected systems

- Translation of planning decisions into operations
- Model and control-setting management
- Transmission-distribution coordination
- Voltage and reactive-power management
- Right of way with multiple lines
- Multiterminal HVDC integration
- Operations planning for large loads and IBRs
- Continuous model management
- 765kV in planning and operations

## EPRI R&D

- Integrated transmission-distribution analysis (173A/40A)
- Voltage management (39B)
- Operations planning tools and methods (39D)
- Model management and validation (40A, 173A, 40D, 39D)
- Coordination across operations and asset management (upcoming 39 joint effort)
- RADAR Project
- HVDC integration (39B, 40E)
- GETs integration (GETSET, 40E, 246)
- ***Short paper on ROW issues?***
- 765kV efforts across ops and planning

# Resource Adequacy, Flexibility, and Reliability

***Member priority:*** Maintain adequate and dependable resources amid rapid load growth, retirements, and forecast uncertainty

- Evolving load forecasts and large-load uncertainty
- Resource retirements and replacement constraints
- Resource accreditation and dependable performance
- Backstop procurement and interim capacity mechanisms
- Demand response and locational load curtailment
- Ramping products, ancillary services, and reserve sizing
- Risk identification frameworks
- Scenario-based planning
- Situational awareness and defense strategies

## EPRI R&D

- Resource-adequacy and production-cost modeling (173C, 246, 173B)
- DCFlex and large-load flexibility analysis
- Reserve-sizing methods (173B)
- Emerging-technology performance research across PSETs
- GETSET support for regulatory engagement
- Future market designs (246)
- RADAR and Safe-T Net risk framework

# Workforce, AI Tools, and Decision Support

***Member priority:*** Equip planners, operators, and decision-makers for a grid changing faster than traditional practices

- Training for new and less-experienced operators
- Hands-on training for new tools and procedures
- AI competency for planners and operators
- AI assisted workflows
- Trusted and auditable AI
- Consistent terminology across stakeholders
- Regulatory and governance decision-making
- Public acceptance of transmission development
- Knowledge transfer from R&D into practice

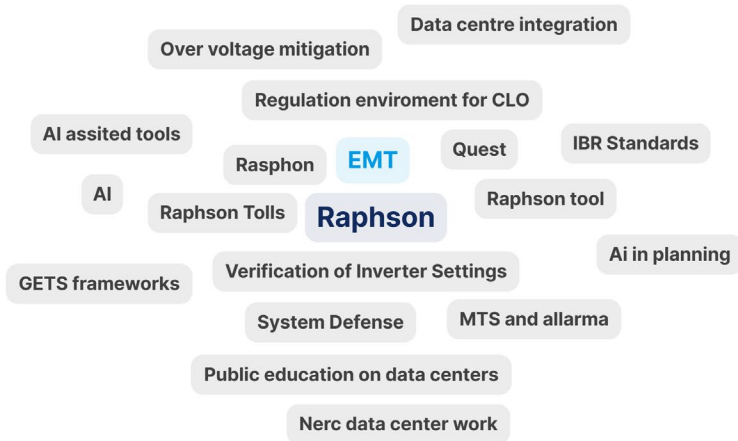
## EPRI R&D

- RADAR for managing changing grid
- Operations training and procedure-based learning
- AI for planning (Raphson, QUEST, AI in PCM competition)
- AI for operations (MTS, Allarma)
- GETSET regulatory and stakeholder resources
- Community-engagement research for transmission expansion (future?)
- SaferAI.power effort (cross EPRI)

# Feedback from Members

 What topics were of most interest to you this week?

Wordcloud Poll   26 responses   17 participants



 What additional feedback do you have (meeting logistics, topics to cover in future, quick insights we can develop in coming months, etc.)?

Wordcloud Poll   9 responses   9 participants



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# Things to Look Out For

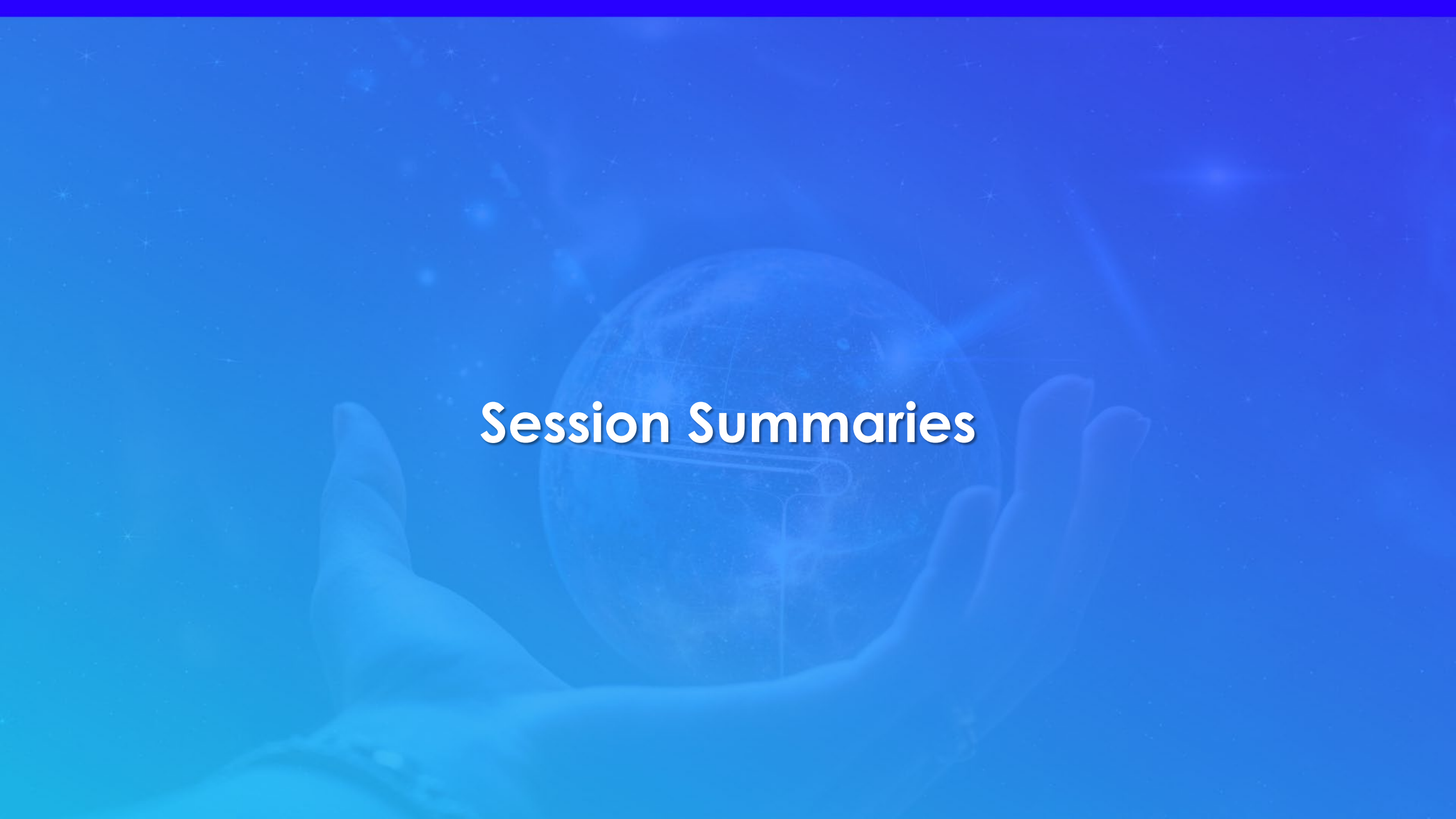
## New efforts getting underway

- Voltage Ride Through
- EMT modeling/model management
- QUEST AI effort and Grid Care effort
- Action plans and potential recalibration of programs → as a clear line to address most pressing challenges to EPRI's research areas and priorities
- Potential – increased engagement on supporting discussions with regulators, policy
- Transmission utilization topic (white paper)

## Continued big efforts

- Data centers/large loads – DC FLEX
- Grid Forming/IBR integration
- GETs – GETSET and application of tools
- RADAR – risk management, capability mapping and tools/training needs
- AI tools for Ops and Planning
- View from the TOP, PSSO Forum, RA forum and other engagements

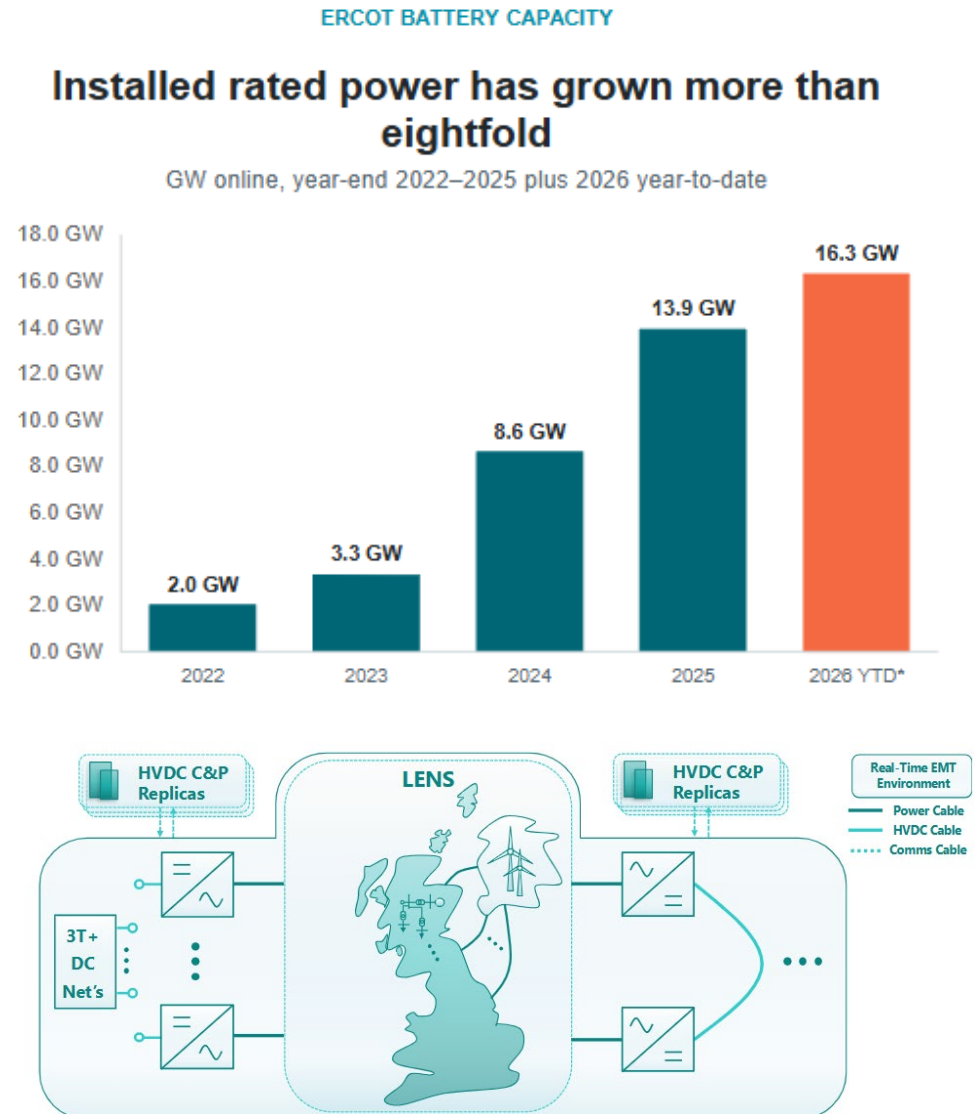
**And more...**



# Session Summaries

# Unlocking Grid Services from IBRs: Procurement, Performance, and Validation

- Speakers
  - Joharath Kutty, NYPA, Ryan Tumilty, SSEN
  - Bin Wang, ISONE, Ryan King, ERCOT
- Takeaways
  - With increased IBRs, there is going to be a requirement for more services to be provided by these resources
  - Evaluation of capability and ensuring stable behavior can involve the use of large scale EMT simulation environments
  - There may however be a need to re-think our notions of services and requirements from IBRs
  - This could also require the development of a market/incentive structure to pay for the services.



# From Data to Decisions – P39/P161 Joint Session

- **Moderators:** Eric Hatter, Sean Crimmins
- **Presenters:** Lilia Murphy (SRP), Ebby John (CenterPoint), Sean Crimmins/Mahendra Patel (EPRI), Ben Ealey (EPRI)
- **Session Highlights:**
  - ✓ Lilia Murphy discussed SRP tool to assess IBR asset performance during voltage disturbances using multiple data sources to identify potential non-ride-through disturbance for further review and action. This is being expanded for use on data center disturbances.
  - ✓ Sean Crimmins/Mahendra Patel presented on the EPRI Disturbance Data Platform work and next steps.
  - ✓ Ebby John presented on CenterPoint Energy's challenges associated with renewable generation and large load interconnection requests and their growing impacts on voltage unbalances and their growing monitoring requirements to ensure generator.data center compliance.
  - ✓ Ben Ealey gave a brief overview of the DC Flex project and discussed upcoming WS 2.2 activities and potential use cases required for a communications and automation interface between utilities and data centers.

**The session highlighted the needs and potential methods of providing operational insights related to IBRs and large loads to maintain system stability and reliability. Four utilities (SRP, FE, Excelon and CenterPoint) expressed interest in learning more about the Disturbance Data Platform concept.**

# Carousel Presentations



## 765kV Planning Topics & Operational Challenges

Overview of new 765kV value, adoption, and EPRI support research



## Monitoring Utilizing Synchronous Point-on-Wave

Strategies for capturing fast system phenomena and use cases



## Grid Enhancing Technologies Value Proposition

Case study overview and generalized results utilizing GETS in place of traditional planning solutions



## Generation & Load Interconnection Practices and Enhancements

Present practices and overview of EPRI research on enhancements, particularly around optimized hosting capacity



## RADAR Project Overview

Discussion of risk framework development for operations and planning, including overview of the Safe-T Net tool and RADAR project work streams



## EMT AREA Software Demo

Overview of EMT need identification and study region determination process, implemented and automated in the EMT AREA tool

# Voltage and Reactive Power Management

- Recent grid events underscore increasing voltage and reactive power management risks.
- Utilities need tighter integration between planning studies and real-time operations.
- ERCOT is developing advanced multi-hour AC security and Volt/var optimization capabilities.
- NYPA is successfully applying EPRI [VCA Studio](#) in operational planning workflows.
- Future solutions must balance automation with operator trust and transparency.
- Industry R&D should focus on IBR integration, dynamic var support, AI-enabled tools, and multi-horizon voltage security

***EPRI R&D work help bridge research and operations, delivering the tools and insights needed for voltage security in the evolving power grid***

## Panel Session: Voltage and Reactive Power Management

ED&CS Advisory & Sector Council Meetings | Transmission Operations and Planning

National Harbor, MD | August 31 - Sept 2, 2026

### Moderator

**Alberto Del Rosso** - EPRI | Transmission Operation & Planning

### Panelists

**Arif Hossain, Frank Grimaldi, Xi (Michael) Chen**

NYPA | Operations Planning

*Implementation of EPRI VCA Studio in Operations Planning*

### Weihui Fu

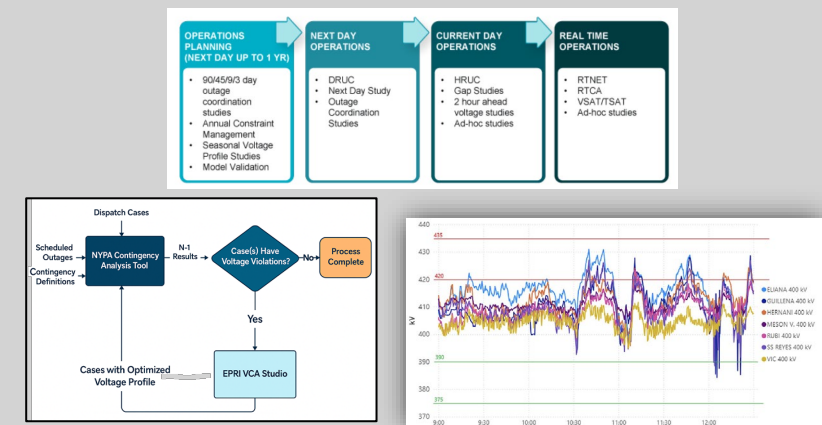
ERCOT | Grid Research, Innovation, and Transformation

*Voltage Control and Volt-VAR Optimization in a Changing ERCOT Grid*

### Razvan Pabat-Stroe

EPRI | Transmission Operation & Planning

*Voltage Control Challenges During Recent Large Disturbances*



# Program Summaries, Action Plans and Program Realignment

- Overview of each program and plans for 2027
  - Changes to P39 titles and minor focus area changes
  - P40 – move ARTS from 40E to 40C and add reactive power planning to 40E
  - P173 – dropping tech transfer PSET; P246 – no changes
- Action plans (see next slide)
- Potential program realignment
  - Discussed current challenges with members ability to clearly see what topics are covered where
  - Potential to change how programs are structured in 2028 and beyond
  - EPRI to develop plan to share at next advisory

|                                                  |                                                           |
|--------------------------------------------------|-----------------------------------------------------------|
| Stability Modeling & Analytics<br>40A, 173A, 40D | Protection and Control<br>40B, 173A                       |
| Flexibility and Balancing<br>173B, 39E           | Resource Adequacy<br>173C                                 |
| Power Quality<br>40D                             | Operations Planning & Reliability Coordination<br>39B,39D |
| Transmission Planning<br>40C, 40E, 39B           | Emergency Operations<br>39C                               |
| Market Design and Operation<br>246               | Real Time Operations<br>39A, 39E                          |

Action plan areas

Contact EPRI ([atuohy@epri.com](mailto:atuohy@epri.com)) to get engaged in action plan development this year!

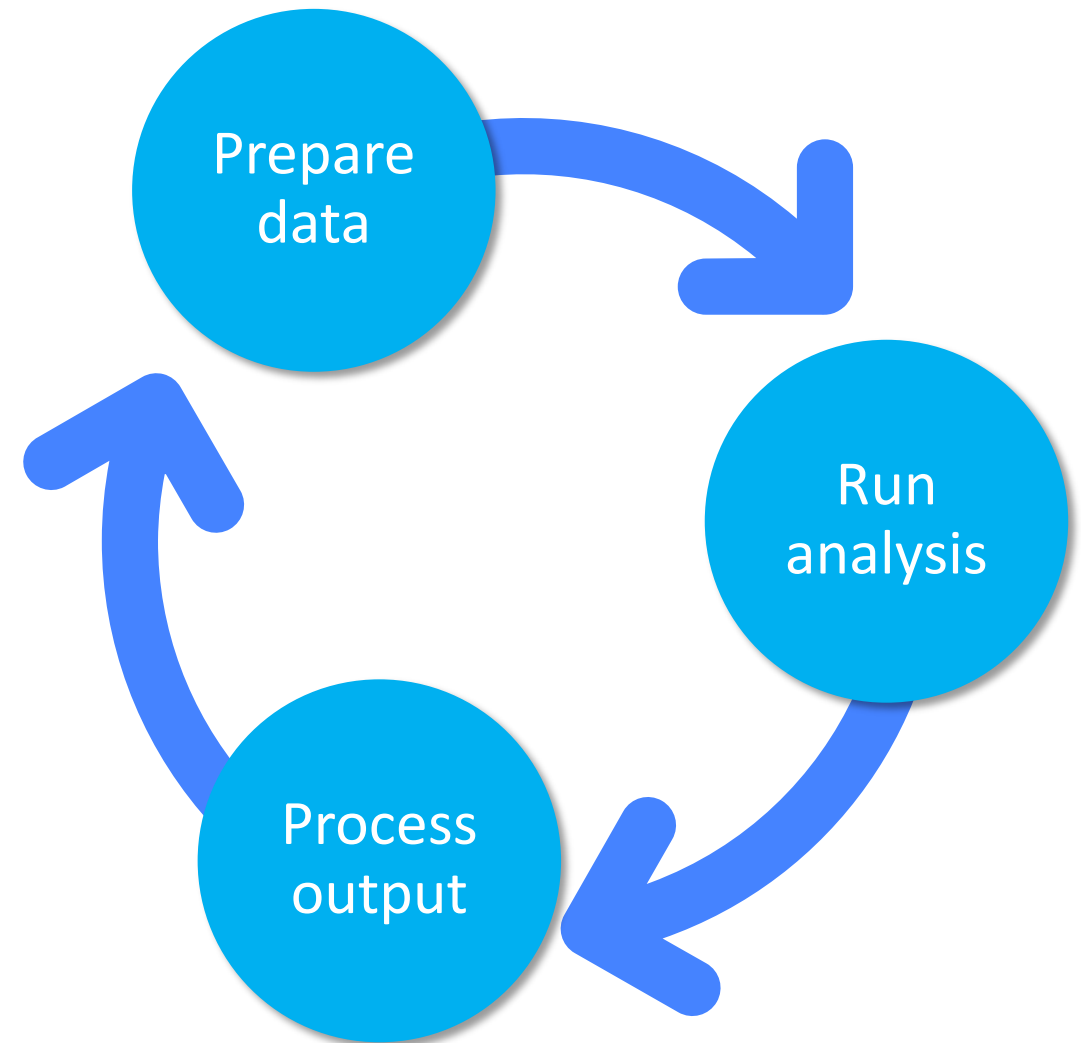
# Action Plans Session Summary: Connecting Member Needs to Long-Term Research Value

- **WHAT?** -- A living, member-informed framework that connects past learning, current research, and emerging opportunities into coherent research plans
- **MEMBER NEEDS & EMERGING CHALLENGES**
  - | Pain points | Technical gaps | Industry changes | New opportunities |
- **RESEARCH DIRECTION**
  - Vision & Mission → Strategic Domains → Idea Pool → Prioritization → Roadmap
- **MEMBER VALUE**
  - Clear visibility into past, current, and future research
  - Stronger connections among projects, deliverables, and capabilities
  - Priorities driven by member relevance, technical impact, strategic value, and feasibility
  - Adaptable near-, mid-, and long-term research pathways
  - A more coherent and navigable research portfolio
- The objective is to identify **the topics that matter** and build the capabilities members need

**YOUR INPUT SHAPES THE DIRECTION** → Help identify the right problems, prioritize opportunities, and ensure that future research reflects your organization's needs

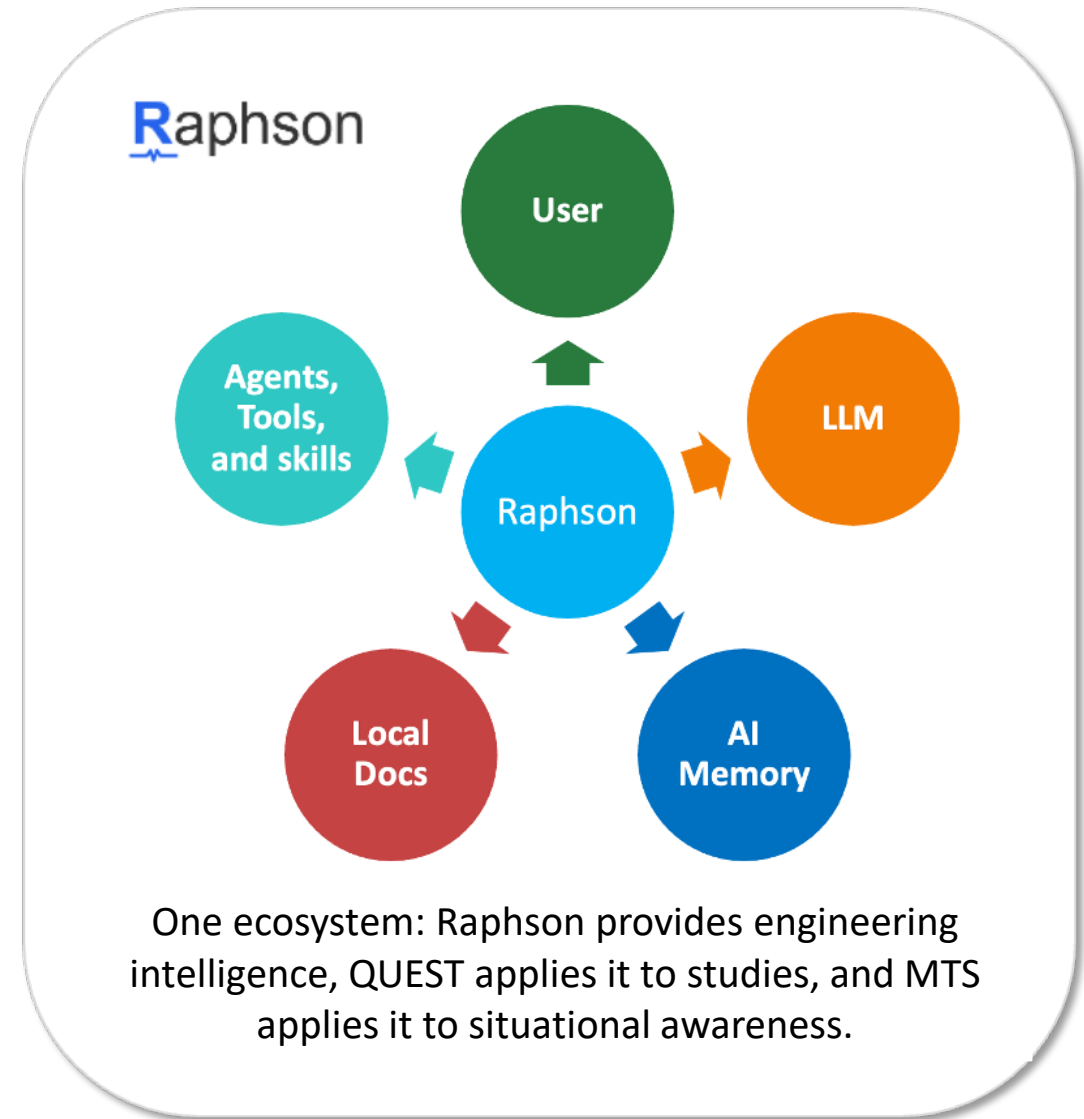
# The Opportunity for AI in Grid Operations & Planning

- **Engineering work is tool-heavy and repetitive**
  - Preparing data, running analyses, processing output, and building decision-ready reports span many tools and manual handoffs.
- **Automating a single simulation is not enough**
  - Interconnection and planning require coordinated analyses, scenario evaluation, mitigation, and comparison of candidate investments.
- **Operators face information overload**
  - Separate GIS, weather, outage, asset, and market applications are data-rich but insight-poor.



# An Integrated EPRI Agentic AI Framework

- **Raphson AI Assistant** – the orchestration layer: connects users and LLMs with engineering documentation, knowledge, simulation software, scripts, data, and specialized agents.
  - Built on tools that perform actions, skills that define how to use and interpret them, and agents that combine both to complete workflows; results are stored and catalogued for learning.
- **Queue Evaluation for Strategic Transmission (QUEST)**
  - Raphson applied to planning studies: links queue-application processing with interconnection impact assessment, orchestrating EPRI and commercial tools to identify strategic transmission needs for new generation and large loads.
- **Monitoring the Situation (MTS)**
  - Stand-alone tool for operational awareness: unifies network topology, weather, infrastructure, outage, and market data in one view, with an agentic interface to query and correlate datasets by natural language.



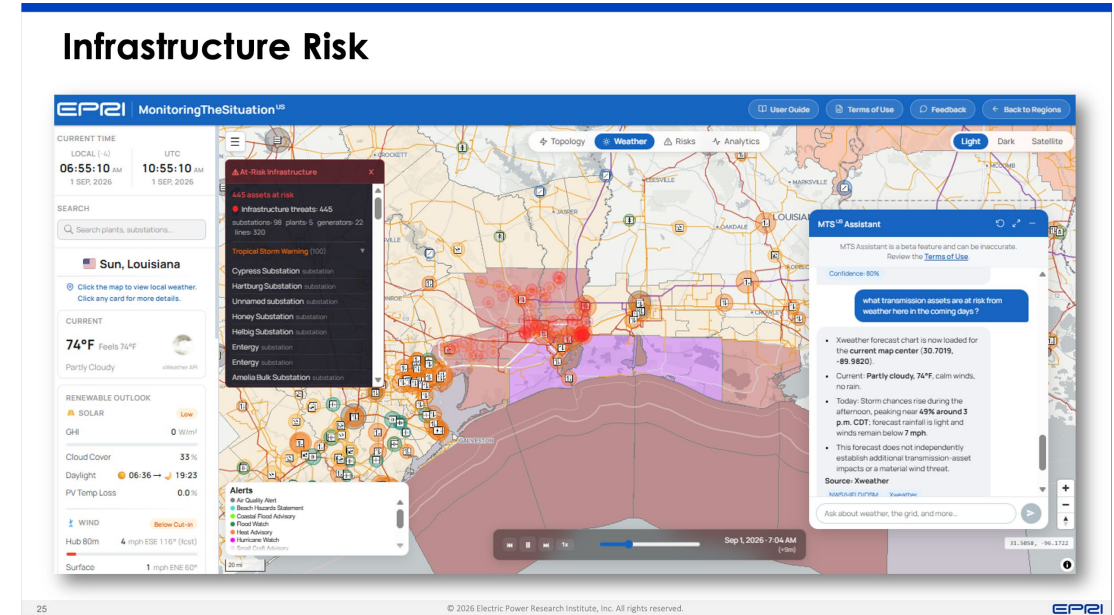
# Demonstrated Progress & Path Forward

- **Engineering automation using an Agent**

- Raphson configures and runs contingency analysis, resolves overloads and errors, and converts existing Python scripts and external APIs into reusable tools.

- **Integrated interconnection analysis**

- Leverage existing EPRI tool capabilities alongside commercial tools to develop in an improved, intelligent, interconnection assessment process



**MTS** answers natural-language questions on assets, weather, wildfire risk, forecasts, and outages, with CITE-AI providing verifiable evaluation of agent and model performance.

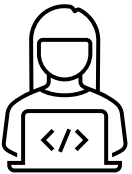
**Aim is to expand EPRI and commercial tool coverage, strengthen data exchange across agents, build QUEST case studies, and extend MTS data layers, guardrails, and secure deployment.**

# Keeping Up to Date on our Research



In  
Person

| February                                                                                                                                                              | March                                                                                                                                        | September                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <p>Winter Advisory</p> <ul style="list-style-type: none"><li>• Feb 22-25, Charlotte, NC</li><li>• Tech Transfer and Peer Learning</li></ul>                           | <p>Europe Week</p> <ul style="list-style-type: none"><li>• Tech Transfer and Peer Engagement</li><li>• European Member Focus</li></ul>       | <p>Fall Advisory</p> <ul style="list-style-type: none"><li>• Sept 13-16, Arlington, TX</li></ul>                                |
| February/March                                                                                                                                                        | June-Oct                                                                                                                                     | November/December                                                                                                               |
| <p>Kickoff Webcasts</p> <ul style="list-style-type: none"><li>• Refine research plans by gathering feedback from members and/or voting on research projects</li></ul> | <p>Mid-Year Webcasts</p> <ul style="list-style-type: none"><li>• Share status updates and initial results from the year's research</li></ul> | <p>End of Year Webcasts</p> <ul style="list-style-type: none"><li>• Results and key findings from the year's research</li></ul> |
| Throughout: Status updates by email, staff available at any time!                                                                                                     |                                                                                                                                              |                                                                                                                                 |



Virtual

# ED&CS Fall Advisory and Sector Council Meetings

September 13 -16, 2027

Loews Arlington Hotel  
888 Nolan Ryan Expressway  
Arlington, TX 76011

[Add to Calendar](#)





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