



Item 8: ERCOT Project Portfolio Overview

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Special Board of Directors Meeting

ERCOT Public

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ERCOT Project & Portfolio Process

Adam Martinez, Director, Enterprise Architecture

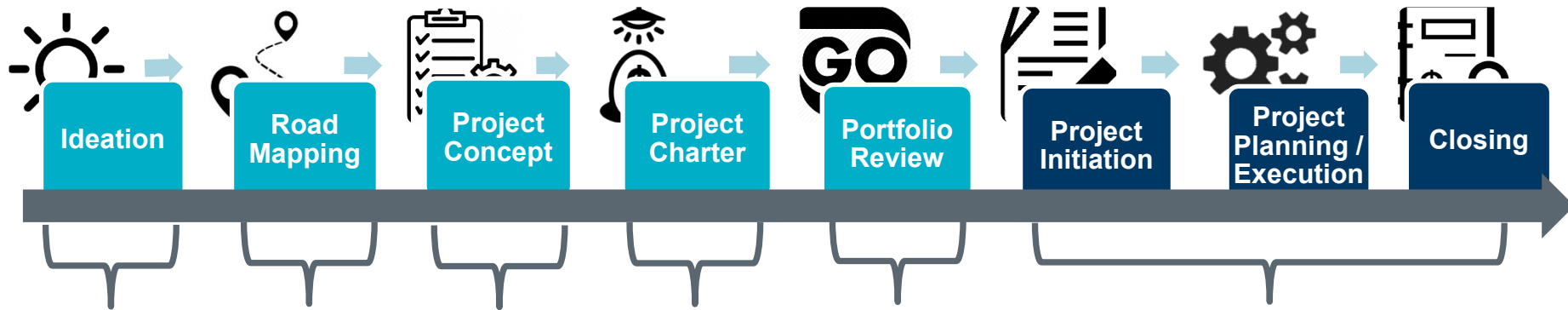
Troy Anderson, Senior Manager, Portfolio Management

Bridging Corporate Strategy & Delivery

- ERCOT utilizes a combination of strategic, planning, architecture and delivery services to bridge Business and IT capabilities.
- These services provide rigor to the process of identifying, evaluating, prioritizing and delivering “what we do.”
- The process also drives accountability & empowerment, promotes early risk identification & mitigation, provides for increased transparency & sharing, and focuses on the efficient use of ERCOT resources.



ERCOT's Project Chartering Process



- Initial idea development

- Determine proposed timing & prioritization
- Road Map Dashboard

- Development of objective, background, strategic alignment, benefits, scope & risks

- Develop the Impact Analysis, resource & system impacts, high level requirements

- Executive prioritization
- Approval to proceed

- Official project initiation by the Project Management Office (PMO)
- Project Phases
 - Initiation
 - Planning
 - Execution (includes Go-Live)
 - Closing
- Operational Support hand-off
- Lessons Learned

2022 OKR Projects Update

Mandy Bauld, Senior Director, PMO

Improve Grid Reliability

Project	Objective	Budget	Key Milestones
Distribution Generation Resource / Distribution Energy Storage Resource (DGR/DESR) Implementation	After a 2-year moratorium, resumes and improves integration of DGR and DESR into ERCOT systems and markets.	\$1.4M	Initiated: October 2020 Planning Complete: July 2021 Lift DGR Moratorium: Jan 2022 System Go-Live: Feb 2022 DGR/DESR resources become active in model/market: April 2022
Battery Energy Storage (BES) Combo Model Implementation	Implementation various improvements to the “combo model” interim solution that allows batteries to connect and participate in ERCOT while the battery is represented in ERCOT systems as both a Generation Resource and a Controllable Load Resource. Note the long-term goal is a single “energy storage resource” device in the model (NPRR1014). Project is currently on-hold until resource constraints with the DGR/DESR, NPRR1093 & FFRA Implementations resolve.	\$727k	Initiated: October 2021 Put On-Hold: August 2021 Target Restart: TBD-2022
Energy Management System (EMS) Upgrade	Upgrade the EMS and the Operator Training Simulator (OTS) to the most current vendor versions. Periodic upgrades are required to remain on standard vendor supported software and minimize the legacy support service.	\$27M	Initiated: October 2019 Early Development Phases 4-6: Jan 2022-June 2022 Full Planning Complete: June 2022 Target Go-Live: June 2024

Complete market-facing initiatives advancing reliable operations, market systems and data transparency

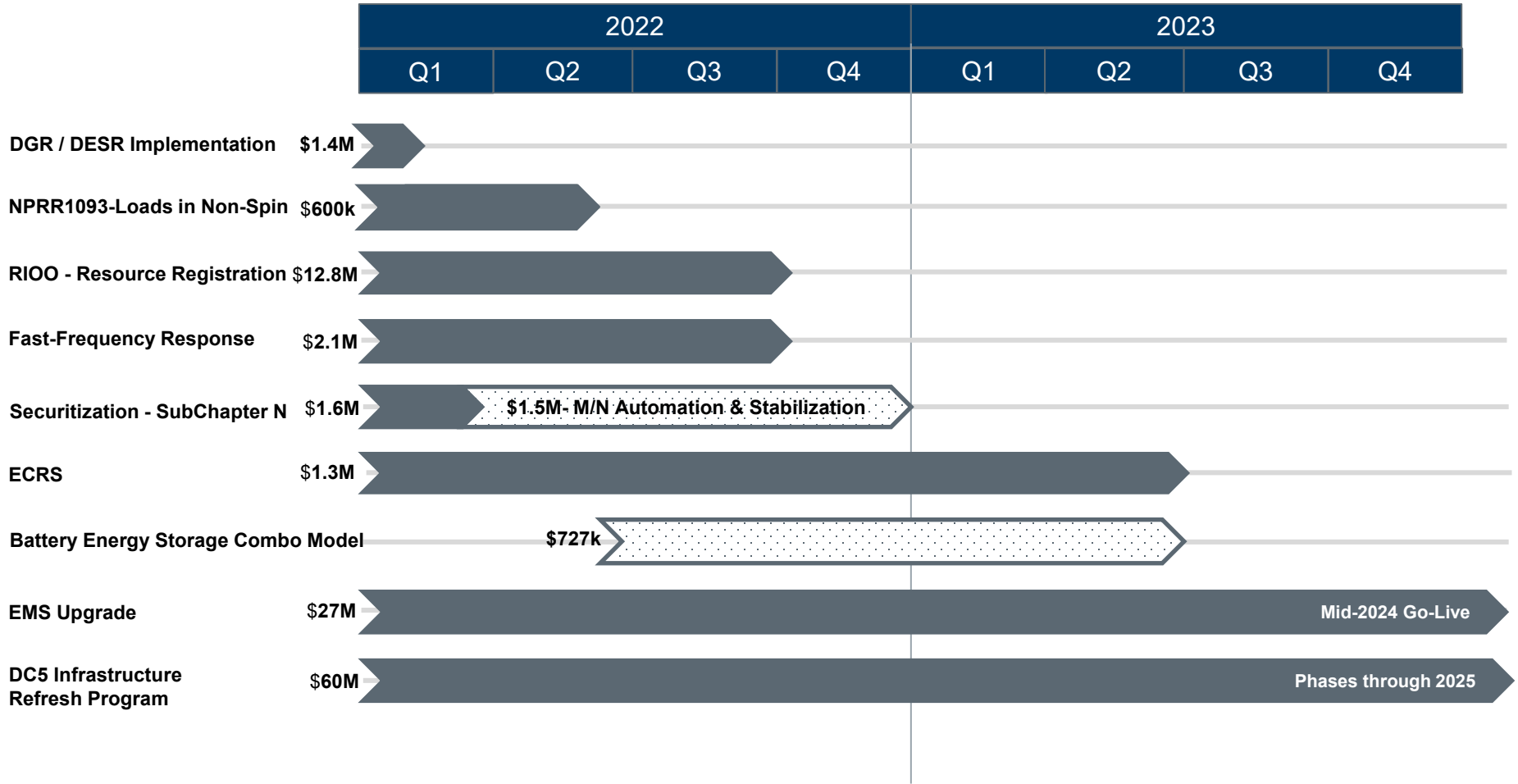
Project	Objective	Budget	Key Milestones
Resource Integration & Ongoing Operations (RIOO)	Implement an application that supports resource asset registration data management enabling retirement of the Resource Asset Registration Form (RARF) spreadsheets and associated manual processes.	\$12.9M	Project Reset: Feb 2019 First Major Release: Sep 2020 Last Major Release: TBD-2022
Fast Frequency Response (FFR) Advancement	Implement changes to improve and co-optimize FFR capability across multiple Ancillary Service products (Regulation, Responsive, Online Non-Spin). Provides more flexibility to Market Participants and permits a more effective and efficient permanent implementation in the Energy and Market Management Systems. Supports PUCT market design directives.	\$2.1M	Initiated: February 2021 Planning Complete: June 2021 Original Go-Live: Dec 2021 Postponed Go-Live: TBD (potentially Oct 2022)
Load Resource Participation in Non-Spinning Reserve (“NPRR1093”)	Implement changes to expand the Non-Spin Ancillary Service Market to allow participation of Load Resources that are not Controllable Load Resources. Supports PUCT market design directives.	\$600k	Initiated: October 2021 Planning Complete: Feb 2022 Target Go-Live: by June 2022
ERCOT Contingency Reserve Service (ECRS) Implementation	Implement a new Ancillary Service called ECRS with a 10-minute response time that is dispatched by SCED and will help improve the capacity and capability for ramping. Supports PUCT market design directives.	\$1.3m	Initiated: Jan 2022 Target Go-Live: by Summer 2023



Implement improvements in technological capabilities and financial processes

Project	Objective	Budget	Key Milestones
Securitization - SubChapter N	Implement system changes that support daily invoicing for the repayment of the financed \$2.1B uplift balance over 30 years, in support of HB4492 SubChapter N. Implementation primarily addresses settlement invoicing, credit management, and treasury management.	\$1.6M	Initiated: August 2021 Planning Complete: Nov 2021 Go-Live: March 2022
DC5 Infrastructure Refresh Program	Upgrade ERCOT's data center infrastructure approaching its end of useful lifespan. This includes servers, network equipment, and storage platforms as well as the supporting management software. The Program includes 6 sub-projects.	\$60M	Initiated: August 2020 Planning Complete: Jan 2023 Target Completion: Jan 2026

OKR Project Delivery



 Tentative
 Planned



Appendix

Project Delivery

- Typically:
 - Run ~45 active projects at a time
 - Initiate ~20-25 projects/year
 - Finish ~20-25 projects/year
 - Monthly internal project labor spend ranges from \$700k to over \$1M
 - ~40% of active projects have a budget \geq \$1M
- 2021:
 - Started 27 projects
 - Finished 21 projects
 - Supported 73 unique projects
- 2022:
 - 42 active projects (current snapshot)

Project Mapping to Revision Requests

Project	Revision Requests
Distribution Generation Resource / Distribution Energy Storage Resource (DGR/DESR) Implementation	<ul style="list-style-type: none"> • NPRR917, Nodal Pricing for SODGs and SOTGs • NPRR1016, Clarify Requirements for DGRs and DESRs • NPRR1052, Load Zone Pricing for Settlement Only Storage Prior to NPRR995 Implementation • NOGRR212, Related to NPRR1016 • PGRR082, Revise Section 5 and Establish Small Generation Interconnection Process (Non-RIOO portion only) • RRGRR026, Related to NPRR1016, Clarify Requirements for DGRs and DESRs (Out of Scope, Included in RIOO) • NPRR1065 – Implementation adjustment for NPRR917
Battery Energy Storage (BES) Combo Model Implementation	<ul style="list-style-type: none"> • NPRR963, Base Point Deviation Settlement & Deployment Performance Metrics for ESRs (Combo Model) • NPRR987, BESTF-3 ESR Contribution to Physical Responsive Capability and RT On-Line Reserve Capacity Calcs • NPRR1026, BESTF-7 Self-Limiting Facilities and Self-Limiting Resources • NOGRR208, Related to NPRR1002, BESTF-5 • OBDRR017, Related to NPRR987, BESTF-3 • PGRR081, Related to NPRR1026, BESTF-7 • VCMRR027 Related to NPRR986, BESTF-2 ESR Offer Curves, Pricing, Dispatch, and Mitigation
Fast Frequency Response (FFR) Advancement	<ul style="list-style-type: none"> • NPRR863, Creation of ECRS and Improved Implementation of Fast Frequency Response (FFR) • NOGRR187, Related to NPRR863, Creation of ERCOT Contingency Reserve Service and Revisions to Responsive Reserve • NPRR1015, Clarification of DAM implementation of NPRR863 Phase 2
Load Resource Participation in Non-Spinning Reserve (“NPRR1093”)	<ul style="list-style-type: none"> • NPRR1093, Load Resource Participation in Non-Spinning Reserve • NPRR1101, Create Non-Spin Deployment Groups made up of Generation Resources Providing Off-Line Non-Spinning Reserve and Load Resources that are Not Controllable Load Resources Providing Non-Spinning Reserve • NOGRR232, Related to NPRR1093, Load Resource Participation in Non-Spinning Reserve • OBDRR032, Non-Spin Changes Related to NPRR1093, Load Resource Participation in Non-Spinning Reserve • OBDRR033, ORDC Changes Related to NPRR1093, Load Resource Participation in Non-Spinning Reserve • OBDRR035 Related to NPRR1101, Create Non-Spin Deployment Groups made up of Generation Resources Providing Off-Line Non-Spinning Reserve and Load Resources that are Not Controllable Load Resources Providing Non-Spinning Reserve
ERCOT Contingency Reserve Service (ECRS) Implementation	<ul style="list-style-type: none"> • NPRR863, Creation of ECRS and Improved Implementation of Fast Frequency Response (FFR) • NOGRR187, Related to NPRR863, Creation of ERCOT Contingency Reserve Service and Revisions to Responsive Reserve • NPRR1015, Clarification of DAM implementation of NPRR863 Phase 2

Project Mapping to Revision Requests

Project	Revision Requests
Resource Integration & Ongoing Operations (RIOO)	<ul style="list-style-type: none"> • SCR781: MP Online Data Entry – Market Requirements • NPRR1002: BESTF-5, Energy Storage Resources (ESR) • NPRR1026: BESTF-7, Self-Limiting Resources • NPRR1029: BESTF-6, DC-coupled • NPRR1005: and RRGR025, Clarify Definition of Point of Interconnection and Add Definition for Point of Interconnection Bus (POIB) • NPRR1107: Addition of Weatherization Inspection Fees to the ERCOT Fee Schedule & Clarification of Generation Interconnection Request Fees • RRGR016: Additional Guidance for Solar Data • RRGR018: Replace Non-Modeled Generator with Settlement Only Generator • RRGR019: Add Switchable Generation Resource Designation • RRGR022: Related to NPRR973, Add Definitions for Generator Step Up and Main Power Transformer • RRGR023: Related to NPRR1002, BESTF-5 Energy Storage Resource Single Model Registration and Charging Restrictions in Emergency Conditions • RRGR029: Related to NPRR1077, Extension of Self-Limiting Facility Concept to Settlement Only Generators (SOGs) and Telemetry Requirements for SOGs • RRGR030: Allow New Voltage Levels in Resource Registration Information • RRGR031: Related to NPRR995m RTF-6 Create Definition & Terms for Settlement Only Energy Storage • PGRR040: Clarification of Water Supply Rights Attestation Obligation • PGRR047: FIS Department of Defense Declaration • PGRR066: Interconnection Request Cancellation & Creation of Inactive Status • PGRR076: Improvements to Generation Resource Interconnection or Change Request (GINR) Process • PGRR081: Related to NPRR1026, BESTF-7 Self-Limiting Facilities • PGRR082: Revise Section 5 & Establish Small Generation Interconnection Process • PGRR085: Dynamic Model Improvements • PGRR086: Related to RRGR027, Clarify Models Required to Proceed with an FIS • PGRR091: FIS Application Completion 60-Day Limit • PGRR092: Related to NPRR1077, Extension of Self-Limiting Facility Concept to Settlement Only Generators (SOGs) and Telemetry Requirements for SOGs • PGRR099: Revise GIM Process to Ensure Compliance with the Lone Star Infrastructure Protection Act
Securitization - SubChapter N	<ul style="list-style-type: none"> • NPRR1114, Securitization – PURA Subchapter N Uplift Charges