

Pathway to a Smarter Distribution System through Situational Awareness and Predictive Analytics

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About EnerNex, a CESI Company

- Founded in 2003, EnerNex is a leader in providing engineering, consulting, and research services to the electric power industry worldwide
- Joined the world-leading electric power testing, consulting and engineering company CESI in June 2018
- Our focus is the electric grid and helping clients solve complex challenges
- The EnerNex team is comprised of experienced power engineers, control systems professionals, program managers, and regulatory and business experts.

Advancing a cleaner, smarter energy system



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EnerNex Targeted Service Areas

EnerNex offers targeted services that span from detailed engineering analyses up to high-level guidance. Our goal is to provide our clients with "no regrets" solutions which harmonize and align tactical and strategic perspectives.

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	Electric Energy Systems Engineering & Analysis	Renewable & Distributed Energy Integration & Interconnection	Grid Technology Consulting	Grid Modernization	Electric Industry Evolution
REPRESENTATIVE TYPES OF WORK	 Bulk Power & Distribution System Studies Complex Power Flow Modeling & Simulation Power Quality & Harmonics Analysis 	 Renewable Power Plant & DER Modeling Resource Integration Modeling & Analysis Interconnection Studies & Evaluation 	 Grid Technology Evaluation Use Case Development Requirements Definition Standards Compliance Procurement Assistance Owner's Engineer 	 Grid Modernization Planning Enterprise Architecture Cybersecurity End-to-end Grid Technology Evaluation 	 Strategic Roadmapping Business Case Development Change Management Regulatory Support Position Papers
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Overview

Drivers for Grid Management System (GMS) Project

Situational Awareness

- Distribution System State Estimator (DSSE)
- Short-Term Forecasting Engine (STFE)

DSSE Performance Evaluation (DPE) Methodology and Application Results

Summary



Drivers for Grid Modernization

- California Policy Goals
 - Reduce greenhouse gas emission to reduce its contribution to climate change.
 - 60% of electricity from renewables by 2030
 - Carbon neutrality by 2045
- Resource Investments

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- 80 GW of new utility-scale clean generation
- 30 GW of utility-scale energy storage
- 40% and 50% of California homes with rooftop solar by 2030 and 2045, respectively
- Grid operation needs to evolve to manage renewable energy resources, storage, and variable loads.



Grid Management System (GMS) Project

- SCE initiated GMS project to provide
 - Improved safety and reliability of the grid
 - DER Management and orchestration enabling operational flexibility
 - Enhanced situational awareness of the distribution grid
- GMS key applications for reliability and optimization
 - Fault Location, Isolation and Service Restoration (FLISR)
 - Volt-Var Optimization (VVO)
 - Optimization Engine (OE)

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- Foundational GMS applications for situational awareness
 - Distribution System State Estimator (DSSE)
- Short-Term Forecasting Engine (STFE)
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Thank you!



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