

Initiative Title: 1. Integrating DERs to Advance Grid and Community Resiliency

INITIATIVE DESCRIPTION

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- Evaluates practical, scalable approaches for coordinating customer-owned and utility-integrated DERs to improve affordability, reliability, outage preparedness, demand flexibility, and access to clean energy
- Demonstrates how coordinated DER programs, DERMS-enabled orchestration, operator readiness, and advanced energy storage can help distributed resources deliver measurable grid and community resilience benefits
- Addresses technical and operational requirements for DERs to deliver scalable affordability, reliability, and grid and community resilience benefits

PROPOSED INITIATIVE BUDGET	\$6,000,000
% OF TOTAL BUDGET (excl. admin & overhead)	39.2%
# OF RESEARCH TOPIC AREAS	2

ALIGNMENT SUMMARY

STRATEGIC OBJECTIVE ALIGNMENT No. 9

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The EPIC Program will support technology development, innovative deployment models, and real-world testing and evaluation for the demonstration of the use of clean distributed energy resources to reduce the impact of outage events, through strategies that allow critical and/or essential loads and services to remain powered through such events and that reduce power restoration time for vulnerable populations

SO 9 Alignment: Demonstrates how customer-owned and utility-integrated DERs can be coordinated, managed, and operated to maintain critical loads, improve outage preparedness, and strengthen grid and community resilience

CPUC ALIGNMENT

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- The High DER and Reliability Procurements proceedings are establishing frameworks for DERs coordination, flexible grid services, and DERMS integration to optimize use of existing distribution capacity
- Provides data on customer participation, load shifting performance, and grid benefits to inform future planning and decisions
- Coordinated DER orchestration, DERMS integration, cross-vendor interoperability, advanced storage, and high-DER operator readiness are not yet mature for broad deployment. Real-world utility validation is needed to address customer, technical, operational, and market uncertainties before ratepayers can reliably benefit from these approaches

RTA #1: Connected Customer Resources & Preparing for Resilient Grid Operations

WHAT PROBLEM ARE WE SOLVING? Pages 35-37

Supports customers’ needs, reliability, and affordability. Addresses the lack of proven, scalable approaches for coordinating multiple customer DERs to maintain critical loads to avoid outages, along with gaps in DERMS-to-device integration and operator readiness. Closing these gaps will help reduce outage impacts and restoration times for vulnerable populations.

Integrating DERs to Advance Grid and Community Resilience	
START	Q4, Y2027
OUTPUTS	2030
MARKET READY	2030

ALIGNMENT SUMMARY

WHAT IS THE DISTINCT RESEARCH APPROACH?	HOW WILL YOU KNOW YOU ARE SUCCESSFUL?	HOW WILL YOU COORDINATE?
• Demonstrate coordinated, DERMS-connected control of multiple customer DERs to maintain critical loads during outages and support faster restoration; Develop/validate RGTS for operating DER-rich systems, managing outages, & accelerating restoration of critical loads and services. (p. 35 Gaps Addressed) • Addresses unproven multi-DER coordination and operator-readiness gaps through separate real-world orchestration pilots & realistic, DER-rich training simulations (p. 35-36 Leveraging Past RD&D)	• Validated approaches for scalable coordination of multiple customer-owned DERs under realistic grid conditions (p. 36 Expected Outcomes) • Evaluation results from outage & restoration scenarios reflecting DVC resilience needs (p. 37 Equity Outcomes) • Findings on DER performance, customer participation, operational limitations, & potential reliability benefits (p. 36 Expected Outcomes) • Scalable DER coordination & improved operator readiness; bill savings, DER enrollment rates, peak-demand reduction, automated-response reliability, simulated restoration-time reduction. (p. 36 Metrics and Impact Assessment)	• SDG&E may have opportunities to coordinate with IOU Admins through ongoing meetings allowing for identification of potential joint or complementary projects/use cases. • IEEE 2030.5 interoperability and zonal DER coordination research; Demand response, managed EV charging, VPP, & DERMS deployments; Digital twins, microgrid testbeds, & immersive operator-training technologies. (p. 35 Leveraging past RD&D)

RTA #2: Advanced Energy Storage Technologies

SO #9: Leveraging DERs for Grid & Community Resiliency

Integrating DERs to Advance Grid & Community Resiliency

WHAT PROBLEM ARE WE SOLVING?

Pages 38-40

Addresses lack of real-world performance, cost, and safety data needed to determine which emerging storage technologies are most suitable to maintain critical loads during outages. The research will inform deployment strategies that reduce outage impacts and support customer resilience needs, including Disadvantaged and Vulnerable Communities.

START	Q4, Y2027
OUTPUTS	2029
MARKET READY	2029

ALIGNMENT SUMMARY

WHAT IS THE DISTINCT RESEARCH APPROACH?	HOW WILL YOU KNOW YOU ARE SUCCESSFUL?	HOW WILL YOU COORDINATE?
• Demonstrate emerging storage & flexible grid technologies, including alternative battery chemistries, long-duration storage, second-life batteries, dynamic line rating, & advanced safety solutions, under real-world utility & customer use cases (p. 38 Gaps Addressed) • Analyze lifecycle economics, including capital, installation, O&M, and end-of-life costs, compared w/established technologies (p. 38 Gaps Addressed) • Moves beyond lab testing, assessing performance, safety, degradation, interoperability, & operational readiness under real-world conditions, including the ability to provide reliable service during disruptions (p. 38 Gaps Addressed)	• Identify technology-specific lifecycle costs, deployment requirements, supply-chain constraints, and operating conditions to support informed planning and scalable, resilient deployment (p. 39 Metrics and Impact Assessment) • Validated emerging storage technologies that improve grid and community resilience, percentage reduction in LCOS relative to lithium-ion, percentage of participating DVC members reporting outcomes that reflect community input. (p. 39 Metrics and Impact Assessment)	• Through ongoing coordination with other IOU administrators, SDG&E may identify opportunities for complementary demonstrations and share findings, avoiding duplication. • Builds on SDG&E’s EPIC 4 ITF Microgrid Testbed, a controlled environment for comparative BESS performance, interoperability, & utility-integration testing (p. 38 Leveraging Past RD&D) • Leverages knowledge gained through SCE’s EPIC 4 Accelerating Grid-Interactive, Flexible Data Centers in California, including its deployment & evaluation of sodium-ion storage