Clay Faber - Director
Regulatory Affairs
8330 Century Park Court, 32-F
San Diego, CA 92123

April 30, 2025

ADVICE LETTER 4649-E

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

SUBJECT: SUBMISSION OF SAN DIEGO GAS & ELECTRIC COMPANY'S 2024 ELECTRIC PROGRAM INVESTMENT CHARGE ADMINISTRATOR ANNUAL REPORT PURSUANT TO DECISION 23-04-042

PURPOSE

San Diego Gas & Electric Company (SDG&E) hereby submits for approval to the California Public Utilities Commission (Commission) this Tier 2 Advice Letter (AL) for its 2024 Electric Program Investment Charge (EPIC) Administrator Annual Report in accordance with Ordering Paragraph (OP) 8 of Decision (D.) 23-04-042 (Decision).

BACKGROUND

D.23-04-042 adopted the Staff Proposal, related to EPIC annual reporting, with modifications. The Commission agreed that annual reports should be streamlined, where possible, to support the evolving needs of the EPIC program, including leveraging the EPIC database so that the report narratives complement the database, not duplicate it.

The Decision requires the annual reports must be filed as Tier 2 Advice Letters and specifies that incomplete or inaccurate entries in the EPIC database will be grounds for rejecting the Advice Letter and require prompt refiling of the annual report within 30 days.

In Appendix C of the Decision, the Commission provided a revised annual report outline to be used moving forward. Annual reports will be used to inform EPIC program evaluations. Further, EPIC Administrators are required to provide a coordinated presentation to the Commission on an annual basis, at either a Commission business meeting or the Commission's Emerging Technology Committee, at the Commission's discretion. The presentation is to be made to the Commission in a timely manner after the submission of Administrators' annual reports. Administrators shall coordinate this presentation via Energy Division Staff, who will provide guidance on timing and agenda.

As part of reporting transparency, EPIC Administrators should likewise be transparent that ratepayers are the source of the billions of dollars in funding that supports the important work of the EPIC Program. To accomplish this, Administrators shall post clearly and prominently in their annual reports and on all program, project, and outreach materials, websites, and any other public materials (including those of third-party EPIC contractors) the following language consistent with other utility ratepayer funding programs: "This program is funded by California utility customers under the auspices of the California Public Utilities Commission."

DISCUSSION

SDG&E's 2024 EPIC Annual Report is presented in Attachment A of this Advice Letter. There are no comprehensive final reports to include with this annual report as the remaining EPIC-3 project, Project 7, Module 3, is ongoing.[1] Additionally, SDG&E's EPIC-4 Investment Plan (Application 22-10-002) was approved by the Commission in D.23-11-086 (EPIC-4 Decision). Since SDG&E's EPIC-4 Decision, SDG&E launched its EPIC-4 projects in late 2024. As such, SDG&E's 2024 EPIC Annual Report will mainly focus solely on EPIC-3 work and introduce EPIC-4 Projects.

D.23-04-042 also encouraged administrators to leverage EPIC project information within the EPIC Database, which is available at: https://database.epicpartnership.org/projects. SDG&E's 2024 EPIC Annual Report will be posted on SDG&E's EPIC website at: www.sdge.com/EPIC.

PROTEST

Anyone may protest this Advice Letter to the California Public Utilities Commission. The protest must state the grounds upon which it is based, including such items as financial and service impact, and should be submitted expeditiously. The protest must be submitted electronically and must be received no later than May 20, 2025, which is 20 days from the date this Advice Letter was submitted with the Commission. There is no restriction on who may submit a protest. The protest should be sent via e-mail to the attention of the Energy Division at EDTariffUnit@cpuc.ca.gov. A copy of the protest should also be sent via e-mail to the address shown below on the same date it is delivered to the Commission.

Attn: Greg Anderson
Regulatory Tariff Manager
E-mail: GAnderson@sdge.com
SDGETariffs@sdge.com

[1] D.12-05-037 at 8.

EFFECTIVE DATE

Pursuant to D.23-04-042, this submittal is subject to Energy Division disposition and should be classified as Tier 2 (effective after staff approval). SDG&E requests this Advice Letter be approved effective May 30, 2025, 30 days from its submittal.

NOTICE

A copy of this filing has been served on the utilities and interested parties shown on the attached list including interested parties in R.19-10-005, A.21-06-021, A.22-05-016, A.23-05-010, and Applicants, by either providing a copy electronically or by mailing them a copy hereof, properly stamped and addressed. Address changes should be directed to SDG&E Tariffs by e-mail at SDGETariffs@sdge.com.

/s/ Clay Faber
CLAY FABER
Director – Regulatory Affairs

California Public Utilities Commission

ADVICE LETTER SUMMARY

ENERGY UTILITY

MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)

Company name/CPUC Utility No.:

Utility type:

☐ ELC ☐ GAS ☐ WATER

☐ PLC ☐ HEAT

Contact Person:
Phone #:
E-mail:
E-mail Disposition Notice to:

EXPLANATION OF UTILITY TYPE

ELC = Electric GAS = Gas WATER = Water
PLC = Pipeline HEAT = Heat

(Date Submitted / Received Stamp by CPUC)

Advice Letter (AL) #:

Tier Designation:

Subject of AL:

Keywords (choose from CPUC listing):

AL Type: ☐ Monthly ☐ Quarterly ☐ Annual ☐ One-Time ☐ Other:

If AL submitted in compliance with a Commission order, indicate relevant Decision/Resolution #:

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL:

Summarize differences between the AL and the prior withdrawn or rejected AL:

Confidential treatment requested? ☐ Yes ☐ No

If yes, specification of confidential information:
Confidential information will be made available to appropriate parties who execute a nondisclosure agreement. Name and contact information to request nondisclosure agreement/ access to confidential information:

Resolution required? ☐ Yes ☐ No

Requested effective date:

No. of tariff sheets:

Estimated system annual revenue effect (%):

Estimated system average rate effect (%):

When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).

Tariff schedules affected:

Service affected and changes proposed[1]:

Pending advice letters that revise the same tariff sheets:

[1]Discuss in AL if more space is needed.

Protests and all other correspondence regarding this AL are due no later than 20 days after the date of this submittal, unless otherwise authorized by the Commission, and shall be sent to:

CPUC, Energy Division Attention: Tariff Unit 505 Van Ness Avenue San Francisco, CA 94102 Email: EDTariffUnit@cpuc.ca.gov	Name: Title: Utility Name: Address: City: State: Zip: Telephone (xxx) xxx-xxxx: Facsimile (xxx) xxx-xxxx: Email:
	Name: Title: Utility Name: Address: City: State: Zip: Telephone (xxx) xxx-xxxx: Facsimile (xxx) xxx-xxxx: Email:

General Order No. 96-B
ADVICE LETTER SUBMITTAL MAILING LIST

Public Utilities Commission
CA. Public Avocates (CalPA)
R. Pocta
F. Oh
P. Cunningham
C. Li
M. Halperin
Energy Division
M. Ghadessi
M. Salinas
L. Tan
R. Ciupagea
Tariff Unit
CA Energy Commission
B. Penning
B. Helft
Advantage Energy
C. Farrell
Alcantar & Kahl LLP
M. Cade
K. Harteloo
AT&T
Regulatory
Barkovich & Yap, Inc.
B. Barkovich
Biofuels Energy, LLC
K. Frisbie
Braun & Blaising, P.C.
S. Blaising
D. Griffiths
Buchalter
K. Cameron
M. Alcantar
CalCCA
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CA Dept. of General Services
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California Energy Markets
General
California Farm Bureau Federation
K. Mills
California Wind Energy
N. Rader
Cameron-Daniel, P.C.
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S. Anders
Energy Regulatory Solutions Consultants
L. Medina
Energy Strategies, Inc.
K. Campbell
EQ Research
General
Goodin, MacBride, Squeri, & Day LLP
B. Cragg
J. Squeri
Green Charge
K. Lucas
Hanna and Morton LLP
N. Pedersen
JBS Energy
J. Nahigian
Keyes & Fox, LLP
B. Elder
Manatt, Phelps & Phillips LLP
D. Huard

McKenna, Long & Aldridge LLP
J. Leslie
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Tariff Unit
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S. Mara
SCD Energy Solutions
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SD Community Power
L. Fernandez
L. Utouh

Shute, Mihaly & Weinberger LLP
O. Armi
Solar Turbines
C. Frank
SPURR
M. Rochman
Southern California Edison Co.
K. Gansecki
TerraVerde Renewable Partners LLC
F. Lee
TURN
M. Hawiger
UCAN
D. Kelly
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Service List
R.19-10-005
A.21-06-021
A.22-05-016
A.23-05-010

Attachment A

SDG&E® 2024 EPIC Annual Report

San Diego Gas & Electric Company

EPIC Administrator Annual Report

April 30, 2025

Table of Contents

1. Executive Summary

(Summarize how past year activities have made progress in addressing Strategic Objectives and Strategic Initiatives. Note any key successes or impediments/setbacks.)

The submission of the Annual Report (Report) for the 2024 calendar year is pursuant to Decision ("D.") 23-04-042 Ordering Paragraph ("OP") 8 and CPUC Energy Division Staff guidance[1] received via email. This Report provides an overview of SDG&E's EPIC activities during the 2024 calendar year.

SDG&E proposed and received approval for five projects that demonstrate system integration solutions in its first triennial application for the years 2012-2014 (EPIC-1).[2] In addition, SDG&E proposed and received approval for six projects that demonstrate grid modernization and technology integration solutions in its second triennial application for years 2015-2017 (EPIC-2).[3] SDG&E proposed and received approval for seven projects in multiple policy areas in its third triennial application for years 2018-2020 (EPIC-3).[4] SDG&E proposed and received approval for its 2021-2025 Investment Plan (EPIC-4).[5] This report provides an update on SDG&E's 2024 progress and year-end status for the ongoing project work under EPIC-3 Project 7, Module 3 and preliminary activities related to EPIC-4 projects that are in their early stages of development.

This program is funded by California utility customers under the auspices of the California Public Utilities Commission.

a. Overview of Programs/Plan Highlights

In Application (A.) 12-11-002, SDG&E requested Commission approval of five programs that demonstrate advanced distribution system integration solutions. In November 2013, SDG&E's Application and First Triennial EPIC Plan was approved in full, with minor modifications, by the Commission in D.13-11-025.[6]

In A.14-05-004, SDG&E requested Commission approval of its Second Triennial EPIC Plan which included five programs that have the potential to help modernize the utility power system to improve customer benefits, as well as a sixth project for SDG&E participation in industry research development & deployment (RD&D) consortia. In April 2015, SDG&E's Application and Second Triennial EPIC Plan was approved in full, with minor modifications, by the Commission in D.15-04-020.

In A.17-05-009, SDG&E requested Commission approval of its Third Triennial EPIC Application which included seven project areas addressing topics in grid modernization,

[1] February 26, 2025 CPUC Staff Guidance for EPIC Annual Reports
[2] SDG&E's Application (A.12-11-002) for EPIC-1, approved in D.13-11-025, issued November 19, 2013.
[3] SDG&E's Application (A.14-05-004) for EPIC-2, approved in D.15-04-020, issued April 15, 2015.
[4] SDG&E's Application (A.17-05-009) for EPIC-3, approved in D.18-10-052, issued November 2, 2018.
[5] SDG&E's Application (A.22-10-002) for EPIC-4, approved in D.23-11-086, issued December 4, 2023.

[6] D.13-11-025 at 63 and 136.

such as safety, advanced operation solutions, and resiliency.

D.18-10-052 approved the project areas that were included in the application but only released 2/3 of the funds, pending approval of a Research Administration Plan (RAP), which occurred in 2020. The RAP application, A.19-04-026, was a joint filing of IOU Administrators and was approved in D.20-02-003, releasing the remaining funds.[7] The EPIC-3 funds were applied to four project areas in A.19-04-026.

In A.22-10-002, SDG&E requested Commission approval of its application for the Fourth EPIC cycle. Beginning in EPIC-4, the cycles will change from a three-year basis to a five-year basis. The application consisted of two strategic objectives, each with a corresponding strategic initiative, and was filed in October of 2022. In November 2023, SDG&E's 2021-2025 EPIC Investment Plan (EPIC-4) was approved by the Commission in D.23-11-086.

b. Status of EPIC-1 and EPIC-2 Projects

All EPIC-1 and EPIC-2 projects were completed by the close of 2018, as reported in the 2019 Annual Report. All final reports for the EPIC-1 and EPIC-2 Cycles were provided with prior annual reports and are posted on the SDG&E EPIC public website.

c. Status of EPIC-3 Projects

All EPIC-3 projects, except Project 7, were completed by the close of 2021. The final project module of Project 7, Module 3 is still active. Current funding information for SDG&E's EPIC-3 Cycle is provided in Table 1.

[7] The IOUs' Joint Application (A.19-040-26), approved in D.20-02-003, issued February 10, 2020.

Table 1. SDG&E's EPIC-3 (2018-2023) Portfolio as of December 31, 2024

EPIC-3 Projects (2018--2024)				
EPIC-3 Projects	**Incurred[8] Costs ($ thousands)**	**Encumbered[9] Costs ($ thousands)**	**Commitments[10] ($ thousands)**	**Project Status**
3. Application of Advanced Metering Infrastructure (AMI) Data to Advanced Utility System Operations	1,527	1,527	1,527	Complete
4. Safety Training Simulators with Augmented Visualization	1,944	1,944	1,944	Complete
5. Unmanned Aircraft Systems (UAS) with Advanced Image Processing for Electric Utility Inspection and Operations	709	709	709	Complete
7. Demonstration of Multiple-Purpose Mobile Battery for Port of San Diego and Other Applications	4,060	4,672	4,672	In Progress
SDG&E Program Administration	913	916	916	In Progress
Total	**$9,153**	**$9,768**	**$9,768**	

[8] As used in this Report, incurred costs mean actual booked expenditures.
[9] As used in this Report, encumbered costs are funds that are specified for contracts (D.13-11-025 at 101; Ordering Paragraph 45) or for in-house work necessary in collaboration with a contractor (D.13-11-025 at 53). They differ from commitments in that commitments are the identification of blocks of funds to be assigned to projects, whereas encumbrances specify how the commitments will be used in the projects.
[10] As used in this Report, commitment means assigned for anticipated work on a project, including anticipated contractual commitments, equipment purchases, software licenses, associated technical work by the SDG&E project team, and other expenses directly associated with the project work.

d. Status Summary of EPIC-3 Project 7

- **EPIC-3 Project 7: Demonstration of Multi-Purpose Mobile Battery**

The following is a summary of EPIC-3 Project 7, Module 3, the last project of the cycle. Additional details of this project appear in the main body of the report.

The objective of SDG&E's EPIC-3 Project 7 is to perform a pre-commercial demonstration of mobile battery energy storage systems (MBESS) and examine the value proposition from using MBESS across multiple sites and use cases. An MBESS is a battery energy storage system on wheels that can provide multiple use cases based on a single MBESS application or a combination of several applications (stacking of applications) to provide grid support and reliability/resiliency solutions for utility projects at different sites. This project is divided into three work modules to align with different mobile batteries, use cases and application situations. Modules 1 and 2 were completed and documented in comprehensive final reports filed with the CPUC at the end of 2021 and posted on the EPIC public website.

Module 3 of Project 7 is designed to include trials of Institute of Electrical and Electronics Engineering (IEEE) 2030.5 to assess the extent to which it will improve the value proposition for use of MBESS and stationary DER. IEEE 2030.5, the default communication method established by the Smart Inverter Working Group facilitates standardized communication and interoperability between DERs and the grid. This demonstration served to highlight both the benefits and challenges associated with this communication profile, providing valuable insights into its practical deployment. As a primary test case, the project team leveraged 2030.5 as a means of controlling the MBESS to provide a demonstration of alleviating circuit Operational Flexibility (OpFlex) constraints under specific scenarios (e.g., planned abnormal distribution switch states). By showcasing MBESS deployment in real-world grid conditions, the project supports efforts to enhance grid reliability, optimize DER utilization, and deliver operational benefits to customers.

With funds remaining in EPIC-3, Project 7, Module 3 was allocated additional funding allowing for demonstrations of a second phase of use cases for the MBESS. Module 3 demonstrated these additional use cases and metrics for testing, application, and benefit realization of the MBESS. The extended demonstrations provided data-driven insights into the practical deployment of MBESS in various scenarios, reinforcing its role as a flexible grid resource.

Overall, the project assessed the effectiveness and benefits of deploying a mobile battery—or multiple units—to enhance grid performance and customer value. By rotating the MBESS across various applications, it identified optimal deployment strategies, operational efficiencies, and commercial use cases. While not a requirement, these findings align with EPIC-4's Strategic Objective, **Increase the Value Proposition of DERs for Customers on the Grid**.

2024 Activities/Status: Key project activities included finalizing 2030.5 use case final reports, coordinating vendor delivery of the companion trailer, constructing a controls cabinet for backup

power management, scheduling Tesla MBESS operations for grid support, and sending the PROMIS battery back for additional battery strings and firmware updates.

e. Status of EPIC-4

San Diego Gas & Electric (SDG&E) successfully initiated its Electric Program Investment Charge (EPIC) Cycle 4 projects in April 2024 through public workshops and were formally approved by SDG&E's EPIC-4 Steering Committee in October 2024. These new projects advance key strategic objectives outlined in SDG&E's EPIC-4 Investment Plan. These initiatives are designed to enhance grid reliability, resilience, affordability and sustainability through innovative technology demonstrations. Additionally, for the first time in SDG&E's EPIC program, SDG&E's EPIC-4 Steering Committee approved Disadvantaged Community summer intern positions.

As SDG&E launches its EPIC-4 projects, progress is in the early stages. The following provides a brief introduction and overview of the projects and activities that contribute to EPIC-4 strategic objectives and initiatives:

- **Phasor Measurement Units (PMUs) Based Power Network Analysis for Increased Situational Awareness** – Enhancing real-time situational awareness through advanced network monitoring and analysis.

This project will install PMUs in specific 69kV areas where inverter-based resources (IBRs), including batteries, are connected or will soon connect at both transmission and distribution levels. The data from the PMUs will not only help monitor the local area but will help ensure the local transmission area is contingency secure. As batteries can quickly charge or discharge, the creation of near real-time "base case" will not only provide for monitoring the dynamics (including those buses with no PMUs that becomes observable) but will also serve for conducting security analysis. This project will utilize an existing platform that combines existing PMU data with the new data from the selected area to build a more expanded base case. A software program will be developed to automate the observability analysis of the local area in order to minimize the number of PMU additions while maximizing observability. This will allow for expanded monitoring and better analysis of how the system performs under normal, contingency, and emergency conditions.

To support the strategic objective of **Creating a More Nimble Grid to Maintain Reliability as California Transitions to 100 Percent Clean Energy**, and strategic initiative, **Grid Modernization**, this project focuses on enabling faster monitoring and security analysis of power flows, especially with the increasing presence of inverter-based resources (IBRs) on local transmission and distribution systems. As more IBRs, such as batteries, are added and their output could change rapidly, there is a need for improved monitoring and analysis capabilities that this project can bring.

2024 Activities/Status: In the early development stages of the project, key efforts focused on the project team, evaluating capability of the vendor and initiating the procurement process. This included reviewing existing and amending contracts to secure the necessary expertise and tools for successful project execution.

- **Grid Resilience and Sustainability through Integrated Vehicle-to-Grid (V2G) and Renewable Energy at Community Resource Centers (CRCs)** – Strengthening grid resilience by integrating V2G technology and renewable energy resources to support CRC operations

This project will demonstrate the integration of electric vehicles (EVs) with Vehicle-to-Building (V2B) and V2G technologies, enabling energy discharge to both buildings and the grid. Working alongside planned solar installations and a Battery Energy Storage System (BESS), the demonstration includes two V2G-capable EV chargers at the CRC site and on-site V2G-enabled EVs. Predictive software will optimize battery use by coordinating with renewable energy sources and energy management systems, both locally and grid-wide.

The project showcases how EVs can serve as flexible, sustainable energy assets, supporting peak shaving during high-demand periods, providing backup power during Public Safety Power Shutoff (PSPS) events, and enhancing overall grid resilience. By dynamically managing energy flow between EVs, the solar array, BESS, and the grid, the initiative offers a scalable model for reducing energy costs, improving stability, and expanding renewable energy use, particularly in remote and disadvantaged communities. The project supports the **Grid Modernization Strategic Initiative** by positioning EVs as DERs within a broader resilience framework.

2024 Activities/Status: In the early development stages of the project, key efforts focused on assembling the project team, identifying and evaluating potential vendors and initiating the procurement process. This included negotiating and executing contracts to secure the necessary expertise and tools for a successful project execution.

- **Power Quality and Smoke Detection Integration** – Improving safety and reliability through disparate system integration to support grid reliability.

Power Quality (PQ), Electric Fault Data (EFD), and smoke detection will be integrated into a single platform to monitor, alarm, and quickly locate events on circuits. By using machine learning and real-time data, the system will provide actionable information to reduce response times and focus patrol efforts.

The integration of PQ, EFD, and smoke detection supports the **Grid Modernization Strategic Initiative** by improving public safety and reliability through advanced intelligence and accelerated detection.

2024 Activities/Status: In the early development stages of the project, key efforts focused on assembling the project team, identifying and evaluating potential vendors and initiating the procurement process. This included negotiating and executing contracts to secure the necessary expertise and tools for a successful project execution.

- **Zonal Electrification with Integrated Distributed Energy Resources (IDER) Operational Flexibility** – Implementing zonal electrification strategies to optimize distributed energy resources and enhance operational flexibility.

The purpose of this demonstration is to explore customer decision-making by integrating DER flexibility and promoting electrification, particularly for underserved customers. The project aims to capture and understand the decision-making process of customers, ensuring the benefits of electrification and DER flexibility are accessible to all, inclusive of DACs. The project will involve field testing and demonstration of the use of the 2030.5 protocol, ensuring interoperability and the ability to demonstrate grid flexibility use cases. As part of a broader effort, the project will establish production DERMS integration requirements. This includes ensuring the coexistence of DERMS with existing SDG&E technology components, which is crucial for optimizing the overall distribution system operator environment. By integrating these systems, SDG&E aims to enhance the efficiency and reliability of its distribution network, in support of its strategic objectives: **Increase the Value Proposition of DERs to Customers on the Grid** and Strategic Initiative: **DER Integration**.

2024 Activities/Status: In the early development stages of the project, key efforts focused on assembling the project team, identifying and evaluating potential zonal electrification selection tools for a successful project execution.

- **Renewable Mobile Nanogrid for Climate Resiliency** – Deploying a mobile, renewable-powered nanogrid to enhance climate resilience and provide sustainable backup power solutions.

A logical next step from the EPIC-3 demonstrations on MBESS is to examine mobile microgrid or nanogrid capabilities, in alignment with Strategic Initiative: **Create a More Nimble Grid to Maintain Reliability as California Transitions to 100 Percent Clean Energy**. This demonstration will evaluate the nanogrid as a backup power solution for Community Resource Centers (CRCs), enhancing reliability and resilience by operating independently or in coordination with stationary assets. Featuring a built-in solar canopy, hydrogen production and storage, battery integration, and atmospheric water generation, the system can also function as a mobile command center. Beyond emergency use, it serves as an educational platform to raise public awareness about renewable technologies, including hydrogen solid-state storage.

2024 Activities/Status: Through the EPIC program, SDG&E acquired a containerized, mobile nanogrid to support communities during emergency climate events such as wildfires and PSPS. This emission-free system offers an alternative to diesel generators, capable of powering electric vehicles, charging devices, and producing clean drinking water from air moisture. The unit is owned by a third party and leased to SDG&E, with an option to purchase after three years. In 2024, the unit underwent final testing for customer acceptance.

Current funding information for SDG&E's EPIC-4 Cycle is provided in Table 2.

Table 2. SDG&E's EPIC-4 (2021-2025) Portfolio as of December 24, 2024

EPIC-4	Incurred[11] Costs ($ thousands)	Encumbered[12] Costs ($ thousands)	Commitments[13] ($ thousands)	Funding Status
Strategic Initiative: Grid Modernization	15	7,285	7,285	In Progress
Strategic Initiative: DER Integration	0	7,285	7,285	In Progress
SDG&E Program Administration	343	1,628	1,628	In Progress
Total[14]	**$358**	**$16,198**	**$16,198**	

[11] As used in this Report, incurred costs mean actual booked expenditures.
[12] As used in this Report, encumbered costs are funds that are specified for contracts (D.13-11-025 at 101; Ordering Paragraph 45) or for in-house work necessary in collaboration with a contractor (D.13-11-025 at 53). They differ from commitments in that commitments are the identification of blocks of funds to be assigned to projects, whereas encumbrances specify how the commitments will be used in the projects.
[13] As used in this Report, commitment means assigned for anticipated work on a project, including anticipated contractual commitments, equipment purchases, software licenses, associated technical work by the SDG&E project team, and other expenses directly associated with the project work.
[14] Total pursuant to Appendix B of D.21-11-028 but could vary due to rounding.

2. Introduction and Overview

Background on EPIC (Very short general description of EPIC and the Program Administrator's role.)

The California Public Utilities Commission (CPUC) established the Electric Program Investment Charge (EPIC) to assist the development of non-commercialized new and emerging clean energy technologies in California while aiding commercially viable projects. EPIC consists of three program areas: (1) applied research and development; (2) technology demonstration and deployment; and (3) market facilitation, consisting of market research, regulatory permitting and streamlining, and workforce development activities. EPIC activities must be designed to produce electricity ratepayer benefits for San Diego Gas & Electric (SDG&E), Pacific Gas and Electric (PG&E), and Southern California Edison (SCE) customers.

The annual EPIC funding is collected from customers in electric utility bills at the following levels: PG&E (50.1%), SCE (41.1%), and SDG&E (8.8%). The California Energy Commission (CEC) administers 80% of the funding with authorization to invest in all three program areas. SDG&E, PG&E and SCE administer 20% of the funding with funding shares proportional to their respective collections and are limited to investing only in pre-commercial technology demonstrations. Therefore, SDG&E's share of the EPIC funding is 0.2 x 0.088 = 1.76%.

a. EPIC Program Components (Detail how past year activities have made progress in addressing Strategic Objectives and Strategic Initiatives.)

SDG&E successfully launched its EPIC-4 cycle projects in October 2024 and hosted multiple public workshops and meetings throughout the year. For the first time in the program's history, the EPIC-4 Steering Committee approved summer intern positions from Disadvantaged Communities. Additionally, SDG&E participated in various conferences and workshops to support industry engagement and knowledge sharing.

In response to this requirement[15], SDG&E's 2024 EPIC Annual Report includes all relevant and available information. However, as EPIC-4 projects are still in preliminary stages, more detailed insights will be provided in the next reporting cycle. Activities throughout 2024 primarily involved an EPIC-3 project, which was approved at the project level rather than under EPIC-4's framework of Strategic Objectives, Strategic Initiatives or specific funding requirements surrounding the Decision. D.23-04-042 also encouraged administrators to leverage EPIC project information within the EPIC Database, which is available at: https://database.epicpartnership.org/projects. SDG&E's 2024 EPIC Annual Report will be posted on SDG&E's EPIC website at: www.sdge.com/EPIC.

[15] D.23-04-042, OP 8

c. Coordination

(Detail coordination and compliance with EPIC proceedings. Provide data on coordination with the market and other Research & Development (R&D) actors, coordination among administrators in moving innovation from applied R&D to Technology Demonstration and Deployment (TD&D) and in facilitating innovation uptake; with Disadvantaged Vulnerable Communities (DVCs), Community Based Organizations (CBOs), and the Disadvantaged Communities Advisory Group (DACAG) regarding the Environmental Social Justice (ESJ) Action Plan and Justice40; and with CPUC on its Distributed Energy Resources (DER) Action Plan. Explain with data how engagement in public process, workshops, CPUC proceedings, policies, legislation, and other direction is incorporated into administrator processes to keep making refinements in the efficacy of coordination and engagement.)

SDG&E is tracking several CPUC proceedings that align with EPIC priorities, including microgrids, vehicle electrification, DER integration, climate adaptation, and long-term gas system planning and provides feedback on how EPIC can provide value. The following proceedings are being tracked by the EPIC Program Manager:

- Microgrid Order Instituting Rulemaking (OIR) (Rulemaking (R.) 19-09-009)
- Development of Rates and Infrastructure for Vehicle Electrification OIR (R.18-12-006)
- Higher DER OIR (R.21-06-017)
- Climate Change Adaption (R.18-04-019)
- Establish Policies, Processes, and Rules to Ensure Safe and Reliable Gas Systems in California and Perform Long-Term Gas System Planning OIR (R.24-09-012)

The four EPIC administrators regularly coordinate through meetings to align on program activities.

While equity-focused coordination (e.g., with DACAG, CBOs, and under the ESJ Action Plan) was not part of EPIC-3 requirements, equity focused coordination is incorporated into EPIC-4. EPIC-4 projects will meet requirements to demonstrate **25% in Disadvantaged Communities (DACs)** and **10% in low-income communities**, with increased outreach as projects develop.

Details and dates of stakeholder events held throughout 2024 are provided in Table 3 below.

Table 3. EPIC Events

Stakeholder Event Name	Date	Details
EPIC-5 Workshops	April 10-12, April 30, May 1, 2024	Sent SMEs for each workshop
EPIC-4 Public Workshop	April 24, 2024	Presentations of EPIC-4 Projects, 34 people in attendance
CEC CAISO EPIC Transmission Debriefing	May 2, 2024	SDG&E shared their newest EPIC-4 transmission project

Stakeholder Event Name	Date	Details
DACAG Meeting	July 19, 2024	Invited DACAG to Joint IOU Annual EPIC Workshop
CBO Mid-Year Webinar	July 28, 2024	60 people in attendance
Joint IOU Annual EPIC Workshop	August 5, 2024	Hybrid Event, hosted by SDG&E, 50 people attended virtually, 34 in person
CEC EPIC Symposium	Oct 28, 2024	SDG&E's President and CFO Bruce Folkman was a key panelist, Director of Clean, Alex Moffat, Transportation was a panelist
PG&E Innovation Summit	Nov 11, 2024	SDG&E sent their EPIC Program Manager and Artificial Intelligence Drone Project Team Members
eTruc DAC Workforce Development Working Group	July 2, 2024 October 8, 2024	SDG&E participates in Working Group meetings

c. Transparent and Public Process/CEC Solicitation Activities (Detail stakeholder engagement activities and any impediments encountered.)

When applicable, SDG&E is committed to conducting competitive procurements for those parts of the project work that require contracted services or major purchases of equipment or software. In some cases, sole sourcing for equipment or services is necessary due to the projects' specialized requirements. No solicitation activities occurred in 2024.

d. Regulatory Barriers

SDG&E continues to face significant regulatory challenges in the implementation and sharing of innovations derived from EPIC projects. The three primary regulatory barriers are CPUC General Order (GO) 173, CPUC Section 851 and CPUC GO 165.

CPUC GO 173 imposes stringent requirements on transactions involving utility property valued at $5 million or less. This order mandates a formal application process for approval, which can be time-consuming and cumbersome. Additionally, GO 173 does not distinguish between real property (such as land or facilities) and technologies or intellectual property (IP). This lack of differentiation is particularly problematic for the EPIC program, which is inherently innovative and often involves the development and transfer of advanced technologies and IP.

Similarly, **CPUC Section 851** requires utilities to secure authorization from the Commission before selling, leasing, or otherwise disposing of utility property necessary for public service. Again, real property and technologies are not differentiated. These regulations, while ensuring oversight, often delay the deployment and scaling of innovative solutions.

For example, SDG&E is currently encountering difficulties in sharing their latest Artificial Intelligence software models developed through an EPIC project (Drone Inspection Program)[16] with other utilities. Other utilities (e.g. PG&E, SCE and international utilities) are very interested in this project, but there is a regulatory barrier preventing to sell the model. The current regulatory framework does not facilitate easy collaboration and sharing of these advanced technologies, which could otherwise enhance operational efficiencies and reliability across multiple utilities.

CPUC GO 165 presents another impediment to the efficient implementation of EPIC projects. This order mandates time-based inspection cycles for electric distribution facilities, regardless of actual maintenance needs. The rigid schedule can lead to unnecessary inspections and maintenance activities, diverting resources from more critical tasks. Instead, a flexible, as-needed approach would be more effective. EPIC models can provide a risk-informed strategy, allowing for maintenance based on actual needs rather than predetermined timelines. This approach would be more efficient for workers and ultimately provide better ratepayer benefits by ensuring resources are allocated where they are most needed.

To maximize the benefits of EPIC projects for ratepayers, there is a pressing need for greater flexibility within the regulatory framework. Allowing more streamlined processes and fostering inter-utility collaboration will enable the rapid deployment of innovative solutions, ultimately providing enhanced safety, reliability, and affordability for California's electric system.

[16] https://www.sdge.com/wildfire-safety/aviation-services

3. Budget

a. Authorized Budget (Table Format, including breakout by Strategic Initiative and Program Administration.)

Table 4 below, sets forth SDG&E's Commission-authorized EPIC budget incurred costs for EPIC-3 and EPIC-4 as of December 31, 2024.

Table 4. SDG&E Budget and Incurred Costs for EPIC-3 and EPIC-4 (in $ thousands)

	EPIC 3 (2024)		EPIC 4 (2024)	
	Technology Demonstration & Deployment	**Program Administrative**	**Technology Demonstration & Deployment**	**Program Administrative**
SDG&E Commission-Authorized Budget[17]	8,852	916	14,571	1,628
SDG&E Incurred Costs[18] as of December 31, 2024	8,240	913	15	343

Table 5 below, sets forth SDG&E's Commission-authorized EPIC budget incurred costs for EPIC-3 and by strategic objective, strategic initiative and research topic for EPIC-4, as of December 31, 2024.

Table 5. SDG&E's EPIC-4 (2021 – 2025) and EPIC-3 (2018 – 2023) Budget as of December 31, 2024

Strategic Objective	**Strategic Initiative**	**Funding ($M)**	**Research Topic**	**Projects**	**Budget ($M)**
Create a More Nimble Grid	Grid Modernization	$7.3	Communication & Control Infrastructure for Power System Technology Advancement	PMU Project	$2.5
				PQ & Smoke Detection Integration	$2.74
				V2G Project	$1.3

[17] D.18-10-052 for EPIC-3 and D.21-11-028 Appendix B for EPIC-4
[18] Incurred costs mean actual booked expenditures.

Strategic Objective	Strategic Initiative	Funding ($M)	Research Topic	Projects	Budget ($M)
			Mobile Microgrid	Renewable Mobile NanoGrid	$0.84
				Sub Total	**$7.38**[19]
Increase the Value Proposition of DERs to Customers on the Grid	DER Integration	$7.3	Integrated DER Operational Flexibility	Zonal Electrification w/ Integrated DER	$4.3
				Sub Total:	**$4.3**
				EPIC-4 Total:	**$11.68**

NA	NA	$4.67	NA	EPIC-3 Project 7 Mobile Battery	**$4.67**
				EPIC-3 Total:	**$4.67**

[19] D.21-11-028, OP 10 allows for a transfer of 15% between Strategic Initiatives (S.I). SDG&E transferred 15% S.I. #2 into S.I. #1

Table 6 below, sets forth SDG&E's disbursements to the California Energy Commission (CEC) and California Public Utilities Commission (CPUC) for EPIC-1, EPIC-2, EPIC-3, and EPIC-4 as of December 31, 2024.

Table 6. SDG&E's Disbursements to the CEC and CPUC for EPIC-1, EPIC-2, EPIC-3 and EPIC-4

as of December 31, 2024 (in $ thousands)

	EPIC Triennial 1 (2012 – 2014)		EPIC Triennial 2 (2015 – 2017)		EPIC Triennial 3 (2018-2020)		EPIC Quinquennial 4 (2021-2025)	
	RD&D	**Program Administrative**	**RD&D**	**Program Administrative**	**RD&D**	**Program Administrative**	**RD&D**	**Program Administrative**
SDG&E Disbursements to CEC	16,127	3,024	40,624	2,991	53,986	4,301	17,105	2,605
SDG&E Disbursements to Commission for Regulatory Oversight	N/A	273	N/A	224	N/A	384	N/A	162

b. Commitments/encumbrances (including amount of funding encumbered in the past year and unencumbered funds remaining in the funding cycle.)

Table 7. SDG&E's EPIC-4 (2021-2025) Portfolio as of December 31, 2024

EPIC-4 Projects (2023 – 2025)				
EPIC-4 Projects	**Incurred[20] Costs**	**Encumbered[21] Costs**	**Commitments[22]**	**Project Status**
PMU	$0	$2,500,000	$2,500,000	In progress
PQ and Smoke Detection Integration	$6,995	$2,740,000	$2,740,000	In progress
V2G at CRCs	$0	$1,300,000	$1,300,000	In progress
Mobile Nanogrid	$8,256	$840,000	$840,000	In progress
Zonal Electrification w/Integrated DER	$0	$4,300,000	$4,300,000	In progress
SDG&E Program Administration	$208,675	$1,628,000	$1,628,000	In Progress

c. Fund shifting above 15% between Strategic Initiatives (discuss pending fund shifting requests and /or approvals.)

Not applicable

d. Uncommitted/unencumbered funds (discuss plans to allocate funds and any impediments to doing so.)

SDG&E is currently reviewing other internal proposed projects for the remaining uncommitted funds.

[20] As used in this Report, incurred costs mean actual booked expenditures.
[21] As used in this Report, encumbered costs are funds that are specified for contracts (D.13-11-025 at 101; Ordering Paragraph 45) or for in-house work necessary in collaboration with a contractor (D.13-11-025 at 53). They differ from commitments in that commitments are the identification of blocks of funds to be assigned to projects, whereas encumbrances specify how the commitments will be used in the projects.
[22] As used in this Report, commitment means assigned for anticipated work on a project, including anticipated contractual commitments, equipment purchases, software licenses, associated technical work by the SDG&E project team, and other expenses directly associated with the project work.

4. SDG&E EPIC-3 and EPIC-4 Projects

b. **High Level Summary (**Table of number of projects funded and total funding, by Strategic Initiative, Topic Area, investment period, and project status (open, completed, and suspended in the past year). Narrative detail of any key successes or impediments/setbacks in the past year. Describe any current joint CEC/IOU projects, or plans to develop

Table 8. Project Highlights as of December 31, 2024

Strategic Initiative	Funding ($M)	Topic Area	Projects	Budget ($M)	Status	Successes/Impediments
Grid Modernization	$7.3[23]	Communication & Control Infrastructure for Power System Tech. & Advancement	PMU Project	$2.5	In Progress	This project is still in the early stages of implementation, and therefore too early to identify key successes or potential impediments.
			PQ and Smoke Detection Integration	$2.74	In Progress	This project is still in the early stages of implementation, and therefore too early to identify key successes or potential impediments.
			V2G Project	$1.3	In Progress	This project is still in the early stages of implementation, and therefore too early to identify key successes or potential impediments.
		Mobile Microgrid	Renewable Mobile Nanogrid	$0.84	In Progress	This project is still in the early stages of implementation; however, a key preliminary success was the acquisition of the unit. The team evaluated nanogrid solutions based on their ability to support fully off-grid operation with key criteria including an innovative element, the inclusion of solid-state

[23] D.21-11-028, OP 10 allows for a transfer of 15% between Strategic Initiatives (S.I). SDG&E transferred 15% S.I. #2 into S.I. #1

Strategic Initiative	Funding ($M)	Topic Area	Projects	Budget ($M)	Status	Successes/Impediments
						hydrogen storage. This element was selected for its safety, modularity, and potential for long-duration energy storage. This approach ensured the selected nanogrid met both current operational and future-facing innovation goals.
DER Integration	$7.3	Integrated DER Operational Flexibility	Zonal Electrification w/Integrated DER	$4.3	In Progress	This project is still in the early stages of implementation, and therefore too early to identify key successes or potential impediments.
N/A	$4.67	N/A	EPIC-3 Project 7 Mobile Battery	$4.67	In Progress	The project successfully demonstrated that the IEEE 2030.5 communication standard can work effectively with the MBESS. Using the standard, the MBESS was able to handle several important tasks including: • Adjusting to changes in the power grid • Increasing how much electricity it can store and supply • Helping stabilize voltage by injecting or absorbing reactive power • Lowering voltage in a controlled way when needed A major focus of this module was to test two-way communication between the MBESS and the other systems using IEEE 2030.5 standard. Exploring communication loss between the server and the gateway and between the gateway and the MBESS, the system was still able to carry out its key functions, proving it can handle real-world problems reliably. A possible next step is to add a DERMS which could help control the system even more efficiently from a broader network perspective.

Strategic Initiative	Funding ($M)	Topic Area	Projects	Budget ($M)	Status	Successes/Impediments
						Building on the successes of the pre-commercial demonstrations of this project, a request for an MBESS fleet was included in SDG&E's 2024 General Rate Case filing (A.22-05-016) to reduce GHG emissions while offering power continuity to customers and support during construction activities.

b. **Project Status Report** (Summary narrative including success stories, impediments/setbacks, and lessons learned in the past year, including lessons learned from fund shifting. Anticipated RFPs from the coming year.)

The following are project summaries of SDG&E's 2024 progress and year-end status for the ongoing project work done in EPIC-3 Project 7, Module 3 and preliminary descriptions and expected benefits related to EPIC-4 projects that are in their early stages of development.

1. EPIC-3 Project, Module 3 - Demonstration of Multi-Purpose Mobile Battery

Objective:
SDG&E's EPIC 3 Project 7 initially aimed to demonstrate MBESS as an emerging technology to evaluate its benefits and value across SDG&E territory for various use cases. Module 3 of Project 7 later focused on enhancing MBESS' value by enabling remote monitoring and control via the IEEE 2030.5 communication protocol. The project demonstrated how IEEE 2030.5 enhances operational flexibility by integrating MBESS with a master platform, showcasing its potential for improving DER asset management and grid support.

The following Module 3 activities occurred in 2024:

- Completed final reports for the 2030.5 use cases
- Coordination with the vendor to finalize the companion trailer and acceptance of the delivery
- Constructed a controls cabinet to manage the Tesla MBESS and generators for extended backup power
- Tesla MBESS is actively charging and discharging on a schedule to optimize grid support
- The PROMIS Battery was sent back to manufacturer for the installation of additional battery strings and firmware updates

Benefits:
Module 2 highlighted MBESS's mobility benefits, including improved safety, reliability, power quality, lower emissions, cost savings, economic growth, and rapid deployment in disadvantaged communities. In Module 3, IEEE 2030.5-enabled MBESS demonstrated enhanced scalability, visibility, and operational flexibility by enabling bi-directional communication for improved monitoring, control, and future technology integration.

A quantitative outcome of the Module 3 demonstration is included below:

Benefit Area	Description	Outcome
Economic Benefits	Reduce O&M Costs	MBESS can be used to defer distribution upgrades associated with the rated power it provides. For example, an MBESS of 500

Benefit Area	Description	Outcome
		kW can defer investments needed on a circuit requiring up to 500 kW additional capacity (including cable and switchgear replacement, transformer replacement, etc.)

SDG&E's EPIC-3 Project 7 demonstrations have progressively advanced the use case for mobile battery energy storage systems. Building on the successes of the EPIC-3 pre-commercial demonstrations, SDG&E requested for an MBESS fleet in its 2024 General Rate Case filing (A.22-05-016) to reduce GHG emissions while offering power continuity to customers and supporting construction activities. Outcomes documented from the MBESS demonstrations were provided for cost justification of the commission-approved request and include:

- Supports SDG&E's decarbonization goals by reducing reliance on backup diesel generators
- Uses clean energy batteries that are not limited by physical location
- Enhances grid resiliency and operational flexibility for customers
- Deploys MBESS during public safety power shut-offs to support at-risk electric systems
- Provides backup power during system maintenance outages and adverse weather conditions
- Replaces diesel generators for planned maintenance and construction activities, ensuring power continuity while reducing environmental impact

Lessons Learned:
Fund shifting allowed for more use cases to be done (companion trailer). Because EPIC-3 Project 7 – fund shifting occurred, SDG&E was able to do more work on the mobile batteries. SDG&E built a customized mobile trailer to be used during PSPS/Power Outage events. Lessons learned are still to be determined.

2. Phasor Measurement Units (PMU) Based Power Network Analysis for Increased Situational Awareness

Objective:
The objective of this project is to expand the observability of SDG&E's local transmission network in new areas. This would improve real-time monitoring and situational awareness. To achieve this, the project will develop a program to automate the PMU (Phasor Measurement Unit) placement study. The direct ratepayer benefits would help defer costs by minimizing the number of PMU installations while maximizing observability of a local transmission area or operating district.

The program will be integrated with SDG&E's existing state estimator platform (state estimator is a software program that describes the current state of an electrical transmission system), to

conduct detailed PMU placement studies in two to three local areas or operating districts with a high concentration of inverter-based resources. These studies will identify optimal substation locations for PMU deployment to strengthen visibility and operational reliability. The outcomes of the placement study will serve as a roadmap for efficient PMU deployment across the broader SDG&E transmission system.

Benefits:
Enhanced reliability, observability and resilience are all benefits of PMU-based real-time network analysis, ultimately leading to improved service for ratepayers. Saved costs of deferred installations.

Enhanced Reliability

- Faster analysis
- High resolution state estimation
    - Fast enough to track system dynamics
- Allows for filtering of data issues

Expanded Observability

- Expands beyond existing PMU coverage for analysis such as oscillation source identification

Enhanced Resilience

- Back up to conventional state estimator in existing EMS when not solving

3. *Grid Resilience and Sustainability Through Integrated Vehicle-to-Everything (V2X) and Renewable Energy at Community Resource Centers (CRCs)*

Objective:
The EPIC 4 Community Resource Center Vehicle-to-Everything (V2X) demonstration project aims to enhance grid resilience and sustainability through the integration of V2X technology and renewable energy at Community Resource Centers (CRCs). This project will demonstrate the use of Battery Electric Vehicles (BEVs) as a resilience tool with V2X and Vehicle-to-Building (V2B) technologies, alongside existing solar installations and a Battery Energy Storage System (BESS).

Benefits:

Ratepayers:

- Lower Energy Costs: Potential savings through optimized energy usage and incentives
- Enhanced Resilience: Backup power during outages and improved grid stability
- Environmental Benefits: Reduced carbon footprint through increased use of renewable energy

- Modern Technology: Access to advanced V2X technology, infrastructure, and charging alongside an evacuation route and integrated into a community resource center that serves the community during PSPS events and as a community support hub

Grid Benefit and On-Site Energy Management:

- Improved Grid Reliability: Potential for enhanced response to grid conditions and overall reliability
- Interoperability: Easier integration of V2X systems with existing infrastructure
- Cost Savings: Potential for reduced operational costs through efficient energy management

State Initiatives:

- Support for Renewable Energy: Better management of renewable energy sources, including on-site solar and BESS
- Regulatory Compliance: Demonstration of interconnecting novel technology (V2X EV integration) in a new context (community resiliency and layered with on-site solar and BESS) in line with state energy goals and ambitions

4. Power Quality (PQ) and Smoke Detection Integration

Objective:
The objective of this project is to integrate Power Quality (PQ), Electric Fault Data (EFD), and smoke detection to quickly provide actionable information, enhance situational awareness, and support grid reliability. Disparate data sources will be integrated into a platform to monitor, alarm, and locate events on circuits, including in High Fire Threat Districts (HFTD). This integration aims to improve reliability by accelerating response times, decreasing outage times, and advancing partial restoration during an outage.

Benefits:
Integrating PQ, EFD, and smoke detection into a central monitoring system will enhance real-time monitoring, response, and prevention. Additional utility, community, and customer benefits include:

- Advances technology management, expanding SDG&E's communication intelligence
- Informs location and precursor to assist with real-time findings
- Reduces undetermined causes of faults and applies appropriate mitigations
- Reduces troubleshooting costs and outage times, with potential advanced restoration

5. *Zonal Electrification with Integrated Distributed Energy Resources (IDER) for Operational Flexibility*

Objective:
The project aims to capture and understand the decision-making processes of customers, ensuring that the benefits of electrification and DER flexibility are accessible to all, including those in DACs. As part of a broader roadmap, this project will establish production Distributed Energy Resource Management System (DERMS) integration requirements. This includes ensuring the coexistence of DERMS with existing SDG&E technology components, which is crucial for optimizing the overall distribution system operator environment.

Benefits:
By integrating these systems, SDG&E aims to enhance the efficiency and reliability of its distribution network, ultimately leading to better service for its customers, resulting in the following expected benefits.

SDG&E Customer Programs:

- **Lower Rate**: By transitioning to electric systems, customers may benefit from more stable and potentially lower energy costs over time, avoiding the high costs associated with maintaining and upgrading gas infrastructure.
- **Enhanced Safety**: Electric systems eliminate the risks associated with gas leaks and explosions, providing a safer environment for customers and their families.
- **Improved Air Quality**: Electrification reduces the reliance on fossil fuels, leading to cleaner air and a healthier living environment, especially important for those with respiratory conditions.
- **Modern and Efficient Appliances**: Customers can enjoy the benefits of modern electric appliances, which are often more efficient and easier to maintain than their gas counterparts.
- **Support for Clean Energy**: By opting for electric systems, customers contribute to the broader goal of reducing greenhouse gas emissions and supporting renewable energy sources, aligning with environmental values.
- **Increased Property Value**: Homes with modern, efficient electric systems may see an increase in property value, making it a smart investment for the future.

SDG&E Electric Distribution Operations:

- **Enhanced Grid Reliability:** The 2030.5 protocol supports real-time communication between distributed energy resources (DERs) and the Electric Distribution Operations control center with the potential to improve response to grid conditions and overall reliability.

- **Interoperability:** The IEEE 2030.5 protocol promotes easier interoperability between various DER systems and utility infrastructure, facilitating smoother integration and operation. Field demonstration of this claim ensures that a future DERMS can effectively communicate with various distributed energy resources (DERs) using the IEEE 2030.5 protocol.
- **Affordability:** Field demonstration of 2030.5 communications can identify potential issues early, reducing long-term operational costs and improving the overall efficiency of DER integration and operation.

6. Renewable Mobile Nanogrid for Climate Resiliency

Objective:
This project will conduct a pre-commercial demonstration of a nanogrid: a compact, mobile, and self-sustaining clean-energy system designed for emergency applications. The demonstration will evaluate its feasibility as a backup power solution for CRCs during emergency events.

The nanogrid features a built-in solar canopy, hydrogen production and storage, and battery integration, enabling it to operate independently or in coordination with stationary resources. It can function as a mobile command center, improving system reliability and resilience, and includes an innovative system that captures water from atmospheric moisture. Beyond emergency use, the nanogrid also serves as an educational platform to raise public awareness of renewable energy technologies, including hydrogen solid-state storage as an emerging technology solution.

Benefits:
This project will demonstrate zero-emission resilience strategies, leveraging solar power, batteries and clean hydrogen to provide mobile, reliable and renewable energy. It will deliver 100% zero-emission power for emergency command centers or community resource centers in disadvantaged communities, high fire threat areas, and remote communities. Practical uses of the nanogrid include EV charging, drinking water, Internet and workspace access and power. The following are value propositions identified for the project demonstration:

- Zero-emission resilience strategies
- Air quality benefits in comparison to alternatives (i.e. diesel backup generators)
- Reduced GHG emissions
- Reduced fossil fuel use and O&M costs

5. Conclusion

a. Key results for the year for SDG&E EPIC program.
SDG&E met a key milestone with the delivery of the Project 7 trailer under EPIC-3. The trailer will be used to conduct additional use case demonstrations. At the same time, the company moved forward with the launch of the projects under EPIC-4.

b. Next Steps for EPIC Investment Plan (Innovation transfer, stakeholder workshops, etc.)

As part of ongoing efforts to promote knowledge and innovation transfer, the MBESS Project Lead will attend an upcoming industry conference to present on the MBESS project. Meanwhile, SDG&E will continue to evaluate new project opportunities under EPIC-4 and, if needed, will conduct public workshops to solicit input from stakeholders. Looking ahead, if SDG&E is authorized to serve as an EPIC-5 Administrator, the company will organize all necessary stakeholder workshops to support the development of the EPIC-5 Investment Plan. SDG&E eagerly anticipates supporting EPIC's newest DAC interns during the summer of 2025.

c. Issues that may have major impact on progress in projects, if any.

Tariffs impacting clean technologies, along with rising costs and increased volatility of the supply chain has already presented challenges on project development. Additionally, uncertainty surrounding the availability and timing of Federal funding such as from the Inflation Reduction Act (IRA) and the Infrastructure Investment and Jobs Act (IIJA), may create further obstacles for identifying and securing co-funding opportunities for EPIC projects.

Appendix A - CPUC Staff Guidance for EPIC Annual Report

ED Staff Guidance to EPIC Administrators on EPIC Annual Report Content
February 26, 2025

In response to Electric Program Investment Charge (EPIC) administrator requests for guidance on EPIC 2024 annual report content, CPUC Energy Division (ED) Staff provides the following guidance based on Commission EPIC decisions.

EPIC administrator annual reports should provide broad context and outcomes which demonstrate to the Commission and stakeholders the purpose, value, and impact of ratepayers' EPIC program investments.

The EPIC annual reports should serve as the narrative roadmap to complement complete EPIC database entries and tell a plain language story on outcomes at the initiative and project levels. The narrative should demonstrate alignment with the administrator's approved investment plans for efficiency of comparison and include
fundamental problems to be solved, what the earlier efforts were and how they have led to current efforts, and how these efforts are anticipated to evolve through additional RD&D, such as scaling, deployment, and commercialization to create measurable impacts in terms of ratepayer benefit.

Administrators should tell a holistic story of EPIC investments over the life of the research describing the problem being addressed, proposed initiative to address, alignment with CPUC proceedings, coordination with other administrators, specific project efforts, and illustrate clear outcomes that demonstrate progress in achieving the State's climate
goals.

The guidance below builds off established CPUC requirements for annual reports and highlights key points that should be addressed.[1]

Holistic Approach to Annual Reporting

- Annual reports are necessary for ongoing transparency and compliance, as well as understanding program effectiveness, and provide a basis for assessing the need for program modifications.[2]
- The annual report narratives should complement the database, not duplicate it.[3]
- Narratives should include program overviews, coordination efforts, transparency mechanisms, fund shifting, key results, and next steps.[4]
- Annual reports should summarize how past year activities have made progress in addressing investment plan Strategic Objectives and Strategic Initiatives.[5] In doing so, administrators should align summaries with relevant investment plans as well as with previous reports to create continuity from year to year in demonstrating progress.
- Describe project outcomes including how results will be scaled and they be deployed, what their near-term and long-term impacts are anticipated to be, and how they support or leverage concurrent efforts – including impacts for DVCs.

Program Impact

- Address EPIC's mandatory guiding principle to provide ratepayer benefits defined as: (1) improving safety, (2) increasing reliability, (3) increasing affordability, (4) improving environmental sustainability, and (5) improving equity, all as related to California's electric system.[6]

Report Organization

- Ideally, administrators will organize reports around the Commission's adopted Strategic Goals[7] for efficiency of evaluating the progress of EPIC investments going forward to demonstrate ratepayer benefits and impacts in achieving the state's clean energy and climate goals.[8]

[1] Decision (D.)13-11-025 at Attachment 5 and D.23-04-042 at Appendix C.
[2] D.23-04-042 at 37.
[3] D.23-04-042 at 37.
[4] D.23-04-042 at Finding of Fact (FOF) 15.

Database Requirements

- To be in compliance, the EPIC database must be up-to- date at the time of annual report submission and contain sufficient information details to complement the annual report narrative, as described above.[9]

Regulatory Barriers

- Include any impediments or setbacks impacting project portfolios. This includes regulatory barriers that may impede sharing information or technology among those that could benefit from such information and technology transfer.[10]

Emerging Issues

- Requirements for annual reporting are minimum requirements — EPIC administrators are free to provide additional information providing context on their activities and plans to the Commission and stakeholders in their annual reports.
- Administrators may describe opportunities to leverage EPIC innovation investments for learnings and deployments for emerging issues and events to support rebuilding of populated areas impacted by natural disaster. Articulating such opportunities and challenges that may be encountered can help provide the Commission and stakeholders with a holistic view and understanding of EPIC's value (e.g., January 2025 Southern California wildfires; January 2025
  lithium-ion battery fire at Moss Landing).

[6] D.21-11-028 at OP 2 and at Appendix A.
[7] D.24-03-007 at OP 1.
[8] D.23-04-042 at 14-15.
[9] D.23-04-042 at 38.