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**PREPARED DIRECT TESTIMONY OF**  
**DANA GOLAN**  
**ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY**  
**CHAPTER 1**  
**(OVERVIEW OF SMART METER 2.0 PROPOSAL)**



**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

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**PREPARED DIRECT TESTIMONY OF  
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CHAPTER 1  
(OVERVIEW OF SMART METER 2.0 PROPOSAL)**

## I. INTRODUCTION

The purpose of this chapter is to provide an overview of the proposal by San Diego Gas & Electric Company (SDG&E) to modernize its Advanced Metering Infrastructure (AMI) system by replacing its aging smart meter (SM) 1.0 infrastructure and technology with SM 2.0, an updated platform designed to meet current operational challenges, support future advancements, and maintain customer affordability. As discussed below and in the accompanying testimony, uncertainty of access to SM 1.0 devices after 2028 poses significant risk to SDG&E's metering capability. Thus, a solution to address the situation must be in place well before that time. Accordingly, SDG&E requests approval to replace its obsolete SM 1.0 infrastructure with SM 2.0 devices and supporting technology, and requests authority to recover costs of approximately \$825 million between 2024-2031 including direct costs, contingency, overheads, and loaders.<sup>1</sup> The details of SDG&E's SM 2.0 implementation proposal and cost recovery request are addressed in more detail in the prepared direct testimony set forth in Chapters 2-6.

## II. TRANSFORMATIONAL ROLE OF SMART METER TECHNOLOGY

Nearly two decades ago, the California Public Utilities Commission (Commission) declared its commitment to “transform[ing] California’s investor-owned utility distribution network into an intelligent, integrated network enabled by modern information and control

<sup>1</sup> While SDG&E will continue to incur costs related to SM 1.0 until it fully transitions to SM 2.0, it will seek recovery of such costs through a separate application.

1 system technologies.”<sup>2</sup> In D.07-04-043, the Commission authorized SDG&E to install new,  
2 AMI-enabled, solid state electric meters and AMI-enabled gas modules capable of measuring  
3 energy usage on a time-differentiated basis. The Commission found that deployment of this  
4 infrastructure would “improve customer service by providing customer premise endpoint  
5 information, assist in gas leak and electric systems outage detection, transform the meter reading  
6 process and provide real near-term usage information to customers,” and would also support new  
7 technologies such as in-house messaging displays and smart thermostat controls.<sup>3</sup>

8 SDG&E began implementation of its SM 1.0 program in 2009. This program involved  
9 the installation of approximately 900,000 battery operated gas modules and approximately 1.4  
10 million electric meters throughout SDG&E's service area and largely concluded in 2011. SM 1.0  
11 represented a paradigm shift in electric and gas meter functionality. Implementation of SM 1.0  
12 infrastructure enabled new capabilities and benefits, allowing SDG&E to optimize operations by  
13 conducting over-the-air meter reading, remote connect and disconnects, and customer  
14 notifications. SM 1.0 functionality led to a reduction in manual meter reads, improved billing  
15 accuracy, and improved outage detection and response. Additionally, SM 1.0 advanced  
16 customer engagement and energy awareness. Indeed, SM 1.0 has delivered broad benefits across  
17 stakeholders: regulators and policymakers can design effective customer programs and rate  
18 structures; customers can analyze usage to manage costs; third-party retail electric commodity  
19 providers can develop innovative solutions; and schools and institutions can leverage data for  
20 time-of-use patterns and educational purposes. As discussed in the chapters that follows, these

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<sup>2</sup> Decision (D.) 07-04-043 at 2.

<sup>3</sup> *Id.*

1 capabilities and benefits have become the “new normal” – they are integral to utility operations  
2 and are a basic expectation of utility customers.

3 In 2005, when SDG&E filed its application seeking approval of SM 1.0, the technology  
4 was intentionally designed around the conditions and priorities of the early 2000s. At that time,  
5 the electric grid was still largely centralized and unidirectional; customer-side resources were  
6 minimal, and the primary objectives were to digitize the billing process, improve meter reads,  
7 and enhance basic outage visibility. In other words, the SM 1.0 system delivered what was  
8 required for that era. Twenty years later, the operating landscape has fundamentally changed.

9 Rapid growth in distributed energy resources (DERs) such as rooftop solar, behind-the-meter  
10 storage, and widespread adoption of electric vehicles (EVs) have shifted the distribution system  
11 from predictable and one-way to dynamic and variable. Grid complexity continues to increase  
12 across SDG&E’s service territory, and customer devices now interact with the grid in ways that  
13 were never contemplated during the design of SM 1.0. Looking ahead to the needs of 2030 and  
14 beyond, SDG&E must manage bi-directional power flows, customer energy demand volatility,  
15 and greater localized situational awareness of issues on the grid. The technology that was  
16 thoughtfully engineered to solve the problems of the past is no longer capable of supporting the  
17 grid of the future.

### 18 **III. APPROACHING OBSOLESCENCE OF SM 1.0**

19 The SM 1.0 technology considered in D.07-04-043 was state of the art at the time it was  
20 approved. However, the Commission explicitly acknowledged even then that the SM 1.0  
21 infrastructure would eventually require replacement. The Commission assumed a 17-year useful  
22 life for SM 1.0,<sup>4</sup> observing that it would need to be “substantially (if not wholly) replaced after

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<sup>4</sup> D.07-04-043 at Finding of Fact 7.

1 17 years,”<sup>5</sup> and noting its expectation that the approved AMI system will be “overtaken by a  
2 faster, cheaper and higher functioning AMI system that uses a different communications  
3 system.”<sup>6</sup> Applying this 17-year timeline to SDG&E’s SM 1.0 deployment during the 2009-  
4 2011 period, end-of-life for SM 1.0 electric meters and gas modules will occur between 2026-  
5 2028. Indeed, as discussed in more detail in Chapter 2, SDG&E has already begun to experience  
6 significant levels of SM 1.0 device failures. Compounding this problem is the fact that the  
7 market has shifted to newer and more effective networking technologies and is now looking  
8 ahead to SM 2.0; SDG&E has no guarantee that it will be able to procure replacement SM 1.0  
9 devices after 2028 and it faces end-of-support for SM 1.0 by 2035.

10 The deficiencies of SDG&E’s existing SM 1.0 infrastructure are creating significant  
11 customer service and operational challenges for SDG&E. Failing SM 1.0 devices lead to  
12 increased and persistent customer billing issues, including greater reliance on estimated bills,  
13 reduced access to timely usage information, and slower restoration visibility during unplanned  
14 outages. Device failures and aging supporting technologies, which are also increasingly prone to  
15 failure, place pressure on utility operations, system resiliency, and the service SDG&E provides  
16 its 3.7 million customers. Of particular concern is the fact that SM 1.0 device failures are  
17 approaching a point that exceeds the ability of the SDG&E’s Customer Field Operations  
18 workforce to respond, straining staffing, scheduling, inventory, and logistics. More broadly, the  
19 combination of increasing SM 1.0 device failures and approaching network obsolescence  
20 threatens the technological foundation of the utility’s AMI infrastructure, which impacts myriad  
21 essential utility functions including cybersecurity, data quality, and communication reliability.

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<sup>5</sup> *Id.* at 29.

<sup>6</sup> *Id.* at 31.

1 Put simply, replacement of SM 1.0 infrastructure is not optional, it is inevitable and must happen  
2 in the near-term. Given the lead-time necessary to implement SM 2.0 (discussed in Chapter 4),  
3 Commission approval of SDG&E’s SM 2.0 solution is necessary as soon as is feasible.

4 **IV. ESCALATING SM 1.0 FAILURES REQUIRES IMMEDIATE ACTION**

5 California is at the forefront of an energy transformation driven by ambitious climate  
6 goals and rapid technological change. Having been a provider of utility service for nearly as  
7 long as California has been a state, SDG&E constantly strives to fulfill its obligation to its  
8 customers in a way that protects reliability and safety, delivers excellent customer service, and  
9 maintains affordability. Indeed, customer service is at the heart of SDG&E’s mission; its  
10 objective is to serve customers by making every transaction easy, avoiding surprises, and  
11 understanding customers’ issues and concerns. SDG&E was an early adopter of smart meter  
12 technology, which dramatically improved operational efficiency and the customer experience.  
13 As SM 1.0 technology approaches obsolescence, SDG&E is looking ahead at targeted  
14 deployment of new smart meter technology that balances the twin goals of supporting customers’  
15 current needs – including protecting customer affordability – and “future-proofing” the metering  
16 infrastructure to ensure its ability to meet evolving customer expectations and support  
17 California’s policy vision by achieving a more intelligent, responsive, and resilient grid  
18 infrastructure.

19 As discussed above and in Chapter 2, SDG&E’s SM 1.0 electric meters and gas modules  
20 are failing at a rate that negatively impacts customers and imposes significant operational  
21 burdens on SDG&E. Moving to SM 2.0 now is necessary to enable SDG&E to proactively  
22 address the substantial and increasing challenges associated with SM 1.0. SDG&E is committed  
23 to delivering a solution that protects affordability while maximizing benefits for customers and

1 the grid. SDG&E's SM 2.0 proposal reflects a thoughtful balance between essential  
2 infrastructure replacement and strategic investment in capabilities that will support long-term  
3 customer value.

4 To promote affordability, SDG&E's SM 2.0 deployment approach seeks to adapt existing  
5 SM 1.0 infrastructure to the SM 2.0 environment to the greatest extent feasible. To this end,  
6 SDG&E will incorporate certain SM 1.0 systems into the SM 2.0 environment (Persistent  
7 systems) and undertake targeted replacement of other SM 1.0 systems (To-Be-Retired systems).  
8 SM 1.0 devices and the To-Be-Retired elements of SDG&E's existing SM 1.0 infrastructure  
9 must remain in place until the transition to SM 2.0 has been fully completed in order to ensure  
10 continuity of service. As is discussed in more detail in Chapter 3, SDG&E's SM 2.0 deployment  
11 strategy involves three primary areas of focus:

- 12 • **Replacement of Failing SM 1.0 Electric Meters and Gas Modules with SM  
13 2.0 Devices and Implementation of SM 2.0 Foundational Technology:**  
14 SDG&E will implement foundational technology that enables basic SM 2.0  
15 capabilities and that supports replacement of SM 1.0 electric meters and gas  
16 modules with SM 2.0 devices (Foundational Technology).
- 17 • **Implementation of SM 2.0 “NextGen” Technology to Support Enhanced  
18 NextGen Capabilities:** NextGen capabilities are a suite of advanced metering,  
19 analytics, and grid modernization features designed to improve operational  
20 efficiency and reliability, and improve the customer experience. These  
21 capabilities are incremental to basic SM 2.0 capabilities. SDG&E will implement  
22 NextGen technology necessary to enable the select NextGen capabilities  
23 identified in Chapter 3 (NextGen Technology).

- **Maintenance of Legacy SM 1.0 Technology, Including Legacy SM 1.0 Devices, During the Transitional to SM 2.0:** As noted above, elements of SDG&E’s existing SM 1.0 infrastructure must remain in place until the transition to SM 2.0 has been completed. The information regarding SM 1.0 provided in the chapters that follow is intended to assist the Commission in understanding the mechanics of the transition from SM 1.0 to SM 2.0.<sup>7</sup> SDG&E will seek to minimize the length of this transition period and limit further investment in SM 1.0 technology.

9                   Near-term transition to SM 2.0 is necessary to maintain existing SM 1.0 levels of  
10                   operational functionality and customer service. Beyond immediate operational improvements,  
11                   SM 2.0 electric meters offer a scalable platform for future enhancements. By incorporating  
12                   adaptability into the system design, SDG&E is well-positioned to integrate new technologies in  
13                   the future and to support evolving customer-facing applications. This approach supports  
14                   SDG&E's commitment to providing flexible, resilient, and innovative services that keep pace  
15                   with changing market expectations and regulatory requirements. SM 2.0 devices offer  
16                   significant enhancements such as the ability to process and transmit data at much higher  
17                   frequencies, enabling granular monitoring of electricity usage and grid performance. Unlike  
18                   earlier models that provide only periodic readings, SM 2.0 electric meters can record thousands  
19                   of measurements per second. This capability facilitates advanced analytics, including customer  
20                   insights, which helps SDG&E better understand and manage demand across the grid. SM 2.0

<sup>7</sup> SDG&E is not requesting recovery of the costs associated with maintaining operability of the SM 1.0 infrastructure in the instant application. It will request recovery of costs related to maintaining SM 1.0 in a separate application.

1 gas modules, likewise, offer superior functionality that will increase operational effectiveness  
2 and improve the customer experience.

3 **SDG&E'S PROPOSED SM 2.0 SOLUTION**

4 As discussed in Chapter 3, after the Commission's decision in SDG&E's most recent  
5 general rate case (GRC) proceeding directing SDG&E to file a separate application for approval  
6 of SM 2.0 implementation,<sup>8</sup> SDG&E sought to refresh its Smart Meter 2.0 planning by  
7 conducting an updated evaluation of the most critical capabilities required to meet customer  
8 expectations, existing and future operational needs, and emerging regulatory expectations.

9 SDG&E retained Ernst & Young to work with key internal stakeholder groups to identify SM 2.0  
10 use cases that not only resolve the current SM 1.0 challenges but also enable new functionalities,  
11 optimize operations, and achieve a flexible platform for the future. After mapping the identified  
12 use cases, SDG&E assessed the feasibility and complexity of implementing each through a  
13 Business Capability Maturity Assessment. SDG&E then evaluated each proposed capability  
14 based on strategic alignment, potential impact, and implementation complexity. The results of  
15 this process formed the foundation for SDG&E's 2025 SM 2.0 procurement strategy.

16 SDG&E conducted both a comprehensive Request for Proposals (RFP) process to solicit  
17 bids from established AMI vendors for replacement of electric meters and gas modules and  
18 supporting technology, and a Request for Quotation (RFQ) process to request information from  
19 its incumbent vendor regarding the feasibility of extending the life of SDG&E's current SM 1.0  
20 solution. SDG&E issued the RFP in March 2025, soliciting bids from the leading five smart  
21 meter vendors (including SDG&E's incumbent vendor). Two vendors responded to the RFP

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<sup>8</sup> See D.24-12-074 at Ordering Paragraph 51.

1 with comprehensive proposed solutions. SDG&E's incumbent vendor did not offer a bid into the  
2 solicitation.

3 The RFP followed a structured, multi-phased evaluation process to ensure thorough  
4 review and vetting of all proposals by the evaluation team, which included internal subject  
5 matter experts (SMEs) across electric and gas engineering, IT, operations, customer experience,  
6 meter shop, network infrastructure, and supply management functions. The evaluation team  
7 applied defined criteria related to technical performance, functional requirements, delivery  
8 requirements, bidder sustainability, commercial terms, future use case opportunities, supply  
9 chain, and other criteria. The evaluation team also considered the extent to which each  
10 proposal's SM 2.0 devices and supporting technology were designed for long-term adaptability  
11 and would support NextGen capabilities. SDG&E thoroughly evaluated each RFP bid with the  
12 objective of identifying the solution that would offer proven and robust technologies capable of  
13 meeting today's needs, while also demonstrating the extensibility, processing power, and feature  
14 depth necessary to meet future system demands. SDG&E's evaluation separately considered  
15 base features (*i.e.*, key functions and capabilities essential to present day operation of the smart  
16 meter system) and NextGen capabilities, which offer valuable enhancements that can be  
17 implemented at any time.

18 As detailed in Chapter 3, one vendor solution was the clear winner in terms of both cost  
19 and functionality. This solution not only satisfied the full set of evaluation criteria related to SM  
20 2.0 base features, but also offered a suite of mature, robust NextGen capabilities available to be  
21 deployed immediately or in the future. It directly addressed the limitations of SDG&E's current  
22 SM 1.0 system while also aligning with future regulatory and operational needs, delivering more  
23 functionality at a lower overall cost. The total estimated loaded cost of SDG&E's proposed SM

1 2.0 solution is \$825M, which covers immediate deployment of base functions and selected  
2 NextGen capabilities.

3 SDG&E's RFQ requesting information from its incumbent vendor, issued in April 2025,  
4 revealed material risk associated with the approach of seeking to extend the life of SDG&E's  
5 current SM 1.0 solution. SDG&E's Master Services Agreement (MSA) with the incumbent  
6 meter vendor expires in 2028. In the RFQ, SDG&E sought to assess the feasibility of  
7 maintaining its SM 1.0 infrastructure over the next two decades through like-for-like SM 1.0  
8 device replacements and technology upgrades.

9 The incumbent vendor has indicated that due to component obsolescence and  
10 technological advancements, the SM 1.0 platform specified in the current MSA is being  
11 transitioned to the supplier's next-generation solution. As a result, in the RFQ response, the  
12 incumbent vendor committed to working with SDG&E but did not guarantee sufficient supply of  
13 SM 1.0 devices between 2028-2035. Additionally, the incumbent vendor indicated that it could  
14 not secure guarantees from its suppliers (specific to RFLAN) to support SM 1.0 product  
15 availability or support beyond 2035. Based on these factors, the incumbent vendor advised  
16 SDG&E to develop a transition plan to ensure continuity and mitigate risk.

17 To confirm that its proposed SM 2.0 replacement approach is the optimal solution,  
18 SDG&E evaluated alternative options such as delaying SM 2.0 implementation to 2031 or 2032  
19 and continuing to replace failing SM 1.0 electric meters and gas modules with like-for-like SM  
20 1.0 devices in the meantime. As discussed in Chapter 3, the approach of delaying SM 2.0  
21 implementation to 2031 or 2032 is problematic for several reasons, including significantly  
22 increased cost (a delay to 2031 would raise costs by an estimated \$71.3 million, while a delay to  
23 2032 would increase costs by an estimated \$86.9 million), potential unavailability of replacement

1 devices, operational burdens, negative impacts on customer experience, and potential network  
2 vulnerabilities.

3 As a practical matter, uncertainty of access to hardware after 2028 poses significant risk  
4 to SDG&E's metering capability. Thus, a solution to address the situation must be in place well  
5 before that time. If a large number of installed devices were to fail, as is predicted in the very  
6 near term (see Chapter 2, Figure 2-3), SDG&E would lose connectivity with electric meters and  
7 gas modules, making it impossible to generate accurate timely bills, execute remote  
8 connect/disconnect orders, while also complicating the customer's ability to access usage data.  
9 Equally as concerning, continued reliance on the SM 1.0 platform, which may soon have limited  
10 or no manufacturer support, increases SDG&E's exposure to cybersecurity risks and would  
11 create other operational challenges. Thus, delaying SM 2.0 implementation and prolonging  
12 investment in obsolete technology will serve only to harm customers and degrade SDG&E's  
13 operational capabilities.

## 14 **VI. IMPLEMENTATION OF SDG&E'S PROPOSED SM 2.0 SOLUTION**

15 SDG&E proposes to implement SM 2.0 over a six-year period beginning with program  
16 mobilization, which includes vendor selection and contracting (both to occur in 2026), and  
17 establishing governance and program management frameworks. Following the mobilization  
18 phase, the focus will shift to development and implementation of Foundational Technology  
19 necessary to enable base SM 2.0 functions, and then to deployment of SM 2.0 electric meters and  
20 gas modules across the service territory in 2027. After implementation of SM 2.0 Foundational  
21 Technology and installation of SM 2.0 electric meters and gas modules, SDG&E will implement  
22 key Next Gen capabilities (discussed in Chapter 3) to enhance customer engagement and  
23 operations. The final stage of the SM 2.0 implementation process will involve retirement of

1 legacy SM 1.0 technologies and a comprehensive program close-out, ensuring a seamless  
2 transition to the upgraded platform. This timeline is discussed in more detail in Chapter 4. It is  
3 important to note that this timeline assumes adoption of a Commission decision approving  
4 SDG&E's application by the end of 2026.

5 SDG&E's SM 2.0 implementation plan also addresses stakeholder engagement and  
6 education. SDG&E is committed to building a proactive, inclusive, and transparent Marketing,  
7 Education and Outreach (ME&O) strategy for the transition to SM 2.0 that meets the evolving  
8 needs and expectations of its diverse customer base. As discussed in Chapter 4, SDG&E has  
9 designed a comprehensive ME&O plan that establishes a clear timeline, formal communication  
10 channels, and effective coordination with stakeholders. The ME&O plan emphasizes  
11 transparency in messaging, inclusivity in outreach, and customer empowerment through  
12 education and self-service resources to ensure that customers are able to fully leverage the  
13 benefits of the new SM 2.0 technology.

## 14 **VII. CONCLUSION**

15 Approval of SDG&E's SM 2.0 implementation proposal and timeline is essential to  
16 address the material risk presented by the increasing failures of SM 1.0 devices and the  
17 impending obsolescence of the SM 1.0 platform. SDG&E's SM 2.0 proposal is the result of a  
18 comprehensive RFP process and evaluation of multiple proposed solutions; it also takes into  
19 account information provided by SDG&E's incumbent vendor through the RFQ process.  
20 SDG&E's SM 2.0 strategy will preserve the benefits of SM 1.0, while meeting evolving  
21 operational and customer demands in a manner that is cost-effective and aligned with  
22 affordability goals. Delaying implementation of SM 2.0 would result in a reactive, high-cost  
23 replacement effort driven by widespread failures, disrupting operations and burdening customers

1 with avoidable expenses and service interruptions. Approval of SDG&E's implementation of  
2 SM 2.0 will benefit customers and improve operational efficiencies. Accordingly, the  
3 Commission should expeditiously approve SDG&E's request to implement SM 2.0.

4 This concludes my prepared direct testimony.

1      **VIII. WITNESS QUALIFICATIONS**

2            My name is Dana Golan and my business address is 8330 Century Park Ct., San Diego,  
3 California 92123. I am currently the chief customer officer for San Diego Gas & Electric  
4 Company (SDG&E) and the executive sponsor for the company's Smart Meter 2.0 Project. I  
5 also oversee all customer-related activities including customer services, digital channel  
6 management and strategy, field and meter operations, customer programs, business services, and  
7 revenue cycle activities. For the past 21 years, I have worked for SDG&E or its parent company,  
8 Sempra, in a variety of managerial and executive roles. I have a Bachelor of Arts in  
9 Communications Studies from the University of California Los Angeles and a Master of  
10 Business Administration from Pepperdine University.

11            I have previously testified before the California Public Utilities Commission.