Application No.: A.25-12-012
Exhibit No.: SDG&E-12
Witnesses: B. Baugh, S. Butler, and O. Zevallos

REBUTTAL TESTIMONY OF
BRADLEY M. BAUGH, SABRINA BUTLER, AND OMAR ZEVALLOS
ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY
CHAPTER 12
(SMART METER 2.0 DATA ACCESS)



BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

November 20, 2026

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REBUTTAL TESTIMONY OF BRADLEY M. BAUGH, SABRINA BUTLER, AND OMAR ZEVALLOS CHAPTER 12 (SMART METER 2.0 DATA ACCESS)

I. INTRODUCTION

This rebuttal testimony addresses arguments related to data access under the Smart Meter (SM) 2.0 proposal offered by San Diego Gas & Electric Company (SDG&E) set forth in the following intervenor testimony:

- Prepared Direct Testimony of Michael Murray on behalf of Mission:data Coalition (Mission:data) dated September 25, 2026
- Prepared Direct Testimony of Brian Walsh on behalf of Mission:data dated September 25, 2026
- Prepared Direct Testimony of Lucas Utouh and Kaitlin McGee on behalf of San Diego Community Power and Clean Energy Alliance (SDCP/CEA) dated September 25, 2026
- Prepared Direct Testimony of Samuel Golding on behalf of Utility Consumers Action Network (UCAN) dated September 25, 2026
- Prepared Testimony of the Public Advocates Office of the California Public Utilities Commission (Cal Advocates) dated September 25, 2026

SDG&E notes that the absence of a response in this rebuttal testimony to any particular issue raised or statement or proposal made by any party to this proceeding does not imply or constitute agreement by SDG&E with the proposal or contention offered by such party.

This testimony addresses issues raised by parties related to the Customer Insights: Real-Time Energy Monitoring capability, which SDG&E has proposed to include as an additional "NextGen" feature in its SM 2.0 solution. As explained in SDG&E's opening testimony, NextGen capabilities include "advanced metering, analytics, and grid modernization features designed to improve operational efficiency and reliability, and improve the customer experience."[1] NextGen capabilities are incremental to SM 2.0 base features (*i.e.*, key functions and capabilities essential to present day operation of the smart meter system) – they offer valuable enhancements that can be implemented at any time, now or in the future.[2] The

[1] Exhibit (Ex.) SDG&E-01, Prepared Direct Testimony of Dana Golan, Chapter 1 (December 18, 2025) (Ex. SDG&E-01 (Golan Direct)) at 6.

[2] *Id.* at 9.

Customer Insights: Real-Time Energy Monitoring capability provides customers with real-time visibility into energy usage within their home.[3] As proposed by SDG&E, this NextGen capability relies on a third-party grid-edge application running on the SM 2.0 meter that uses high-frequency meter data and advanced algorithms to generate appliance-level usage insights. The summarized results are transmitted to a third-party cloud platform, compiled in near real time, and made available to customers through an application (app) on a customer's mobile device (*e.g.* digital phone/tablet) or web portal. As discussed in more detail below, SDG&E proposed this feature as part of its proposed SM 2.0 solution to support Commission policies in favor of enabling customer access to energy usage data.

SDG&E agrees that providing customers with access to their energy usage information and enabling customer-authorized data sharing can support energy management, demand flexibility, distributed energy resource (DER) integration, and customer choice. SDG&E also agrees that Community Choice Aggregators (CCAs) require reasonable access to customer and meter information necessary to perform their authorized functions. The debate here is not over these issues; rather, the question is whether SDG&E's SM 2.0 proposal, including its proposal to include the Customer Insights: Real-Time Energy Monitoring capability complies with applicable statutory, regulatory and Commission requirements, including those related to near real-time access to meter data by customers and authorized third parties.[4] The answer to this question is yes.

As discussed in the sections that follow, SDG&E's SM 2.0 proposal complies with all applicable Commission decisions and Commission-approved tariff schedules and tariff rules. Parties' claims to the contrary are incorrect and reflect a misunderstanding of the Commission's various directives related to third party access to customer meter data. The Commission has implemented different rules for different data access pathways; the data access issues raised in parties' testimony relate to the following three separate pathways for access to customer meter data:

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[3] Ex. SDG&E-03, Prepared Direct Testimony of David Thai and Bradley Baugh, Chapter 3 (December 18, 2025) (Ex. SDG&E-03 (Thai/Baugh Direct)) at 30.

[4] Assigned Commissioner's Scoping Memo and Ruling (August 18, 2026) (Scoping Memo) at 4-5. *See* Scoping Issues 2.1 and 2.2(g).

(i) Access to "backhaul" data provided with customer authorization through SDG&E's "Green Button" function[5] – *i.e.*, energy usage data is provided "over the internet [and] hosted/presented by the utility or by a third party";[6]

(ii) "Near real-time"[7] access to meter usage data provided to customers and third parties through a physical "customer premises device" – *i.e.*, energy usage data is transmitted by a SM 1.0 meter and received by a commercially-available Home Area Network (HAN) device;[8] and

(iii) Access to meter data provided directly to CCAs pursuant to Public Utilities Code (Pub Util. Code) Section (§) 366.2(c)(9)[9] for billing and other purposes.

Parties misstate and, in some instances, improperly conflate the requirements applicable to each pathway, suggesting the existence of mandates that bear no relationship to the actual requirements that have been established by the Commission for each. Parties' proposals would require the Commission to read into existence new rules that do not currently apply to the data pathways identified above, and to address issues that are not properly within the scope of this proceeding. Parties' proposals to modify and expand existing data access requirements also ignore technical, cybersecurity, privacy, vendor readiness, market readiness, and cost considerations.

Section I provides an introduction to this chapter of the rebuttal testimony. Section II summarizes the two foundational Commission decisions issued in 2009 and 2011 that articulate the Commission's policy objectives relating to the backhaul (*i.e.*, Green Button) data access pathway and the near real-time (*i.e.*, HAN) data access pathway, and set separate implementation requirements for each. Section III rebuts several erroneous claims made by Mission:data witness, Michael Murray regarding SDG&E's current Green Button functionality. Section IV describes the policy background and Commission's prior decision-making related to accessing meter data through SM 1.0 HAN devices. Section V explores whether the policy goals

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5 The Green Button "backhaul" pathway collects the last 24 hours of data from electric meters and gas modules and provides the interval data on a daily basis. This data is at least a day old.

6 Decision (D.) 11-07-056 at 3, 106, and Ordering Paragraph (OP) 8.

7 *See* D.25-10-004, as modified by D.26-05-036, at 13-14, footnote 41 (internal citations omitted) (noting that the "'Real Time Usage Data Access Orders' do not clearly identify 'real-time' or 'near real-time' in terms of data latency").

8 D.11-07-056 at 4, 106-107, and OP 11.

9 All statutory references herein are to the Public Utilities Code unless otherwise noted.

articulated in the context of SM 1.0 deployment continue to apply today and should guide the Commission's decisions related to SM 2.0. Section VI discusses access to customer data by CCAs. Section VII addresses proposals to implement Direct Data Upload and Local Real-Time Access offered in this proceeding.

II. THE COMMISSION'S SMART GRID DECISIONS ADDRESSED ACCESS TO CUSTOMER METER USAGE DATA

The Commission's direction regarding (i) access to backhaul meter data through Green Button; and (ii) access to customer usage data through SM 1.0 HAN devices is grounded in two Commission decisions – Decision (D.) 09-12-046 and D.11-07-056 – issued in Rulemaking (R.) 08-12-009. R.08-12-009 was initiated by the Commission in 2008 to develop "'policies, standards and protocols to guide the development of a Smart Grid system and facilitate integration of new technologies such as distributed generation, storage, demand-side technologies and electric vehicles.'"[10]

In D.09-12-046, the Commission adopted policies and findings necessary to comply with regulatory requirements imposed on states by the Energy Information Security Act of 2007 (EISA) relating to Smart Grid.[11] In the decision, the Commission considered, among other things, whether to impose a specific provision articulated under EISA to require the three large investor-owned utilities (IOUs) to provide "access to information pertaining to their customers' electricity usage."[12] The Commission declined to adopt the proposed EISA requirement, finding that "prior Commission actions on implementing information disclosure policies in the context of the utilities' advanced metering initiatives [(AMI)] constitute a 'prior state action' . . . and make further action unnecessary to fulfill EISA requirements."[13] The Commission noted that it had "already adopted certain functional standards in its AMI proceedings that set requirements for the provision of information to customers," including standards related to (i) customer access to

[10] D.09-12-046 at 4 (citing the Order Instituting Rulemaking).

[11] *Id.* at 2.

[12] *Id.* at 40.

[13] *Id.* at 50.

energy usage information over the Internet (*e.g.*, backhaul data access);[14] and (ii) customer access through SM 1.0 HAN devices:

> Our understanding is that once a customer of [an IOU] has received an advanced meter, the customer will have access to his or her energy usage information via the internet with a one day lag. The energy usage information will be broken down into one hour intervals for residential customers and into fifteen minute intervals for commercial and industrial customers.
>
> ***
>
> The advanced metering projects approved by the Commission also include Home Area Network (HAN) devices that link to the new meters. A HAN device can enable price signals, load control and near real time data for electric customers.[15]

The Commission also separately considered the question of whether to adopt an EISA standard that would require an IOU to "facilitate the ability of its customers to have access to their usage information at any time through the Internet, or through any other means selected by the utility for Smart Grid applications."[16] The Commission, again, concluded that it was not necessary to do so, finding that "prior Commission actions implementing information disclosure policies in AMI . . . constitute a "prior state action" and therefore make further action unnecessary . . .."[17] The Commission observed further, "[e]ven though we decline to adopt this EISA standard, we share the opinion that customer access to usage information is a goal of this Commission, and should be a goal of IOUs in implementing a Smart Grid."[18]

The Commission noted the existence of "significant concerns" regarding data access, particularly by third parties, and the need for rules and policies concerning how a utility should provide secure access to data, both on a day-after basis and also on a near real-time basis:

> There are significant concerns, however, that the Commission must address as it relates to access, particularly by third parties, such as confidentiality, the security of the customer's information, and processes to allow for third parties to obtain access to the data with a customer's permission. We therefore plan to hold additional workshops and to take additional comments so that the Commission

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[14] *See id.* at Conclusions of Law (COL) 14 (distinguishing between "providing real-time or near real-time information via a HAN" as one pathway for conveying usage data, and "backhaul data via the internet on customer usage" as another.).

[15] *Id.* at 51.

[16] *Id.* at 56.

[17] *Id*.

[18] *Id.* at 63.

> can develop rules and policies concerning how a utility should provide a customer and third parties designated by a customer with secure access to the customer's energy usage information, both on a day after basis and on a near real-time basis.[19]

The Commission found in D.09-12-046 that to realize the benefits of AMI, "customers and authorized third parties need access to the information provided by the meters on a real-time or near real-time basis."[20] To accomplish this, the Commission directed that "each IOU be capable of providing a customer with an AMI meter with access to the customer's usage information on a near real-time basis by the end of 2011 should the customer desire that information."[21] It separately found that access to usage data over the Internet (*e.g.*, through the backhaul process) is necessary to realize the benefits of AMI "for customers who choose not to or are unable to invest in a HAN device . . .."[22] It directed that "by the end of 2010, the utilities will have put into place operations that allow customers to access their information easily through an agreement with a third party, provided sufficient privacy and security measures are in place to mitigate the potential for fraud and hacking."[23]

In D.11-07-056, the Commission developed rules to protect the privacy and security of customer usage data, as well as "policies to govern access to customer usage data by customers and authorized third parties."[24] In addressing provision of customer usage data "via the internet (or the backhaul),"[25] the Commission found that "[g]ranting third-party access to covered data from the utility when authorized by the customer is reasonable and in the public interest."[26] The Commission observed that while the decision established certain protections related to the backhaul data access pathway, there was a need for further consideration and resolution of issues arising from provision of third-party access to customer data over the backhaul.[27] To that end,

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[19] *Id.* at 63-64.

[20] *Id.* at Findings of Fact (FOF) 19.

[21] *Id.* at 65.

[22] *Id.* at FOF 21.

[23] *Id.* at 65.

[24] D.11-07-056 at 2.

[25] *Id.* at 113.

[26] *Id.* at 115.

[27] *Id.* at 113-115.

D.11-07-056 directed each IOU to file a separate application addressing provision of third party access to a customer's usage data via the utility's backhaul when authorized by the customer, and specified certain elements to be included in the application.[28] SDG&E subsequently filed Application (A.) 12-03-003 to establish its Green Button program, discussed below in Section III.

D.11-07-056 also separately addressed provision of access to "granular data through connecting a device to the Smart Meter."[29] The decision noted several issues related to near real-time data access through SM 1.0 HAN devices that required resolution and directed the IOUs to submit separate Tier 3 advice letters "to develop Smart Meter HAN implementation plans specific to each."[30] The Commission directed that each IOU's HAN Implementation Plan include an estimated rollout implementation strategy; it specified that the full rollout required SM 1.0 meters to transmit energy usage data to the home so that it could be received by a commercially-available HAN device.[31] The Commission explained that "[t]he goal of this roll out is to provide California customers with secure, private, and direct access to the disaggregated data available in Smart Meters."[32] SDG&E subsequently filed Advice Letter (AL) 2307-E discussed below in Section IV, to present its SM 1.0 HAN Implementation Plan.

III. ACCESS TO BACKHAUL METER DATA THROUGH GREEN BUTTON

In 2012, the North American Energy Standards Board (NAESB) established the Energy Services Provider Interface (ESPI) framework for exchanging customer-authorized energy usage data. SDG&E launched Green Button Download My Data in 2011 (as the first IOU in California) and its Green Button Connect My Data (Customer Energy Network) platform in 2012. In accordance with the Commission's direction in D.11-07-056, SDG&E filed A.12-03-003 on March 5, 2012, requesting Commission approval to provide third party access to customer interval usage data via the "backhaul" under an updated version of its existing Customer Energy Network (CEN) platform.[33] SDG&E's application was consolidated with

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[28] *Id.* at OP 8.

[29] *Id.* at 115-117.

[30] *Id.*; *see also* OP 11.

[31] *Id.* at 116-117; *see also* OP 11.

[32] *Id.* at 117.

[33] D.13-09-025 at 10-12.

those of Pacific Gas and Electric Company (PG&E) and Southern California Edison Company (SCE). The Commission approved the respective applications of the three IOUs in D.13-09-025, which addressed terms and conditions of service and other implementation issues. The decision directed that to the extent possible, the IOUs "shall offer a service that provides third parties access to customer usage data when authorized by the customer consistent with the privacy rules adopted in D.11-07-056 and D.12-08-045, under substantially similar terms and conditions."[34]

D.13-09-025 further required each IOU to submit a Tier 1 advice letter seeking approval of its tariff offering for its proposed backhaul data access service, and ordered the IOUs to "collaborate with each other, with third parties seeking the data, and with relevant standards-related organizations to develop common tariffs that, to the extent possible, are substantially similar in terms of standards, data platforms, data types, procedures for access to data by third parties, and methods of interacting with customers."[35] SDG&E subsequently submitted AL 2586-E[36] to establish SDG&E's service offering to allow third parties to access customer interval usage data through SDG&E's CEN platform or "Green Button Connect My Data" program, and to establish Electric Tariff Rule 34 (Release of Customer Data to Third Parties) to support implementation of the CEN/Green Button Connect My Data program. The advice letter and SDG&E's Rule 34 were approved via disposition letter issued on November 24, 2014.

SDG&E's Green Button platform provides customers with secure access to detailed customer usage data in a standardized format. "Green Button Download" allows customers to obtain and share historical consumption data. "Green Button Connect My Data" (Green Button Connect) established under Rule 34 allows customers to authorize third parties to receive their usage data through automated data-sharing arrangements. The platform supports customer energy-management tools, third-party services, and customer-informed energy decisions while maintaining privacy and security controls. As of October 31, 2026, the Green Button Connect service has 59 onboarded third parties authorized to receive customer data and approximately 18,000 enrolled customers, ~1.15% of electric distribution customers. It uses ESPI XML for

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[34] *Id.* at OP 17. D.12-08-045 extended the privacy protections adopted in D.11-07-056 to customers of gas corporations and CCAs, and to residential and small commercial customers of Electric Service Providers.

[35] *Id.* at OP 18.

[36] AL 2586-E was supplemented by AL 2586-E-A (approved November 24, 2014 and effective August 15, 2014).

historical, daily, and corrective consumption data; OAuth 2.0 for authorization; REST web services; SFTP for secure file transfer; and SDG&E's system for customer enrollment and activation.

In his testimony on behalf of Mission:data, Mr. Murray offers criticisms of SDG&E's Green Button Connect service based upon his experience initiating registration as a third party for Green Button Connect for the purpose of testing its functionality and observing "one SDG&E residential customer" attempt to authorize Mission:data to receive the customer's data via Green Button Connect.[37] Mr. Murray also alleges that SDG&E's Green Button Connect is "extremely outdated" inasmuch as it does not employ the current Version 3.3 of the Green Button Connect standard.[38] Finally, Mr. Murray asserts that the technical documentation provided by SDG&E to support Green Button Connect onboarding was outdated and had not been updated since September 1, 2019.[39] As a condition of approving the Application, Mr. Murray proposes that the Commission require SDG&E to (1) overhaul and modernize its Green Button Connect within six months; (2) provide annual proof of independent certification by the Green Button Alliance, based upon SDG&E's production system tested with real customers, to ensure ongoing compliance with the latest version of the Green Button Connect standard; and (3) provide timely technical support and up-to-date technical documentation.[40] Mr. Murray's proposals should be rejected on both procedural and substantive grounds, as discussed below.

A. Mission:data's Claims Regarding Green Button Connect are Outside the Scope of This Proceeding

SDG&E's SM 2.0 Application does not propose to change, replace, or materially modify the Green Button services provided under Rule 34. Accordingly, the alleged deficiencies identified by Mr. Murray and the remedies he proposes are not connected to the functionality or costs presented in this Application. Rather, they are properly within the scope of Commission Rulemaking (R.) 22-11-013 (Customer DER OIR**),** which is considering how customer and distributed energy resource (DER)-related data can be made more accessible while addressing

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[37] Mission:data, Prepared Direct Testimony of Michael Murray (September 25, 2026) (Murray Direct) at 43.

[38] *Id.* at 44-45.

[39] *Id*.

[40] *Id.* at 41.

privacy, cybersecurity, and grid-planning needs. On November 13, 2026, the Commission issued a proposed decision (PD) in R.22-11-013 that would continue statewide evaluation of data-access platforms, standards, application programming interfaces, privacy, cybersecurity, costs, and governance.[41] Importantly, the PD does not require utility-specific Green Button modernization.

Mission:data's proposals related to an overhaul of Green Button Connect, standards upgrade, and annual Green Button Alliance certification should not be imposed solely on SDG&E through this proceeding. Rather, any future Green Button requirements should be developed through a statewide process, supported by an implementation and cost record, and accompanied by an appropriate cost-recovery mechanism.

B. Mr. Murray's Claims Regarding the Purported Deficiencies in the Green Button Connect Onboarding Process are Not Adequately Supported and Fail to Acknowledge Delays Caused by Mission:data Itself

Mr. Murray's anecdotal description of an isolated instance of difficulty experienced by one customer and one third party in accessing SDG&E's Green Button Connect service hardly establishes that SDG&E operates the most "slapdash and haphazard" Green Button Connect program in the country, as Mr. Murray alleges.[42] More to the point, Mr. Murray ignores delays created by Mission:data's *own inaction*, as discussed below. SDG&E's records reflect that, of the 59 third parties currently enrolled in Green Button Connect, two, including Mission:data, have submitted requests for new or changed functionality in the past 18 months. SDG&E has no record of ongoing issues reported by the remaining third parties. Thus, SDG&E submits that Mr. Murray's claims regarding undue delay and deficiencies in SDG&E's process are not adequately supported and should be rejected.

Green Button Connect onboarding is a multi-phase process that requires active participation and timely responses from both SDG&E and the third party. The timeline varies depending on the third party's technical readiness, the completeness of the information provided, and the time required to configure and test the necessary file-transfer and authorization components. SDG&E's Green Button materials describe an onboarding process involving

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[41] R.22-11-013, *Proposed Decision Modifying Data Standards for Distributed Energy Resources* (November 13, 2026) at 13-20, 24–26.

[42] Murray Direct at 43.

multiple steps and note that the timing depends in part on the third party's level of engagement. The standard process for third parties to enroll and connect to SDG&E's Green Button Connect (GBC) platform consists of four phases:

1. Application and validation (approximately 1–2 weeks). The third party submits a web-based enrollment request. SDG&E reviews the application and validates that the third party is a legitimate organization by verifying its Employer Identification Number (EIN) through the Internal Revenue Service (IRS).

2. Connectivity information (timing depends on the third party). SDG&E asks the third party for additional information, such as points of contact and the scope of its application. SDG&E also provides the encryption keys required for secure file transfer protocol (SFTP) connectivity, with installation instructions. This phase is complete when the third party returns the requested information.

3. Testing and production approval (approximately 6–8 weeks). SDG&E configures the connection in its Electronic Data Interchange eXtended (EDIX) system and sends test files to the third party in its quality assurance (QA) environment. Once the third party confirms receipt, SDG&E repeats the test in production. If either test is unsuccessful, SDG&E works with the third party to resolve the issue. The new production connection is then submitted to SDG&E's information technology (IT) Change Advisory Board (CAB), a formal governance process that reviews changes to production systems for system reliability and customer data protection. Ongoing data transfers begin after CAB approval.

4. Publication and activation (approximately 5 weeks after the third party provides its application details). While CAB review is under way, SDG&E asks the third party for its application description, features, and other details to be published on SDG&E's website. The time to provide this information depends on the third party. SDG&E's Marketing and Communications team then reviews and approves the content. SDG&E publishes the application on its website for customer access and activates the third party in CEN.

Optional Open Authorization (OAuth) integration is offered. If the third-party requests OAuth integration, SDG&E creates and provides the required credentials and tokens. This step typically takes approximately two weeks and may proceed in parallel with activation.

Mr. Murray claims that he submitted Mission:data's third-party registration form on SDG&E's website on April 3, 2026, did not receive technical documentation until May 8, 2026, and after extended email exchanges and waiting for answers to basic questions, was admitted to SDG&E's production GBC on August 31, 2026, about five months after registration. He further asserts that he then tested GBC with one SDG&E residential customer over Microsoft Teams,

encountered numerous website bugs and defects, and that the customer could not complete the authorization, so no data was shared.[43]

SDG&E disagrees with the characterization that Mission:data's onboarding was unreasonably delayed by SDG&E or that SDG&E was notified of the customer authorization issues described in the testimony. As shown in Table 12-1 below, Mission:data's onboarding required approximately nine to ten weeks of SDG&E processing time, within or faster than these standard timeframes. **Approximately nine additional weeks elapsed while SDG&E awaited information from Mission:data**.

TABLE 12-1

MISSION:DATA ONBOARDING TIMELINE

Date	Fact	Details
April 3, 2026	Mission:data reports submitting its registration	Mission:data states that it submitted its registration form through SDG&E's website on this date and has a screenshot of what appears to be a successful submission. SDG&E has no record of receiving a submission on this date.
April 23, 2026	SDG&E acknowledged the application and started onboarding	SDG&E's records show the registration was received on this date, following Mission:data's follow-up and resubmission. SDG&E acknowledged Mission:data's application and initiated the onboarding process.
May 8, 2026	SDG&E validated the application and provided onboarding materials	SDG&E validated Mission:data's application and EIN. It then provided the Third-Party Guide, public keys, sample files, the New Third-Party Information Form, and the OAuth configuration worksheet. SDG&E also requested the SFTP information needed to begin connectivity testing. It advised that connectivity testing would proceed after it received the completed form and SFTP details.
July 7, 2026	Mission:data submitted the requested information	Mission:data submitted its OAuth worksheet, Third-Party Information Form, and initial SFTP details ***two months after SDG&E's request***.
July 8, 2026	SDG&E followed up on missing connectivity information	Additional connectivity information was still required in the requested format.

[43] *Id.*

July 11, 2026	SDG&E submitted the integration request	After receiving all required information, SDG&E submitted the file-transfer integration request to its EDIX support team.
August 2, 2026	QA testing initiated	SDG&E sent the QA test files to Mission:data.
August 6, 2026	QA testing completed	Mission:data confirmed that QA configuration and testing successfully completed.
August 9, 2026	Production authorized	The IT integration team authorized progression to production.
August 10, 2026	Production ticket opened	SDG&E opened the production deployment ticket.
Before August 20, 2026	Mission:data confirmed production files	Mission:data confirmed it had successfully received and parsed the production files.
August 20, 2026	Production deployment	SDG&E proceeded with production deployment.
August 21, 2026	SDG&E requested publication information	SDG&E requested Mission:data's data-scope selections, historical-data range, application description, and application features. The information was for publication in My Energy Center and on SDG&E's website.
August 26, 2026	Mission:data supplied publication information	Mission:data supplied the requested publication information.
August 28, 2026	Mission:data's UEnergyHub activated in CEN	SDG&E completed its CEN activation for UEnergyHub and also began provisioning OAuth.
August 31, 2026	OAuth provisioned	SDG&E completed OAuth provisioning and sent Mission:data the associated credentials, a process that can take up to two weeks. Mission:data was notified it could begin enrolling customers and that a valid customer enrollment would be needed to test the OAuth connection. SDG&E also invited Mission:data to contact Green Button Support with questions or requests for further help.

The documented chronology therefore does not support Mr. Murray's assertion that the extended onboarding period is attributable to failures by SDG&E. A significant portion of the elapsed time occurred between SDG&E's May 8 request for the required connectivity information and Mission:data's July 7 submission. After the necessary technical information was received and clarified, SDG&E completed QA testing, production deployment, publication,

and OAuth provisioning through a sequential, documented process. Onboarding was completed 130 days after April 23, the date SDG&E's records show the registration was received.

Regarding the customer authorization attempt described in the testimony, SDG&E's records do not show that Mission:data reported a customer enrollment creation failure or requested assistance investigating a customer authorization defect. On September 4, 2026, Mission:data advised that it was experiencing difficulty connecting and requested confirmation of the Green Button standard version used by SDG&E. SDG&E responded that same day, confirming that its implementation uses ESPI version 2.1 and inviting Mission:data to submit any additional questions.

It is not uncommon for new third-party enrollees to experience difficulties with the OAuth configuration when the connection is first established. For example, the enrollee's registration information may contain a misspelled server name or an incorrect authorization endpoint or callback uniform resource locator (URL). If the enrollee does not contact SDG&E after its first production test, SDG&E has no way of knowing about such configuration errors and cannot assist in troubleshooting.

The September 4 exchange mentioned a connection problem but did not specify any error messages, problem descriptions, website defects, unsuccessful customer enrollment or authorization attempts. Nor did it request troubleshooting or escalation of an enrollment issue. Accordingly, SDG&E was not provided with any information necessary to identify, reproduce, investigate, or respond to the alleged event before it was raised by Mr. Murray in his testimony. It is notable that Mr. Murray's testimony provides no evidence of the error, such as screenshots or error descriptions.

SDG&E reviewed the relevant system logs for the authorization attempt described in Mission:data's testimony. Those logs confirm that the enrollment and authorization functions operated as designed and that no customer data was transmitted to Mission:data before the customer completed the authorization process. Customer data is released through Green Button Connect only when two conditions are met: (1) the third party has been activated in CEN; and (2) the customer has completed enrollment and authorization with that third party. Whatever the cause of the incomplete authorization attempt, the customer's data remained protected.

C. SDG&E Provides Current Green Button Connect Technical Documentation

Mr. Murray alleges that SDG&E's Green Button Connect technical documentation is outdated and has not been updated since September 1, 2019, citing the Third-Party Guide attached to his testimony.[44] When Mission:data initiated its onboarding request, SDG&E mistakenly sent an outdated version of its documentation. SDG&E corrected this mistake and included the most recent documentation as an attachment to an email to Mission:data dated September 4, 2026, three weeks before Mission:data served its direct testimony.

SDG&E periodically reviews its GBC documentation. SDG&E's *Third-Party Guide Technical Information Packet* and *Authorization and Bulk Transfer in Green Button Connect My Data* were last revised August 19, 2024, and September 17, 2024, respectively.

D. SDG&E's Green Button Connect Complies with Applicable ESPI Requirements

Mr. Murray claims that SDG&E's Green Button Connect does not meet the NAESB ESPI standard referenced in Rule 34. He asserts that SDG&E uses custom comma-separated values (CSV) files for certain customer information instead of XML, that only one file appears to follow the ESPI format, and that SDG&E ignores other parts of the standard, such as the authorization process and access tokens.[45]

SDG&E acknowledges that ESPI version 2.1 is not the latest version of the ESPI standard published by NAESB. However, SDG&E's implementation includes protocols, such as OAuth 2.0, that were introduced after 2.1 was published.

SDG&E delivers its subscription file, which contains enrollment data for newly enrolled customers, in CSV format. All other files including historical, daily, and corrective customer consumption data are delivered in ESPI XML format. The updated GBC documentation SDG&E provided to Mission:data on September 4, 2026, explains that SDG&E's implementation uses ESPI XML files, ESPI schemas, OAuth 2.0 authorization, REST web services, and multiple Green Button Function Blocks associated with the ESPI 2.1 standard. SDG&E's GBC onboarding materials, technical documentation, and sample files provided to Mission:data describe SDG&E's process using ESPI version 2.1.

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[44] *Id.* at 45.

[45] *Id.* at 44.

E. SDG&E's Use of OAuth 2.0 Supports Secure ESPI-Based Authorization

Mr. Murray states that ESPI version 2.1 (dated August 30, 2013, according to NAESB) incorporates OAuth 1.0, while the current version, 3.3, incorporates OAuth 2.0. It describes OAuth 1.0 as not using Transport Layer Security, relying on weak cryptographic signatures, and being designated obsolete by the Internet Engineering Task Force. In the surrounding testimony, it argues that operating a 13-year-old standard is unreasonable and that SDG&E should update its GBC to the most current version.[46]

Mr. Murray argues that ESPI version 2.1 is "13 years old" and therefore inherently deficient; in other words, he equates the age of a technical standard with non-compliance or operational deficiency. However, the relevant issue is whether the implementation successfully provides customer-authorized data access in accordance with applicable standards and tariff requirements. Mission:data presents no credible evidence that operation under ESPI 2.1 prevents customer data sharing, violates Rule 34, or fails to satisfy any CPUC requirement. SDG&E's Green Button Connect platform supports 59 third parties that were able to successfully connect and continue to receive data from SDG&E's GBC – a fact that disproves Mr. Murray's contention.

F. SDG&E's Green Button Connect Uses Secure Authorization and Data Transfer Controls

Mr. Murray calls into question whether SDG&E's Green Button Connect is secure, suggesting that he was "unable to get even OAuth 1.0 to work on SDG&E's website" and therefore could not evaluate it.[47] He asserts that SDG&E combined two versions of Green Button Connect: an older version that uses file transfer protocol (FTP) without standardized, secure authorization, and a newer web-service version that also lacks a standardized authorization protocol.[48] These claims, and the suggestion that SDG&E's Green Button Connect is insecure, are unfounded and unsupportable.

SDG&E's Green Button Connect does not use FTP for file delivery; it uses SFTP, an industry standard for transferring files securely. In addition, SDG&E uses the OAuth 2.0 authorization framework, ***not*** OAuth 1.0 as Mission:data incorrectly implies.

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[46] *Id.* at 45.

[47] *Id.*

[48] *Id.* at 43.

In 2015 and 2016, SDG&E participated in industry efforts led by the Green Button Alliance to develop the Open Automated Data Exchange (OpenADE) standards. These efforts were coordinated by Martin ("Marty") Burns, representing the National Institute of Standards and Technology (NIST), and Donald ("Don") Coffin, an Executive Committee member of the Retail Markets Quadrant of NAESB, and included representatives from California utilities, AMI vendors, and interested third parties.

The resulting OpenADE documentation published in that same timeframe by the Green Button Alliance and Open Energy Information (OpenEI) combined the NAESB REQ.21 ESPI standard with the OAuth 2.0 authorization framework defined in Request for Comments (RFC) 6749 and bearer-token usage defined in RFC 6750. As a result, SDG&E implemented an updated GBC platform more than a decade ago that incorporates authorization consistent with the OAuth 2.0 authorization flow standards and the certification requirements in effect at the time and as specified in the documentation. Further, SDG&E's infrastructure and applications, including GBC, are regularly reviewed by its Cybersecurity processes to check for vulnerabilities.

After the release of ESPI version 2.0, SDG&E completed updates to its system in 2016. SDG&E's GBC platform, which operates on ESPI version 2.1, has continuously provided a mechanism for the ongoing exchange of customer-authorized usage data since that time.

IV. ACCESS TO METER DATA THROUGH SM 1.0 HAN DEVICES

A. Background

As discussed in Section II above, D.09-12-046 and D.11-07-056 establish the Commission's policies pertaining to near real-time data access under the SM 1.0 platform through commercially available HAN devices. The policies established by the Commission in these decisions and summarized in Resolution (Res.) E-4527 – and the requirements adopted to further those policies – reflect the SM 1.0 technology and market conditions that were in place in 2009-2011. In particular, the HAN-related policy guidance and implementation requirements adopted by the Commission acknowledged the reality that a physical "bridge" device was necessary to connect to the meter to provide near real-time data access and that such devices would be available *only* through the commercial retail market. Based on these circumstances, the Commission concluded that the IOUs must play an active role to support, at ratepayer expense, development of the commercial market for these devices by, among other things,

administering pilot programs designed to advance HAN device technology, developing interoperability standards and certification methodologies, and providing technical support, with costs to be borne by ratepayers.

For example, the Commission's statement in D.11-07-056 illustrates the logical relationship between the IOUs' actions to encourage the commercial availability of HAN devices (at ratepayer expense) and realization of the data access benefits assumed under the SM 1.0 deployment:

- "California ratepayers have incurred substantial costs to modernize the electric meters throughout the state."[49]
- "Many of the benefits of a Smart Meter arise from establishing a home area network that has access to the granular data produced by the Smart Meters."[50]
- Direct access to this granular data requires "connecting a device to the Smart Meter."[51]
- To provide near real-time customer data access, the IOUs' implementation must include "an initial phase with a rollout of up to 5,000 HAN-enabled devices to be directly connected with Smart Meters"[52]
- "The full rollout shall require smart meters to transmit energy usage data to the home so that it can be received by a HAN device of the consumer's choice."[53]
- The IOUs should "work with third parties, and other parties . . . to develop interoperability and security testing and certification methodologies to allow for tested and approved devices to be available for customer purchase."[54]
- "The goal of [the HAN] roll out is to provide California customers with secure, private, and direct access to the disaggregated data available in the Smart Meters."[55]

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[49] D.11-07-056 at 115.

[50] *Id.* at FOF 76; *see also* at 115.

[51] *Id.* at 115; *see also* D.09-12-046 at 51 ("A HAN device can enable price signals, load control and near real time data for electric customers.").

[52] D.11-07-056 at 116.

[53] *Id*.

[54] *Id.* at 117.

[55] *Id.*; *see also* D.09-12-046 at 63 (". . . customer access to usage information is a goal of this Commission, and should be a goal of the IOUs in implementing a Smart Grid.").

- "[T]he AMI decisions have already approved funding for the rollout of an activated HAN."[56]

In other words, the Commission acknowledged that many of the expected benefits of SM 1.0 were dependent upon HAN implementation and that HAN implementation would require availability of physical HAN devices, which would be accessible *only* through the commercial retail market. While it directed the IOUs to take affirmative action at ratepayer expense to promote the commercial availability of HAN devices, which benefitted competitive third-party HAN device manufacturers, it made clear that the primary policy objective underlying its requirements related to HAN implementation was to ensure that California customers received the data-related benefits of their investment in Smart Meters.

The Commission directed in D.11-07-056 that each IOU file a HAN Implementation Plan setting forth an "estimated [HAN] rollout implementation strategy."[57] The required elements of the HAN Implementation Plans, again, reflected the status of the technology in 2011 related to SM 1.0 and the need for a physical "gateway" device to receive usage data transmitted from the SM 1.0 meter. Given the key role played by these devices in realizing the near real-time data-related benefits of SM 1.0, and the fact that they would be available *only* through the commercial retail market, the Commission established a policy in favor of encouraging development of a retail market for SM 1.0 HAN devices. D.11-07-056 specified that the IOUs' HAN Implementation Plans must include:

(i) An implementation strategy, including a timetable, for making HAN functionality and benefits generally accessible to customers in a manner similar across all three companies;

(ii) An initial phase with a rollout of up to 5,000 HAN devices, which would allow for HAN activation for early adopters upon request, even if full functionality and rollout to all customers awaits resolution of technology and standard issues;

(iii) Discussion of key issues, such as:

a. Costs;

b. Expanded data access and data granularity;

c. Current and evolving national standards & security risk mitigation and best practices;

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[56] *Id.* at 117.

[57] *Id.* at OP 11.

d. Responsibilities for secure HAN connection;

e. Outcomes from working on HAN device interoperability;

f. Security testing and certification methodologies developed in collaboration with interested third parties, customer needs and preferences, a strategy for learning from the initial rollout, and provisions for accommodating customers' efforts to utilize HAN functionality independent of the utility; and

(iv) The full rollout shall require smart meters to transmit energy usage data to the home so that it can be received by an HAN device of the consumer's choice.

In Res. E-4527, the Commission reiterated and clarified the Commission's policy objectives related to HAN. As it did in D.11-07-056, the Commission made clear in Res. E-4527 that its HAN-related policies were intended to ensure that ratepayers received the expected benefits of the SM 1.0 meters approved in the Commission's AMI decisions:

> Access to the HAN function will allow customers to, in near real-time, monitor their energy consumption measured continuously by the smart meter and/or, in the future, receive and respond to load control signals (also referred to as demand response events). These capabilities enable customers to manage and optimize their energy consumption by identifying conservation opportunities and shifting/reducing peak hour demand to achieve bill savings. Such customer actions can yield system level demand reduction in aggregate which benefits the ratepayers in the form of avoiding future electricity supply costs, ***a key benefit driving California's investment in the Advanced Metering Infrastructure (AMI), also referred to as smart meters***.[58]

The Commission further explained that "activation of electric smart meters' HAN function to provide near real time access to energy usage data or demand response signaling is key to achieving certain ratepayer benefits planned for in the AMI business cases underlying the CPUC decisions to approve the Utilities' AMI deployments."[59] It emphasized that "the activation and widespread use of the HAN function is a key step in advancing California's energy policies and maximizing the benefits and return on the state's investment in the AMI infrastructure."[60] Of course, achieving "widespread use" of the HAN function would require broad commercial availability of third party HAN devices. The Resolution pointed out that, to this end, the Commission had issued various directives to the IOUs aimed at implementing a

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[58] Res. E-4527 (September 27, 2012) at 3 (emphasis added).

[59] *Id.* at 5.

[60] *Id.* at 6.

standards-based HAN communication protocol, developing consistent statewide HAN standards and deployment, and facilitating "efficient development of HAN technology and the associated marketplace . . .."[61] The Resolution noted that the funding necessary to support these IOU activities in support of the HAN function had been authorized in the Commission's prior AMI decisions.[62]

The Resolution observed that as of late 2012,[63] the IOUs had "made substantial progress in the implementation of the overall AMI infrastructure," with over 90% completion of the combined deployment of about 10 million electric smart meters, but that "HAN-related progress has been lagging."[64] The Resolution noted that the purpose of the HAN Implementation Plans ordered in D.11-07-056 was to 1) initiate HAN deployment, 2) make the HAN functionality and benefits generally accessible to customers on a consistent, statewide basis, and 3) enable a third party market that allows customers to utilize HAN devices of their own choice, independently of the IOU, to monitor their energy consumption.[65] It reviewed the HAN Implementation Plans submitted by the three IOUs and considered parties' protests to each. The Resolution summarized SDG&E's HAN Implementation Plan as follows:

> SDG&E's filing notes that it has already completed four HAN pilots in 2011 involving approximately 700 customers and devices using the HAN SEP 1.0 standard. With expiration of funding authorized for these pilots, SDG&E plans to explore other options to extend the pilots and eventually enable the 5000 HAN activations. The filing speculates that the timing for HAN "retail enablement" could be sometime in 2014.[66]

In responding to parties' protests, the Resolution provided guidance intended to clarify the IOUs' role in encouraging development of a commercial market for third party HAN devices and the extent of ratepayer funding approved for this purpose. The Resolution noted, for example, that market uncertainties impacting the timeline for HAN implementation are "best sorted out in the marketplace, with industry participants and customers conducting their own

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61 *Id.* at 6-7.

62 *Id.* at 8.

63 The Resolution was issued on September 27, 2012.

64 *Id.* at 6-7.

65 *Id.* at 10.

66 *Id.* at 13.

experimental trials of new technologies and services (such as, HAN suppliers performing "pilots" of their offerings with interested customers) or third parties initiating HAN-based service offerings at their own risk."[67] It concluded that "[t]his is best facilitated, we believe, by implementing a controlled HAN rollout with the utilities in a support role, as described in this Resolution's order. . . ."[68]

The Resolution noted certain deficiencies in the IOUs' respective HAN Implementation Plans.[69] To correct these deficiencies, the Resolution established specific implementation requirements necessary to satisfy the Commission's direction in Ordering Paragraph 11 of D.11-07-056, along with a compliance deadline for each, which were summarized in the Resolution as follows:

> 1. By January 15, 2013, the Utilities shall begin accepting HAN activation requests from customers through a common process and establish support for initially accommodating 5,000 HAN activation requests and gradually increasing to 200,000 requests, and thereafter unrestricted, on a specified timetable.
>
> 2. By December 1, 2012, the Utilities shall collaborate to establish and publish common requirements to validate interoperability between commercially available HAN devices and their electric smart meters.
>
> 3. By February 1, 2013, each Utility shall validate at least five commercially available HAN devices as interoperable with their smart meters, publish a list of the validated devices, and continue to expand the list based on additional device testing.
>
> 4. By December 15, 2012, the Utilities shall collaborate to begin providing basic education to their customers about the HAN functionality available with their smart meters and other details.[70]

The Resolution directed that the IOUs incorporate the requirements into a supplemental advice letter filing and execute their HAN Implementation Plans accordingly.[71] On October 29, 2012, SDG&E submitted its supplemental AL 2307-E-A setting forth its updated HAN

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[67] *Id.* at 15-16.

[68] *Id.* at 16.

[69] *Id.* at 19 - 21.

[70] *Id.* at 2, 28-31.

[71] *Id.* at 22.

Implementation Plan in accordance with the direction provided in Res. E-4527 and D.11-07-056. AL 2307-E-A was approved on March 27, 2013.[72]

SDG&E complied with the Commission's SM 1.0 HAN implementation requirements using a gateway with single Zigbee radio architecture. In D.22-12-009, the Commission found it reasonable to end funding for Zigbee support "[g]iven the move towards Wi-Fi and lack of vendors supporting Zigbee."[73] It noted that "new smart meter customers will not be utilizing Zigbee Technology," and that "[f]or SDG&E customers, there has been decreasing use of Zigbee technology among new customers for communicating meter data."[74] Mission:data and SDCP/CEA filed a petition for modification (PFM) of D.22-12-009, arguing that the decision should be modified to require SDG&E to reinstate Zigbee functionality until it provides new smart meters that provide near real-time energy usage data access.[75] The PFM was denied on procedural grounds.[76] The Commission noted that "SDG&E will be filing an application for the smart meter 2.0 program in the near future. Waiting until the next application cycle when a record can be developed and other alternatives can be proposed is the appropriate course of action."[77]

B. SDG&E Has Satisfied the SM 1.0 HAN-Related Requirements of D.09-12-046, D.11-07-056 and Resolution E-4527

Mission:data witness, Mr. Murray, asserts that the HAN-related requirements of D.09-12-046, D.11-07-056 and Res. E-4527 have never been modified and remain in effect.[78] He suggests that SDG&E's SM 2.0 proposal fails to comply with the "fundamental requirements"[79] of D.09-12-046, D.11-07-056, and Res. E-4527, including (i) ensuring the availability of a HAN device of the customer's choosing; and (ii) enabling a "third party market" for HAN devices and services. SDCP witness, Lucas Utouh, and CEA witness, Kaitlin McGee, similarly, argue that

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72 AL 2307-E-A, approved and effective March 27, 2013.

73 D.22-12-009 at 29.

74 *Id.* at COL 14 and 15.

75 D.25-10-004 at 12.

76 *Id.*

77 *Id.,* as modified by D.26-05-036 at OP 2.

78 Murray Direct at 12.

79 *Id*.

the SM 1.0 HAN-related requirements should continue to be enforced. They propose that SDG&E be required to re-implement Zigbee functionality on existing SM 1.0 meters during the interim period of SM 2.0 deployment and that the costs of doing so should be recovered through "the existing Smart Meter 2.0 Memorandum Account."[80] Mr. Utouh and Ms. McGee argue that the "existing capabilities" of SM 1.0 HAN devices must be a "core requirement of all future metering investments."[81]

These parties fail to distinguish between the *requirements* previously issued by the Commission in connection with SM 1.0 related to accessing customer usage data through a physical HAN device – *e.g.,* the requirements set forth in Ordering Paragraph 11 of D.11-07-056 and Ordering Paragraph 1a. – c. of Res. E-4527, and the Commission's *policies* regarding SM 1.0 implementation that provided the rationale for those requirements at the time they were imposed. In other words, the mandatory requirements established by the Commission related to HAN devices were tied directly to implementation of the IOUs' respective SM 1.0 programs, as discussed in Section IV.A above. The requirements reflected the specific technological configuration of SM 1.0 (*e.g.*, SM 1.0 meters that required a commercially available HAN device to provide an interface with the smart meter to receive transmitted usage data) and the practical need for development of a retail market for third party HAN devices, which justified allocating costs related to development of such a market to ratepayers. SDG&E complied with the HAN-related requirements included in Ordering Paragraph 11 of D.11-07-056 and Ordering Paragraph 1a. – c. of Res. E-4527 years ago as part of its SM 1.0 implementation. Indeed, as the Commission noted in Res. E-4527, SDG&E was "extremely supportive of the Commission's vision and direction to enable the Home Area Network retail market."[82] No party points to a Commission finding of non-compliance and, in any event, SDG&E's past compliance with the 2012 and 2013 compliance deadlines established in Res. E-4527 and reflected in its approved HAN Implementation Plan are not within the scope of issues the Commission must determine in this case.

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[80] SD CCAs, Prepared Direct Testimony of Lucas Utouh and Kaitlin McGee (September 25, 2026) (Utouh/McGee Direct) at 30.

[81] Utouh/McGee Direct at 28.

[82] Res. E-4527 at 23.

Moreover, as discussed above, the Commission terminated SDG&E's obligation under prior Commission orders to support HAN devices using Zigbee technology in 2022. Since *all* HAN devices in SDG&E service territory relied on Zigbee technology, this had the practical effect of suspending the SDG&E's SM 1.0 obligations relating to HAN devices. Moreover, in the ruling affirming its decision approving SDG&E's request to suspend Zigbee support, the Commission noted its expectation that "other alternatives" (*i.e.*, alternatives other than the physical HAN devices used with SM 1.0 meters) would be considered in connection with SDG&E's SM 2.0 proposal.[83] Given this explicit statement by the Commission, the suggestion that the "requirements" set forth in Ordering Paragraph 11 of D.11-07-056 and Ordering Paragraph 1a. – c. of Res. E-4527 related to SM 1.0 are yet to be complied with or even *could* be applied in the context of SM 2.0 defies logic.

Finally, while Mr. Utouh and Ms. McGee suggest that SDG&E discontinued the Zigbee functionality, this assertion is incorrect.[84] SDG&E's existing SM 1.0 meters still only connect via Zigbee technology, and some SM 1.0 meters remain connected even today. What is true is that SDG&E discontinued its ongoing support of Zigbee devices to be paired with its SM 1.0 meters. As discussed above, the Commission approved discontinuation of support for Zigbee nearly four years ago.[85] Thus, the proposal by Mr. Utouh and Ms. McGee that the Commission require full restoration of Zigbee HAN functionality at this point, even on an interim basis, makes little sense.[86] Plainly, it would be unreasonable to require ratepayers to bear the cost of a full relaunch to support outdated technology that very few customers have requested. Accordingly, SDCP/CEA's ill-advised proposal should be rejected.

V. THE COMMISSION SHOULD EXAMINE WHETHER THE POLICY GOALS ARTICULATED IN THE CONTEXT OF SM 1.0 DEPLOYMENT CONTINUE TO APPLY TODAY

The suggestion by Mr. Murray, Mr. Utouh, and Ms. McGee that the Commission must enforce the "requirements" of D.09-12-046, D.11-07-056, and Res. E-4527, is best understood as

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[83] D.25-10-004, as modified by 26-05-036 at OP 2.

[84] *See* Utouh/McGee Direct at 30.

[85] SDG&E ended its contract in 2023 for HAN device pairing support with the vendor offering it. That vendor is also no longer supporting Zigbee HAN device pairing with meters.

[86] *See* Utouh/McGee Direct at 30.

a proposal that the Commission endorse in the context of SDG&E's SM 2.0 proposal, the policy objectives adopted in connection with the IOUs' implementation of SM 1.0. In particular, their arguments require reevaluation of the following policy goals related to customer data access through HAN devices articulated by the Commission in D.09-12-046, D.11-07-056, and Res. E-4527: (1) ensuring that customers have the ability to monitor their energy consumption measured continuously by the smart meter in near real-time;[87] and (ii) encouraging development, at ratepayer expense, of a competitive, third-party retail market for products necessary to enable customers to monitor their energy consumption in near real-time.[88]

A. Consideration of Whether SM1.0 HAN Policies are Relevant in the Current Environment

1. Policy in favor of enabling customers to monitor their energy consumption through the meter in real time or near real-time

In Res. E-4527, the Commission explained that customers' ability to monitor their energy consumption in near real-time would allow them to "manage and optimize their energy consumption by identifying conservation opportunities and shifting/reducing peak hour demand to achieve bill savings."[89] The Commission identified this ability as a "key benefit" of California's investment in SM 1.0. The discussion in Res. E-4527 reflects the Commission's statement in D.09-12-046 that "customer access to usage information is a goal of this Commission and should be a goal of IOUs in implementing a Smart Grid."[90]

In its SM 2.0 Application, SDG&E proposes inclusion of the incremental Customer Insights: Real-Time Energy Monitoring NextGen capability in order to provide customer access to meter usage information, consistent with the Commission's policy goal articulated in D.09-12-046. As discussed above and in SDG&E's opening testimony, the Customer Insights: Real-Time Energy Monitoring capability provides customers with real-time visibility into energy usage within their home through a web portal or app on their phone.[91]

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87 *See* Res. E-4527 at 3.

88 *See id* at 7.

89 *Id.* at 3.

90 D.09-12-046 at 63.

91 Ex. SDG&E-03 (Thai/Baugh Direct) at 30.

Cal Advocates urges the Commission to reject SDG&E's proposal to include the incremental Customer Insights: Real-Time Energy Monitoring NextGen capability in its SM 2.0 program. It asserts that SDG&E "fails to justify a business need for its Customer Insights NextGen request," and that D.09-12-046, D.11-07-056, and Res. E-4527 "do not require SDG&E to provide real time data through its specified solution."[92] Cal Advocates challenges SDG&E's assumption that customer interest in a near real-time meter data access solution exists, pointing out that "SDG&E fails to clarify why its customers did not use HAN prior to 2022, but require Customer Insights now."[93]

SDG&E proposed inclusion of the incremental Customer Insights: Real-Time Energy Monitoring NextGen capability to further the policy objective of providing real-time or near real-time customer access to meter usage information and because, unlike with SM 1.0, the ability for customers to have real-time visibility into energy usage within their home is readily available and easily enabled with the proposed SM 2.0 meters, albeit at some cost to ratepayers. Given the Commission's current focus on preserving affordability for ratepayers, however, SDG&E acknowledges that affordability goals may take precedence over the policy objectives articulated in the context of SM 1.0 implementation, including the goal of enabling customer access to meter usage information. SDG&E also concedes the validity of the question raised by Cal Advocates regarding demonstrated customer interest (or lack thereof) in real-time monitoring of usage data.

If the Commission agrees with Cal Advocates that the benefits associated with the Customer Insights: Real-Time Energy Monitoring NextGen capability do not justify the cost that would be borne by ratepayers, this aspect of SDG&E's SM 2.0 proposal can be severed without impacting its proposed SM 2.0 base solution.

If the Commission concludes that insufficient customer demand exists to justify enabling real-time visibility into energy usage at ratepayer expense through Customer Insights: Real-Time Energy Monitoring NextGen capability, it could still find that any customer demand that does exist can be adequately served in the future by the retail market (*e.g.*, the commercial product

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[92] Ex. CA-01, Prepared Testimony on the Application of SDG&E for Approval of SM 2.0 Proposal (September 25, 2026) (Ex. CA-01 (Cal Advocates Direct)) at 5-22 – 5-23.

[93] Ex. CA-01 (Cal Advocates Direct) at 5-23.

developers represented by Mission:data[94]). To the extent it makes this finding, however, the Commission should specify that all costs related to development of commercial products providing real-time meter usage data access, including but not limited to testing and certification, should be borne by the developer rather than by ratepayers. In this scenario, the commercial product developers could continue to follow standard processes for development of retail products, including certification and testing by the SM 2.0 meter vendor and the meter owner (here, SDG&E) to develop the products they offer to customers. This product development process is explained in more detail in Section V.B below.

Finally, SDG&E notes that customer engagement with energy usage has evolved beyond reliance on HAN technology and now includes multiple channels and tools, many of which do not require real-time data. For example, customers can access My Energy Center to review information about their energy usage. Customers can also receive Energy Alerts designed to help them monitor their bills and energy usage, including weekly updates and alerts tied to customer-selected dollar thresholds, with notification preferences available through email or text. These tools complement other programs and services SDG&E offers to help customers better understand, manage, and adjust their energy consumption.

2. SM 1.0 policy in favor of encouraging development, at ratepayer expense, of a competitive, third-party retail market for commercial products offering real-time meter usage data access

In addition to its SM 1.0 policy in favor of enabling customers to monitor their energy consumption through the meter in near real-time, the Commission articulated a separate policy in favor of requiring the IOUs to be actively involved, at ratepayer expense, in supporting development of a competitive, third-party retail market for HAN devices.[95] As discussed above, because the SM 1.0 solution required physical HAN devices to operate as a "gateway" to the SM 1.0 meter, and because this was necessary to derive the expected benefits of SM 1.0, it was critical that customers be able to obtain these HAN devices. The need to ensure that customers *could* actually obtain HAN devices provided a rationale for the Commission to facilitate development of a competitive, third-party retail market for HAN devices. However, the

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[94] *See* attached Appendix A (Mission:data Responses 1 and 4 to SDG&E DR 001) and Appendix B (Mission:data Response 10 to SDG&E DR 002) referencing its membership comprised of commercial product developers.

[95] Res. E-4527 at 3, 7.

requirement to take an active role in promoting development of the commercial HAN device market in connection with SM 1.0 implementation placed a significant burden on SDG&E, as well as imposing ratepayer costs. It is less clear that the implementation burden and the ratepayer expense associated with IOU support for development of the commercial market is justified now, over a decade later, particularly given the Commission's overarching concerns related to customer affordability.

As noted above, SDG&E sought to comply with the specific SM 1.0 implementation requirements set forth in D.11-07-056 and Res. E-4527 using a gateway with single Zigbee radio architecture. In accordance with its approved HAN Implementation Plan, SDG&E collaborated for some considerable time with the other electric IOUs to design a standardized, transparent, well-documented process that would serve all three utilities the same.[96] This was also beneficial for device manufacturers which would have their devices tested in one territory according to the approach, and it would find the same practice and approach used by all IOUs statewide.

SDG&E publicly marketed invitations to HAN device manufacturers to make them aware that SDG&E would begin to receive applications by manufacturers to have their specific devices submitted, tested and approved to connect to SDG&E's SM 1.0 meters. Each manufacturer was required to submit individual applications for each model and different type of HAN. At the launch of the program, the HAN devices were physically submitted to SDG&E's in-house laboratory and testing center where such testing took place. Later, testing was outsourced and devices were tested at a separate testing center operated by a third party for a fee to the device manufacturer. Each device was logged, tested, examined, and recorded as having either a "pass" or "fail" result. The manufacturer was then provided with the results for each type or model they had submitted.

HAN devices that passed were listed on SDG&E's HAN website, which had been built for the manufacturers of "approved devices" able to pair with SDG&E's SM 1.0 meters. SDG&E also provided customer education material regarding HAN devices approved for use with SDG&E's SM 1.0 meters. A manufacturer's validation guide was created and updated to

[96] The device testing process by the IOUs included development of a testing plan which outlined a list of items that would be tested in the devices (the validation guidebook outlined what protocols, what security, etc.), a standardized application form, & standard documents that included a terms and conditions sheet as well as a waiver of liability signed by the manufacturer, etc..

describe the requirements and discuss the standards their devices were expected to adhere to. There were also email inboxes set up for both manufacturers and customers to inquire about certain HAN devices, the status of particular device testing, their ability to pair with the meters, and/or troubleshoot problems. As extensive resources were required to support these efforts, SDG&E created a HAN group to manage the webpages, devices, initial testing, logging, communications via email and phone, etc.

SDG&E also contracted with a vendor to manage the Zigbee pairing of devices with SDG&E's SM 1.0 meters. Once a customer obtained an approved HAN device of their choice through a retail purchase, they were able to provide their meter number, account number, and HAN identification and then request device pairing through an online system. The vendor also performed troubleshooting of customers' issues in cases where the devices did not pair. For example, sometimes, the device was located too far away from a Zigbee meter, or there were other site issues that prevented pairing such as concrete walls interfering with the Zigbee signal. There was always extensive customer communication and support offered to try to solve each of these types of issues. Supporting the HAN offering therefore required ongoing vendor contract management, invoice processing and customer support for more than 10 years, with the associated costs ultimately borne by ratepayers.

The HAN devices would need to conform to industry communications standards using the Zigbee standard for the "front door" communications with the meters. The HAN devices would also be tested to ensure that there was no possibility of the device being easily hacked through some open, even inadvertent, "back door" in the device. SDG&E received many HAN devices for testing from new start-up companies at the time, and each had varying degrees of sophistication since Zigbee technology was new. Many of these devices never passed the testing phase. Also, many HAN devices did eventually pass but did not pass the first time they were tested. In these cases, SDG&E communicated with manufacturers about what kinds of defects were identified, so that the manufacturer could choose to solve the problem and resubmit their device for further testing. This is especially important to note since often in this space, adhering to communication standards is discussed, without the discussion of cyber-security which is a separate issue (and addressed in Sections V.B, V.C, VI and VII below in detail).

From a "lessons learned" perspective, SDG&E notes that the requirement for IOUs to support development of the commercial HAN device market was extremely resource intensive

and imposed significant ratepayer cost. Under SM 1.0, SDG&E supported Zigbee-based HAN device connectivity for more than a decade to provide near-real-time customer data access by enabling a successfully tested list of HAN devices to connect, providing a portal to request the device and meter pairing, and with communications and education to both manufacturers and customers to assist them along the way. However, as the technology environment changed over time, requests for pairing greatly decreased to an average of less than five customers per year in the last years of the HAN device connectivity offerings.

SDG&E submits that the commercial market for energy-related software products has matured over the past 15 years – indeed, Mr. Murray touts the 20+ technology company members of Mission:data who offer "consumer-focused, data-enabled energy savings for homes and businesses," and deliver their solutions to a national market.[97] Mr. Murray does not suggest that any Mission:data members are currently utilizing real time data or a HAN to facilitate such solutions for their customers. It is, therefore, logical to conclude that these commercial product developers are using other data access pathways such as Green Button data, at 15-minute intervals, and/or a KYZ[98] interface to create useful load shape models and analyze energy usage. In addition, current meter vendors may offer an established pathway for third party developers to offer commercial products; for example, the meter vendor selected through SDG&E's RFP process offers a "toolkit" to enable development of customer-facing commercial products, as discussed in Section V.B below. Thus, SDG&E submits that it is not necessary at this point for the IOUs to take an active role in "encouraging development" of a commercial market for these services; commercial developers have sufficient ability to respond to market demand without requiring a boost from the IOUs. Likewise, while customers may pay the cost of data access services they receive from third party product developers, it would not be appropriate for ratepayers to bear the market development-type costs they were required to pay in the context of SM 1.0 implementation. Rather, the costs associated with developing new commercial products, including but not limited to testing and certification costs, should be borne by the third-party developers of such products.

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[97] Murray Direct at 1.

[98] In the energy metering world, KYZ functionality refers to a pulse output interface on an electric meter that allows energy usage data to be sent to external equipment such as Energy Management Systems (EMS), SCADA systems, building automation systems, or data loggers. *See, e.g.*, eaton.com.

Should the Commission nevertheless determine that its previously-articulated policy in favor of encouraging development of a competitive, third-party retail market for SM 1.0 commercial devices should be applied *now*, in evolved form, to require action by SDG&E to promote a competitive market for third party developers in the context of SM 2.0, further Commission guidance would be required regarding, among other issues, allocation of the costs associated with promoting a competitive market for third party developers, as well as the scope of any such requirement.

B. The Development Process for Third-Party Commercial Products Under SDG&E's Proposed SM 2.0 Environment

The grid-edge computing capabilities of the SM 2.0 meters proposed as part of SDG&E's SM 2.0 solution are technically facilitated through a comprehensive edge application ecosystem that includes important roles for the SM 2.0 vendor, the utility as meter owner, and third-party developers of commercial products offering access to meter usage data in real-time. The SM 2.0 solution proposed by SDG&E would enable third party developers to utilize the SM 2.0 vendor's "toolkit" to develop a customer-facing application (app) or product through the following process:

1. **The Developer Environment: Tools to Develop Edge Apps**: Both utility teams and third-party application developers can request access to the suite of tools and resources offered by the SM 2.0 vendor to create edge applications. Once access is granted, developers will have access to an application development environment, including a software development toolkit (SDK), optional accompanying hardware, learn-to-code resources, and an anticipated online community/web forum for developers.

2. **App Testing: Ensuring Security, Reliability and Performance**: All apps must pass a qualification review before they are eligible for publication in the app storefront, regardless of whether they are developed by the utility, developed on the utility's behalf through a request for proposal (RFP), or created independently by a third-party developer. As part of this process, the SM 2.0 vendor performs application qualification activities, including source code review and run-time analysis, to assess compliance with cybersecurity, performance, and resource utilization requirements. The review also confirms that the application will not interfere with the meter's core operational functions.

3. **App Storefront: Where the Software Meets the Utility**: Developer offerings that pass the SM 2.0 vendor's app testing requirements will then be available to allow such an app to pair with SDG&E's meter via the SM 2.0 vendor's edge app storefront. The meter app storefront catalog presents apps, tracks versioning, ensures device compatibility, and enables utility procurement should the utility wish to add the app. The storefront functions much like Google Play or the Apple

App Store, but it is designed for utilities rather than the general public. For cybersecurity and other reasons, the utility must be involved in determining through a validation and testing process that involves the third-party developer which third party apps are deployed within its edge meter network. As part of the process for determining which apps may be deployed within the utility's edge meter network, the utility must conduct cybersecurity reviews and testing, execute appropriate cyber and customer data privacy agreements with third-party app providers, and complete app-specific configuration and validation testing prior to making the app available to customers. Apps may be purchased by the utility to offer to the customers (*e.g.*, the real-time data access app SDG&E proposes to provide to customers as part of its Customer Insights: Real-Time Energy Monitoring NextGen capability) or, within the constraints mentioned in this section, offered to customers directly by a third party in the future (*e.g.*, such as through a subscription payment model).

4. **The Utility App Management System: Administering the Edge**: The utility app management system is a platform that provides the utility the necessary tools to operate and oversee the edge ecosystem. It securely imports grid-edge applications acquired through the storefront; manages app registration, distribution, installation, and lifecycle activities; monitors devices and applications through dashboards, reporting, and operational oversight; manages application updates; facilitates communication between edge applications and possible cloud-based components; and supports secure application removal and sensitive-data deprovisioning.

5. **Customer Configuration & Integration**: Edge applications offered by the utility that provide customer-facing services may require additional setup by the customer, including registration with the utility's My Energy Center web site to enable the application and, if applicable to the service, pairing the customer's Wi-Fi router in order to send data to an associated destination, such as a cloud service.

Figure 12-1 below depicts the phases and tools involved in the edge application ecosystem from development to deployment and the various actors and functions required to implement both consumer-facing and grid-facing applications.

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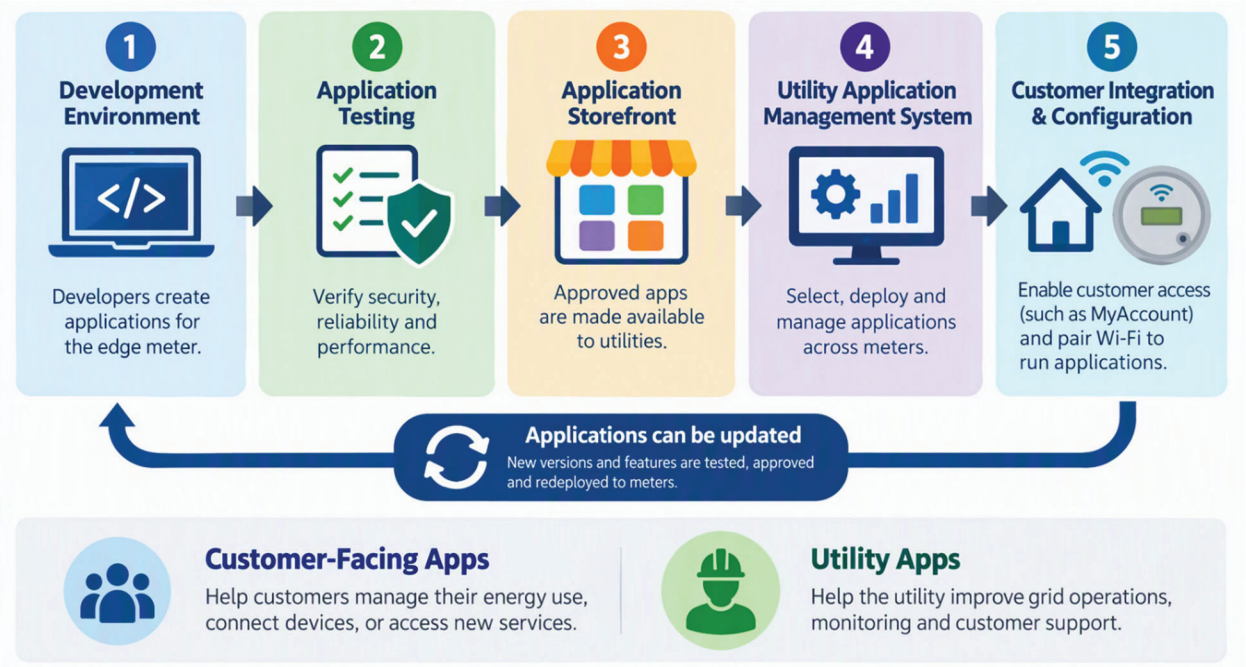
FIGURE 12-1



Thus, SDG&E will have the technical meter-related platform with the capabilities to support eventual third-party product developers who may develop commercial product offerings for real-time usage data monitoring.

C. The Commission Should Reject Parties' Erroneous Claims and Unreasonable Proposals

1. SDG&E's proposed SM 2.0 solution does not prevent third parties from offering real-time usage data products or impose unreasonable requirements on commercial developers in the future

Mr. Murray asserts that SDG&E's SM 2.0 solution would make it "impossible for customers to use any energy management service in conjunction with their AMI 2.0 meter, other than the service SDG&E proposes to offer."[99] He claims that "SDG&E admitted in discovery that that SDG&E will not allow any other device or service to connect to meters."[100] He further alleges that SDG&E is seeking an "exclusive arrangement" with the SM 2.0 vendor that would prevent other product developers from being able to connect to customer meters to benefit

[99] Murray Direct at 7 *see also* Utouh/McGee Direct at 28-29.

[100] *Id.* at 8.

customers.[101] Finally, Mr. Murray suggests that in order to gain access to the same real-time data as is available through the app/web portal included in SDG&E's proposed Customer Insights NextGen capability, "competitive firms would need to purchase and install their own submeters."[102]

These statements by Mission:data are incorrect. While SDG&E does not specifically identify *additional* third-party commercial products to be included as part of its SM 2.0 proposal, beyond the software application provided as part of the proposed Customer Insights: Real-Time Energy Monitoring capability, that does not mean that the availability of such commercial products could not be facilitated within SDG&E's SM 2.0 program, if the Commission so ordered. As discussed in Section V.B above, third party commercial developers will need to follow a clearly defined process and utilize an existing toolkit to create and offer commercial data access products. There would also be costs to support a retail enablement market for real time apps or devices. If the Commission elects to require SDG&E to facilitate availability of such commercial products, it would need to address issues related to cost recovery, lifecycle governance, vendor readiness, cybersecurity, testing, validation, and other critical issues in a separate statewide proceeding involving IOUs and other stakeholders, as it did with SM 1.0.

2. Mission:data's proposals related to allocation of testing and certification costs, and the costs of time interval reprogramming, are unreasonable and should be rejected

Mr. Murray challenges the need for cybersecurity evaluation of commercial software applications intended for customer meters[103] and indicates that he is "opposed" to certification and testing fees for commercial developers of real-time data access software.[104] As discussed above, however, certification and testing, including cybersecurity risk assessment, is necessary before <u>*any*</u> software application can be permitted to access the customer meter. The need for this testing and certification process is universally understood among IT professionals and is standard practice in the software development world; any credible commercial developer of a software product would expect to undertake testing and certification of its product. The costs associated

[101] *Id*.

[102] *Id.* at 23.

[103] *Id.* at 34.

[104] *Id.* at 31.

with testing and certification of a commercial software product are a "cost of doing business" and should be borne by the third-party developers of such products. In fact, third parties submitting Zigbee devices to be tested before being allowed to connect to SDG&E's AMI 1.0 meters were charged a fee to have their HAN devices tested before connecting.[105] Allocating these costs to utility customers, as Mr. Murray appears to propose, is unreasonable, departs from established precedent and is inconsistent with the Commission's affordability objectives.

Similarly, Mr. Murray proposes that "[a]s a condition of approving the Application, the Commission should require SDG&E to reprogram meters when necessary at zero cost to ratepayers or service providers."[106] Mr. Murray neither explains why he suggests that this operational cost would be borne by utility shareholders, nor provides any precedential support to justify this proposal. The Commission should reject both proposals.

3. Proposals by Mission:data and SDCP/CEA to move commercial customers away from KYZ-compatible meters should be rejected

Mr. Murray suggests that the real-time data usage app provided to residential customers as a component of the Customer Insights: Real-Time Energy Monitoring capability also be provided to Commercial and Industrial (C&I) customers.[107] Mr. Utouh and Ms. McGee, similarly, contend that SDG&E's proposal improperly excludes commercial and other non-residential customers from the real-time data access benefits of SM 2.0. They argue that commercial customers should obtain near-real-time meter data through the Wi-Fi capabilities of the new commercial meters rather than continue to rely on KYZ functionality and customer-side energy-management systems.[108]

These proposals are inapposite and should be rejected if the Commission approves the Customer Insights: Real-Time Energy Monitoring capability. The load disaggregation functionality of this capability is designed for residential usage patterns; it is not suited to the more complex usage patterns of non-residential customers. For example, non-residential

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[105] After the initial testing rollout, the IOUs outsourced the testing to two contracting testing facilities which charged the manufacturer directly for testing their HAN devices or Zigbee thermostats.

[106] Murray Direct at 36.

[107] *See id.* at 29-30.

[108] Utouh/McGee Direct at 29 – 30.

customers often have heterogeneous, multi-tenant, poly-phase, and operationally complex load profiles. In the commercial sector, energy management systems have been served by alternative architectures, not inferred load level disaggregation. SDG&E's SM 2.0 proposal includes commercial grade meters that are KYZ output capable, where appropriate, to enable the integration with customer-side systems. KYZ outputs are offered today to customers and third-party providers to obtain granular consumption data, supporting real time energy monitoring.

4. Mission:data's proposal to immediately implement Direct Data Upload and Local Real-Time Access is ill-considered and should be rejected as premature

Mr. Murray proposes that the Commission order enablement "from day one" of Direct Data Upload[109] (DDU) and Local Real-Time Access[110] (LRA), which are mechanisms that enable customers to access and share near-real-time energy usage data.[111] This recommendation is extremely ill-advised and should be soundly rejected.

As discussed in detail in Section VII below, there are a number of unaddressed and unresolved issues with DDU/LRA relating to standards selection, interoperability requirements, cybersecurity protections, certification frameworks, system integration, operational support, lifecycle governance, vendor readiness, and cost responsibility that must be addressed before such functionality could be implemented on a fleet-wide basis. While SDG&E is not opposed to examining this technology for possible future implementation, any such evaluation should occur in a separate statewide Commission proceeding that involves all three IOUs and other interested stakeholders, and comprehensively addresses issues including, but not limited to, those identified in Section VII below.

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[109] Direct Data Upload (DDU) is a capability that allows a smart meter to transmit a customer's energy usage data directly to a customer-authorized third-party over the customer's internet connection, directly from the customer's meter without first routing the data through the utility's back-office systems or requiring additional equipment in the home. Under this model, customers choose and control the organizations that receive their data and can modify or revoke access at any time.

[110] Local Real-Time Access (LRA) is a capability that allows customer-authorized devices, such as smart thermostats, electric vehicle chargers, home energy management systems, or other connected equipment, to obtain real-time energy usage data directly from the smart meter over the customer's local Wi Fi network.

[111] Murray Direct at 28; *see also* 25 – 28.

5. Mission:data and UCAN fail to distinguish between general SM 2.0 platform capability and the functionality proposed in the Application for immediate adoption

Mr. Murray contends that SDG&E has not sufficiently documented the relationship between the SM 2.0 platform's Wi-Fi and edge-computing capabilities and the customer-facing functions that will be implemented. He argues that the presence of these capabilities supports broader DDU, LRA, application, and device-access requirements and that the current proposal does not fully enable the platform's functionality.[112]

SDG&E disagrees that general hardware capability establishes an implementation commitment. SM 2.0's Wi-Fi and edge-computing capabilities provide a foundation for current and future applications, but each application still requires defined requirements, configuration, integration, testing, cybersecurity review, operational support, vendor commitments, lifecycle management, and cost evaluation. The Commission should evaluate the Application based on the functionality actually proposed, designed, costed, and supported in the record rather than assume that *every* function the hardware may technically support is – or must be – included in the current deployment. Approval of the SM 2.0 proposal presented in the Application does not foreclose the possibility of implementation of additional features at a later time.

Likewise, Mr. Murray mischaracterizes SDG&E's testimony regarding customer-side Wi-Fi use cases and its subsequent discovery responses describing the currently scoped Customer Insights: Real-Time Energy Monitoring capability as inconsistent. Mr. Murray suggests that SDG&E first described broad customer-side capabilities and then narrowed the proposed functionality in discovery.[113] SDG&E disagrees with this characterization. SDG&E's opening testimony generally describes the Smart Meter 2.0 platform's Wi-Fi and edge-computing capabilities and their potential to support multiple customer-side use cases; the discovery responses describe more narrowly the specific Customer Insights: Real-Time Energy Monitoring capability included as part of the SM 2.0 solution proposed in the Application. In other words, the statements referenced by Mr. Murray describe the platform and the proposed application at different levels of specificity; they do not establish that every technically possible function is included in the current procurement or implementation plan. While functionality

[112] *Id.* at 21-23 and 25-30.

[113] *Id.* at 22.

beyond what is contemplated in the Application is feasible, SDG&E is not proposing adoption of *every* function available through SM 2.0 at this time.

Mr. Murray suggests that the Commission should direct SDG&E to explore various standards in a separate Commission proceeding, including IEEE 2030.5, Matter, EBUS, and other interoperability technologies, to inform future design choices.[114] While SDG&E does not take a position here on any of these technologies, and notes that the existence of candidate standards does not establish a Commission-adopted DDU or LRA application profile for this proceeding, it agrees that the type of technological review Mr. Murray describes should be undertaken, if at all, in a separate statewide proceeding. In any event, the SM 2.0 platform is capable of supporting *multiple* communications standards.

Finally, UCAN witness, Mr. Golding, contends that SDG&E's proposed framework does not provide sufficient customer access to meter data and recommends conditions of approval intended to secure customer access and support accountability as Smart Meter 2.0 capabilities are implemented.[115]

SDG&E does not oppose continued evaluation of additional interoperable customer-access capabilities. SDG&E disagrees, however, that approval of the Customer Insights: Real-Time Energy Monitoring capability should be conditioned on an open local interface before the applicable protocol, device-enrollment process, authentication requirements, certification framework, cybersecurity controls, support obligations, costs, and benefits are sufficiently defined. Approval of the Customer Insights: Real-Time Energy Monitoring capability does not require the Commission to determine that the proposed application-based model procured by the utility must remain the only access pathway throughout the life of SM 2.0. Additional capabilities may be evaluated as standards, technology, customer need, market readiness, and the supporting record develop

[114] Murray Direct at 26.

[115] Utility Consumers' Action Network (UCAN), Prepared Direct Testimony of Samuel Golding Before the Public Utilities Commission of California (September 25, 2026) (Golding Direct) at 100–108, 119.

6. The Commission should reject Mission:data's proposals to require IEEE 2030.5 or other defined standards and certifications as a condition of approval

Mission:data argues that the Commission should require defined standards compliance and certification, particularly IEEE 2030.5, as a condition of SM 2.0 approval. Mission:data relies in part on approaches adopted in other jurisdictions and contends that a specific standard would promote interoperability, customer choice, and third-party access.[116]

SDG&E disagrees that the present record supports prescribing IEEE 2030.5 or another specific architecture as a condition of approval. IEEE 2030.5 has not been adopted as a statewide California Smart Meter requirement, and an approach selected in another jurisdiction does not substitute for a California record addressing technical feasibility, multi-utility compatibility, vendor readiness, cybersecurity, customer and operational requirements, costs, and implementation timing. If the Commission determines that a common technical standard should govern California smart-meter deployments, that issue is better addressed through a broader standards process with appropriate technical participation and a complete multi-utility record.

The Commission also should not convert a candidate standard into an implementation mandate without evidence that the required functionality is included in the proposed configuration, can be securely integrated, satisfies an adopted interoperability and security profile, is independently testable and certifiable, is supported by vendors over the equipment lifecycle, and has been evaluated for cost, operational impact, customer need, and benefit.

Mr. Murray points to product capabilities, technical standards, and implementations in other jurisdictions to argue that comparable functionality should be required for SDG&E. He assumes that a feature demonstrated by a vendor or adopted elsewhere can be translated into an SDG&E fleet-wide requirement.[117] The comparisons drawn by Mr. Murray are inapposite and should be disregarded.

SDG&E disagrees that those examples establish implementation readiness or regulatory reasonableness in this Application. Vendor claims and external deployments may be relevant evidence, but they do not establish compatibility with SDG&E's selected configuration, systems, cybersecurity architecture, operating model, customer-support processes, procurement terms, or

[116] Murray Direct at 13–15.

[117] *Id.*

cost assumptions. California implementation also requires a record addressing applicable Commission requirements, multi-utility interoperability, governance, certification, lifecycle support, and cost recovery.

References to Texas next-day interval-data delivery or Colorado Wi-Fi access may inform future evaluation, but they do not establish that the same services, market rules, data associations, customer protections, interfaces, cost allocation, or operating responsibilities apply to SDG&E. Before relying on an external implementation as proof of feasibility or reasonableness, the comparison should identify the relevant architecture, governing requirements, customer classes, data product, processing status, performance metrics, security model, costs, and responsible entities.

7. Other proposals offered by Mission:data would require further analysis and should be considered in a separate statewide proceeding, if at all

Other proposals offered by Mr. Murray, including his recommendations related to terms of service (*e.g.*, termination and re-authorization requirements),[118] the Wi-Fi enablement process,[119] non-discrimination principles,[120] requirements for notification of changes to the technical standard or implementation,[121] and technical support provided by SDG&E to third party service providers,[122] should be considered by the Commission, if at all, in a separate statewide proceeding involving all stakeholders, including the IOUs. This was the approach taken by the Commission in the context of the SM 1.0 proceeding and is the appropriate approach here for any issues raised by Mr. Murray that the Commission intends to consider.

VI. CCA ACCESS TO CUSTOMER DATA

A. Background

CCAs are electric load-serving entities (LSEs) formed by cities and counties to provide retail electric commodity service to their local residents and businesses. CCA customers continue to receive their distribution services (including metering service), transmission service, and

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[118] Murray Direct at 30 – 31, 33.

[119] *Id.* at 32.

[120] *Id*.

[121] *Id.* at 32-33.

[122] *Id.* at 33.

billing service from the IOU. The Commission's regulatory framework governing CCAs' access to customer data is based on the requirements of Section 366.2(c)(9). Section 366.2(c)(9) directs, among other things, that IOUs provide billing and electric load data as determined by the Commission and in accordance with procedures established by the Commission:

> All electrical corporations shall cooperate fully with any community choice aggregators that investigate, pursue, or implement community choice aggregation programs. **Cooperation shall include providing the entities with appropriate billing and electrical load data, including, but not limited to, electrical consumption data as defined in Section 8380 and other data detailing electricity needs and patterns of usage, as determined by the commission, and in accordance with procedures established by the commission.** The commission shall exercise its authority pursuant to Chapter 11 (commencing with Section 2100) to enforce the requirements of this paragraph when it finds that the requirements of this paragraph have been violated. Electrical corporations shall continue to provide all metering, billing, collection, and customer service to retail customers that participate in community choice aggregation programs. Bills sent by the electrical corporation to retail customers shall identify the community choice aggregator as providing the electrical energy component of the bill. The commission shall determine the terms and conditions under which the electrical corporation provides services to community choice aggregators and retail customers.[123]

In 2004, the Commission adopted "[r]equirements for and conditions under which CCAs can acquire customer information from utilities needed to manage energy procurement by CCAs."[124] The Commission concluded that "Section 366.2(c)(9) requires the provision of detailed billing and load data to CCAs that are investigating, pursuing or implementing CCA programs,"[125] and directed the IOUs to establish tariff provisions addressing metering, billing, customer services, and other services.[126] In 2019, the Commission provided further guidance regarding the obligation articulated in Section 366.2(c)(9) that IOUs "cooperate fully" with CCAs that are investigating, pursuing, or implementing CCA programs. It pointed out that "the IOUs' primary relationship with the CCAs is as a billing agent," and observed that the IOU's obligation to support to the CCAs is not unbounded: "the Commission has explained that 'cooperate fully' is reasonably interpreted to mean that utilities shall facilitate the CCA program

[123] Pub. Util. Code § 366.2(c)(9) (emphasis added).

[124] D.04-12-046 at 5.

[125] *Id.* at COL 32.

[126] *Id.* at OP 2.

and a CCA's efforts to implement it to the extent reasonable and in ways that do not compromise other utility services."[127]

SDG&E's approved Electric Tariff Rule 27 sets forth the terms and conditions governing the services SDG&E provides to CCAs offering retail electric service in SDG&E's service territory. SDG&E's approved Electric Tariff Schedule CCA-INFO establishes the rates and conditions applicable to SDG&E's provision of customer data to CCAs, while its approved Electric Tariff Schedule CCA establishes the rates and conditions applicable to the billing and other services provided by SDG&E, including meter service.

The data delivery process currently in place to provide CCAs with customer interval and billing information was developed jointly by SDG&E and its regional community choice aggregators, SDCP/CEA, and the associated fee structure was approved by the Commission in 2023. At the CCAs' request, SDG&E designed and implemented a "Data Lake" to provide customer interval information to CCAs within approximately 24 to 48 hours after power flow. SDG&E AL 4288-E describes the joint development process and proposed "Data Lake" service as follows:

> SDG&E and the two active CCAs in its service territory, San Diego Community Power (SDCP) and Clean Energy Alliance (CEA) have been actively pursuing a solution to provide both CCAs with access to billing-quality interval meter data on a more frequent cadence than the existing system for billing data sharing allows. Currently, SDG&E's billing quality data is sent once a month for each customer through the Electronic Data Interchange (EDI) to each CCA for processing based upon the customer's corresponding billing cycle.
>
> The solution that SDG&E and the CCAs have agreed to will provide CCAs with self-service, on-demand availability of customer interval data within a few days of the meter read. Each CCA will only have access to interval meter data for customers enrolled in their individual respective service. The same level of customer information currently provided in the EDI transactions will be made available. A critical component of the solution is the ability for each CCA to self-serve and retrieve customer information as they need it on a daily basis rather than waiting to receive the information at the end of the customer billing cycle. Therefore, the data will be made available through an Application Programming Interface (API) for the CCAs to be able to access the interval data directly, within two to three days after meter read. This creates a model for CCAs to retrieve and use data as needed and not be dependent on SDG&E's existing interval data billing process.

[127] D.19-07-004 at 139.

> There are two components to the cost structure for the service; a monthly fee that supports cloud storage of the data itself, and a fee to query the data via the API. The monthly storage fee is a fixed cost that will be assessed proportionally to each CCA based on the amount of data associated with each CCAs respective market share, as measured by the number of meters in their service. The API query fee is based upon the specific number of requests that the CCAs and/or their back-office provider make per day.[128]

It is important to note that SDG&E's SM 2.0 proposal <u>does not change</u> this approved data delivery process. The existing data delivery process will continue as contemplated in AL 4288-E. The existing process includes multiple stages that are necessary to support data quality for billing and settlement purposes:

1. Meter information is collected through the meter Head-End System (HES);
2. It is then processed through the Meter Data Management System (MDMS), where applicable validation, estimation, and editing occur;
3. The information then passes to the Customer Information System (CIS) for additional processing, including associating the information with the appropriate customer and CCA, formatting it for the applicable CCA delivery process, and performing additional estimation for certain complex metering configurations; and
4. The resulting information is made available to the CCAs through the CCA Data Lake and billing-related processes.

The Data Lake is designed to provide customer interval information to CCAs within approximately 24 to 48 hours after power flow. This is consistent with the discussion in AL 4288-E, which explained that the agreed-to solution would provide customer interval data "within a few days of the meter read."[129]

SDG&E dedicates full-time employee resources to work with the CCAs and their back-office provider to identify and resolve billing, data, and other operational issues as they arise. This ongoing coordination is part of SDG&E's standard operating process and is not overseen by the Commission. SDG&E meets weekly with the CCAs' back-office provider, and separately with each CCA at a cadence established with that CCA. As of the date of this testimony, SDG&E meets biweekly with SDCP and monthly with CEA. This collaborative process has also supported improvements to CCA data access. For example, the CCA Data Lake was developed

[128] AL 4288-E (approved November 29, 2023 and effective October 26, 2023) at 2-3.

[129] *Id.* at 3.

through coordination among SDG&E, the CCAs and their back-office provider. Since implementation in 2023, SDG&E has continued to work with the CCAs to enhance the availability of customer interval data.

B. The Issues Raised by SDCP/CEA and Proposals Offered are Outside the Scope of this Proceeding

In their joint testimony, Mr. Utouh and Ms. McGee assert that LSEs such as SDCP and CEA must have access to individual customer's real-time data and must "receive interval meter data at the same latency and granularity as SDG&E receives the data itself."[130] Mr. Utouh and Ms. McGee argue that the Commission must ensure "data parity" – a term that appears nowhere in the Section 366.2(c)(9) – between SDG&E and CCAs. They offer a proposed definition of "data parity" that would modify the existing Rule 27 and CCA-INFO tariff schedule to establish significant new requirements for data access by CCAs.[131] Mr. Utouh and Ms. McGee go so far as to suggest that CCAs' access to customers' meter data in real time is an "implied requirement" of D.09-12-046, D.11-07-056 and Res. E-4527.[132] This is incorrect. As discussed above, the Commission requirements related to CCA access to customer meter data are based on Section 366.2(c)(9), not the Commission's SM 1.0 HAN implementation-related directives.

Mr. Utouh and Ms. McGee suggest that if CCAs do not have "data parity" with SDG&E, CCA customers will be disadvantaged because the demand response (DR) programs offered by SDCP/CEA (*i.e.*, "demand-side" activities) will not be as cost-effective as they otherwise might be, and SDCP/CEA's electric procurement through the California Independent System Operator (CAISO) energy market (*i.e.*, "supply-side" activities) will be less efficient.[133] Mr. Utouh and Ms. McGee further contend that CCAs must have access to the "non-consumption data" used by SDG&E's electric distribution function for purposes of managing grid operations, including interval voltage data, phase identification, waveform data, distribution feeder and secondary topology information, and distribution transformer asset attributes.[134]

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[130] Utouh/McGee Direct at 12.

[131] *Id.* at 22.

[132] *Id.* at 32.

[133] *Id.* at 12.

[134] *Id.* at 22; *see also* at 13.

As discussed below, the arguments offered by Mr. Utouh and Ms. McGee lack merit and fall well outside the scope of issues to be considered in this proceeding. The new proposals included in the joint testimony of Mr. Utouh and Ms. McGee (and a related proposal offered by Mission:data witness, Brian Walsh) should be soundly rejected. In addition, Mr. Utouh and Ms. McGee raise concerns regarding delays in delivery of interval metering data under the current delivery process caused by a programming anomaly.[135] While SDG&E believes that this kind of technical operational issue is best handled through the SDG&E/CCA business operations process described above, it provides a brief explanation of the problem and identified solution here for the Commission's information.

1. CalCCA's "Data Parity" Proposal is Outside the Scope of this Proceeding

Mr. Utouh and Ms. McGee urge the Commission to impose a new "data parity" requirement to ensure equivalence of data access between SDG&E and CCAs. They propose the following definition of "data parity":

> Data parity should mean that CCAs and other LSEs receive the same customer energy usage data that SDG&E receives as close to equivalent timing, frequency, latency, granularity, and completeness as is technically feasible. Information should be delivered through documented, standards-based interfaces that allow the applicable LSE and authorized third parties to integrate data into customer service platforms, forecasting tools, dynamic pricing operations, and DR and DERMS systems.[136]

The Commission should summarily reject this proposal. Major revision of the existing CCA data access rules is not within scope of this proceeding. Indeed, in identifying the data access issues to be addressed in this proceeding, *the Commission does not discuss data access by CCAs pursuant to Section 366.2(c)(9) at all*.

The scoping memo in this proceeding asks only whether the proposed SM 2.0 project "will provide near real-time access to energy consumption or demand response in a usable electronic format (to both bundled and unbundled customers and authorized third parties with customer consent) in compliance with applicable law and Commission directives."[137] In other words, the scoping memo's question related to data access focuses on the customer near real-

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[135] *Id.* at 41.

[136] Utouh/McGee Direct at 22.

[137] Scoping Memo at 5.

time data access issues discussed in Section IV and V above; the scoping memo does not explicitly include the separate issue of CCA data access within the scope of this proceeding.

The scoping memo does include a general question regarding whether SDG&E's SM 2.0 proposal "complies with applicable statutory, regulatory, and Commission requirements," which arguably covers compliance with existing requirements related to CCA data access to meter interval data, but it is clear that the Commission inquiry related to CCA access stops at whether the SM 2.0 proposal complies with applicable laws and *existing* Commission directives related to CCA data access. Proposals to revise the existing CCA data access rules are plainly not within scope. As noted above, SDG&E SM 2.0 proposal does not modify *in any way* the existing meter data delivery process, which was agreed to with the CCAs and implemented in 2023. Thus, the attempt here by Mr. Utouh and Ms. McGee to define a standard for data access that exists neither in statute, nor any Commission decision, is improper and should be soundly rejected.

2. Proposals for New Data Access Requirements to Support Supply-Side Activities Lack Evidentiary Support and are Outside the Scope of this Proceeding

Mr. Utouh and Ms. McGee contend that the CCAs must have aggregated interval meter data access "at parity" with that of SDG&E – specifically, at "10 AM the morning after power flow."[138] With this information, they claim, SDCP and CEA could improve the efficiency of their energy procurement activities and reduce costs. The proposal presented by Mr. Utouh and Ms. McGee must be rejected for several reasons.

First, the claim that achieving "parity" with SDG&E's Energy Supply function, which handles energy procurement activities on behalf of SDG&E's bundled service customers, requires delivery of meter interval data at 10 a.m. the morning after power flow is incorrect. SDG&E's Energy Procurement department does not receive this data prior to its availability in the CCA Data Lake. Additionally, the assertion that SDG&E has an "unfair competitive advantage" over CCAs "in violation of California law" is unsupported and rests on a misreading of the CCA Code of Conduct found in D.12-12-036. The claim by Mr. Utouh and Ms. McGee that "[SDG&E's Energy Supply & Dispatch group] is the same "independent marketing division" referenced in the CCA-IOU Code of Conduct" [139] is incorrect. D.12-12-036 expressly

[138] Utouh/McGee Direct at 44.

[139] *Id.* at 48.

defines the "independent marketing division" as a separate, shareholder-funded division through which a utility may elect to market or lobby against CCAs, and requires that division to be functionally and physically separate from the utility's ratepayer-funded operations.[140] Thus, the testimony's characterization of SDG&E's ordinary energy procurement function as the "independent marketing division," and the legal conclusion it draws from that characterization, are demonstrably false based on a plain reading of D.12-12-036 and the Code of Conduct rules found therein.

Second, Mr. Utouh and Ms. McGee offer only speculation and present no credible evidence to support their contention that earlier access to customer meter interval data and the ability to "re-run dispatch optimization each morning, or on a more frequent basis" would result in measurable cost savings.[141] They provide no analysis to quantify the purported improvement in their electric procurement activities or related cost savings that data access at an earlier point would provide. For example, Mr. Utouh and Ms. McGee could have performed an analysis using historical information to demonstrate that earlier access to meter interval data would have altered their procurement decisions and resulted in cost savings. However, they provide neither this analysis, nor *any* analysis demonstrating the validity of their conclusion regarding the benefit of earlier access to customer data.

Third, as support for their assertion that the current data delivery process is insufficient, Mr. Utouh and Ms. McGee point to the R.22-07-005, Track B Working Group Report (Track B Report) and indicate that the Track B Report "specifically agreed with" the conclusion that the data delivery construct approved in AL 4288-E significantly reduces day-ahead load forecasting accuracy:

> The R.22-07-005 Track B Working Group Report specifically agreed with this, noting that data delay "[p]revents CCAs from timely tracking of load correlation from [real-time pricing ("RTP")]" and "[h]ampers load forecasting ([Estimated Settlement Quality Meter Data ("ESQMD")] and Day ahead load forecast submissions to CAISO) to promote load management/grid reliability").[142]

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[140] *Id.* at 12-14; D.12-12-036 at Attachment 1 at A1-2 to A1-3.

[141] Utouh/McGee Direct at 45 (citing R.22-07-005, *Track B Working Group Report, Appendix 2 Working Group Information* (Oct. 11, 2023) at 630).

[142] *Id*.

However, in asserting that the Track B Working Group Report "specifically agreed with" the positions taken by SDCP/CEA in this proceeding, Mr. Utouh and Ms. McGee mischaracterize the nature of the statements they quote from the Track B Report. The conclusions cited by Mr. Utouh and Ms. McGee appear in a March 2023 PowerPoint presentation co-sponsored by Mr. Utouh, and other CCA representatives including the California Community Choice Association (CalCCA), Marin Clean Energy, and Clean Power Alliance, which is attached in an Appendix to the Track B Report.[143] In other words, the statements Mr. Utouh and Ms. McGee refer to were statements offered *solely* by CCA parties in their working group presentation. Thus, the suggestion by Mr. Utouh and Ms. McGee that the views expressed by the CCAs reflected the consensus position of the *entire* Track B Working Group is misleading and improper.

Moreover, contrary to the suggestion by Mr. Utouh and Ms. McGee, the Track B Report Appendix material actually *supports* the conclusion that the current data delivery process affords reasonable and adequate access to meter interval data. The PowerPoint presentation co-sponsored by Mr. Utouh in 2023 defines the concern regarding SDG&E's data delivery process as: "Hourly interval data not provided to CCAs until close of billing cycle (29-31 days after power flow)." It defines the solution to this issue as: "CPUC should require, and allocate funding to develop, systems/processes to provide hourly/sub-hourly billing quality data with minimal latency to CCAs (within two days or less after power flow)."[144] This proposed solution is precisely what SDG&E sought to implement six months later in AL 4288-E, in cooperation with SDCP and CEA. Thus, the suggestion by Mr. Utouh and Ms. McGee that the rationale *supporting* implementation of the CCA Data Lake, as described in AL 4288-E, instead demonstrates its purported deficiencies is disingenuous.

Fourth, the reference by Mr. Utouh and Ms. McGee to the January 13, 2021 Root Cause Analysis co-developed by the Commission, the CAISO and the California Energy Commission (CEC) to study the August 2020 blackouts in California is misguided. To support their claim that CCAs must have access to meter interval data sooner than is provided for under the current data delivery process, Mr. Utouh and Ms. McGee point to the Root Cause Analysis, which they

[143] The relevant portion of the Track B Report is attached hereto as Appendix C.

[144] Appendix C at p. 630.

claim found that "'data quality and availability' was a contributor to underscheduling the power supply."[145] They suggest, in other words, that the Root Cause Analysis found that if usage information had been available to LSEs at an earlier point, the load forecast might have been more accurate and reliability issues might have been avoided. This is not what the Root Cause Analysis found; rather, the Root Cause Analysis noted that higher quality usage data is *not* immediately available and that "[d]ata available at an earlier time frame is much less accurate and sometimes incomplete":

> Data quality and availability - Load forecasts rely on actual load information. LSEs rely on different sources with different timelines to acquire historical usage information. Although smart meter data is available to some extent and under certain conditions, LSEs largely rely on metered data to obtain higher quality usage data, which is available only two months after the trade date. **Data available at an earlier time frame is much less accurate and sometimes incomplete**.[146]

Thus, the Root Cause Analysis does not support the notion that CCAs must have access to meter interval data sooner than is provided for under the current data delivery process.

Finally, as discussed above, the proposal by Mr. Utouh and Ms. McGee to revise the existing CCA data access rules is clearly not within scope. The Commission's consideration of CCA data access issues focuses on whether the SM 2.0 proposal complies with applicable laws and existing Commission directives related to CCA data access. As noted above, SDG&E SM 2.0 proposal does not seek to amend the existing meter data delivery process agreed to with the CCAs and implemented in 2023.

3. Proposals for New Data Access Requirements to Support Demand-Side Activities are Under Active Consideration in Another Commission Proceeding and are Outside the Scope of this Proceeding

In A.26-02-001, the Commission is considering SDG&E's application for approval of its demand flexibility (DF) rates, which were filed to comply with directives adopted by the Commission in D.25-08-049. The scoping memo adopted in that proceeding includes data access issues such as those related to "demand-side" activities raised by Mr. Utouh and Ms. McGee here:

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[145] Utouh/McGee Direct at 45.

[146] CPUC/CAISO/CEC, *Root Cause Analysis: Mid-August 2020 Extreme Heat Wave* (Januray 13, 2021) at 119 (emphasis added), *available at*: https://www.caiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf.

When, and how frequently, should SDG&E share data with Load Serving Entities such as Direct Access providers and Community Choice Aggregators, to broaden the knowledge of how all customers could participate in, and/or benefit from, SDG&E's proposed Demand Flexibility rates?[147]

Mr. Utouh and Ms. McGee readily admit that the issues regarding data access in the context of "demand-side" programs are before the Commission in A.26-02-001. They acknowledge that "in the pending demand flexibility proceeding in A.26-02-001, **the Commission scoped the CCA data access issues into that docket**."[148] They note further that SDCP/CEA have "discussed extensively" in their protest and direct testimony in that proceeding the concern that key data access pathways needed to support its demand flexibility proposal are lacking and that "[w]ithout sufficient data access for customers and LSEs, neither SDG&E nor the SD CCAs will be able to optimally calculate comparable demand flexibility rates or conduct essential customer outreach related to implementation of such rates."[149] In addition, Mr. Utouh and Ms. McGee attach several data request responses provided by SDG&E in A.26-02-001 to their testimony.

In contrast, the scoping memo issued in this proceeding makes *no mention* of CCA data access issues whatsoever. As discussed above, it asks only whether the proposed SM 2.0 project will provide near real-time access to customers and authorized third parties with customer consent.[150] Thus, given that the CCA data access issues related to "demand-side" programs are being actively considered in A.26-02-001 and are not before the Commission in this case, the Commission should decline to consider the CCA data access proposals offered by Mr. Utouh and Ms. McGee here.

4. The Proposal to Provide CCA Data Access Through a Customer-Facing Data Access Pathway Should be Rejected

Mr. Utouh and Ms. McGee propose that in addition to adopting their proposal to modify the rules related to CCA access to meter interval data under the Section 366.2(c)(9) process, the Commission should also require real-time data access for CCAs through the Customer Insights: Real-Time Energy Monitoring NextGen capability. They further suggest that SDG&E be

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147 A.26-02-001, *Assigned Commissioner's Scoping Memo and Ruling* (April 30, 2026) at 3.

148 Utouh/McGee Direct at 44.

149 *Id.* at 19.

150 Scoping Memo at 5.

required to "pre-program its SM 2.0 meters to enable the SD CCAs to access near real-time data access for applicable CCA customers who opt into the real-time data insights."[151]

As a threshold matter, it is not clear that the proposal to circumvent the customer consent process and "pre-program" SM 2.0 meters to provide CCAs with access to customer meter data is permissible under the Commission's rules. More to the point, this proposal is outside the scope of this proceeding and, in any event, makes little sense and, thus, should be rejected by the Commission. The Customer Insights: Real-Time Energy Monitoring NextGen capability is a customer-facing, opt-in capability intended to provide residential customers with near-real-time information about their own usage. CCA access to interval and billing data supports different regulatory and operational functions and is governed by statute, as well as by Rule 27, Schedule CCA-INFO, and existing delivery processes. The fact that a customer-facing capability does not operate as a CCA operational feed under SDG&E's SM 2.0 proposal does not establish that the SM 2.0 proposal is unreasonable or noncompliant with existing law or Commission directives.

5. Proposals for New Data Access Requirements Pertaining to Non-Consumption Data are Outside the Scope of this Proceeding

Mr. Utouh and Ms. McGee propose that SDG&E be required to provide access to non-consumption data generated by SM 2.0 meters, which they claim could be "useful" to CCAs. They provide scant detail regarding how such data, which relates to distribution operations, would be used by CCAs.[152] Mission:data witness, Brian Walsh, similarly identifies non-consumption information that could potentially be transmitted through customer-authorized data-access pathways, including voltage, power factor, frequency, reactive power, and rate information. Mr. Walsh's testimony focuses on information that could be made available to customers or customer-authorized recipients.[153]

This proposal by Mr. Utouh, Ms. McGee, and Mr. Walsh should be rejected. The proposal would greatly expand the data access requirements currently in existence and, thus, is outside the scope of this proceeding. Moreover, Mr. Utouh, Ms. McGee, and Mr. Walsh fail to make the case that it is reasonable to provide this data to CCAs. Much of the requested

[151] Utouh/McGee Direct at 57.

[152] *Id.* at 64.

[153] Mission:data, Prepared Direct Testimony of Brian James Walsh (September 25, 2026) (Walsh Direct).

information is associated with specific distribution functions. For example, voltage measurements, the distribution network and GIS model, feeder and secondary topology, and transformer asset attributes may be used in developing or improving transformer-to-meter mapping. Aggregated transformer-level load and capacity conditions, transformer asset-stress indicators, and forecasted transformer-level constraints are categories of grid-condition information. Outage "last-gasp" and restoration notifications are event-based operational signals used for outage detection, dispatch, and restoration. Voltage-anomaly information, waveform measurements, transformer health and loading, meter-to-transformer mapping, phase identification, and related data may support situational awareness, fault detection, power-quality monitoring, infrastructure management, safety, and other distribution-system functions.

Electric Grid Operations and Residential Customer Energy Consumption Data are entirely separate categories of data; these operational datasets are not interchangeable with a customer's own usage information and are not subject to the same processing, intended uses, or disclosure considerations. Operational information may concern utility assets, system configuration, outage operations, infrastructure conditions, other customers, reliability, safety, and cybersecurity. Each requested dataset must therefore be evaluated separately based on the authorized use; demonstrated necessity; sensitivity and security classification; whether aggregation, masking, delay, geographic limitation, or other safeguards could satisfy the need; operational, reliability, safety, privacy, and cybersecurity consequences; delivery method, frequency, and granularity; implementation and support costs; and responsibility for those costs.

As the Commission has recognized, the IOUs and CCAs perform different functions;[154] SDG&E remains responsible for distribution and transmission service, metering, billing, outage and emergency inquiries, public safety, reliability, and distribution system operations, while SDCP and CEA are responsible for procuring electric commodity supply on behalf of their customers and satisfying applicable scheduling and LSE obligations. Differing responsibilities appropriately require different operational systems, validation processes, interfaces, and timing. SDG&E does not agree that CCAs have a blanket entitlement to every operational dataset or interface used by SDG&E; rather, CCAs must make the reasonableness showing articulated in

[154] *See, e.g.*, D.04-12-046; D.05-12-041.

D.19-07-004. In any event, the issue is clearly outside the scope of this proceeding and should be rejected on that basis.

6. Delays in Interval Meter Delivery

In their joint testimony, Mr. Utouh and Ms. McGee raise concerns regarding delays in delivery of interval metering data through the CCA Data Lake. As explained above, the existing data delivery process includes multiple stages: Meter information is collected through the HES and processed through the MDMS, where applicable validation, estimation, and editing occur. The information then passes to the CIS for additional processing, including associating the information with the appropriate customer and CCA, formatting it for the applicable CCA delivery process, and performing additional estimation for certain complex metering configurations. The resulting information is made available through existing CCA mechanisms, including the CCA Data Lake and billing-related processes. These steps support data quality, billing, and settlement and explain why the timing of when information first appears in an SDG&E system may differ from the time a processed data product is available externally. When SDG&E established the CCA Data Lake in 2023, it was agreed that customer usage data would be made available to CCAs within two to three days after power flow; SDG&E's objective was to provide the data approximately two days after power flow, generally within 26 to 50 hours.

In response to the concern raised by Mr. Utouh and Ms. McGee, SDG&E has investigated the issue and has identified a timing configuration issue affecting the population of data into the CCA Data Lake. Specifically, the data load process was operating on Coordinated Universal Time (UTC) rather than Pacific Time. As a result, approximately 17 hours of data were loaded during each daily cycle instead of the intended 24 hours, causing certain records to be delivered as much as 72 hours after power flow. Although data delivery remained within the originally agreed two to three day timeframe described in AL 4288-E, SDG&E will work with the CCAs on corrective actions to align the data load process with its intended design and improve the consistency and timeliness of data availability.

While SDG&E provides this information here to address the concerns raised by Mr. Utouh and Ms. McGee in testimony, SDG&E submits that matters of this nature are appropriately addressed through the established operational processes described above.

VII. DIRECT DATA UPLOAD AND LOCAL REAL-TIME ACCESS

A. Background

Mission:data recommends that, if the Commission grants SDG&E's application it should require SDG&E to deploy "from day one" what it calls Direct Data Upload (DDU) and Local Real-Time Access (LRA) on all Smart Meter 2.0 meters.[155] At the same time, Mr. Murray acknowledges that the applicable communications standard should be selected in a later proceeding after briefing from interested parties.[156] These recommendations would therefore require SDG&E to commit to implementation *before* the governing technical framework has been developed and adopted. As discussed below, DDU and LRA remain immature architectures that have not been demonstrated to address an established need, nor have they been developed into an encompassing standard in California, also called an application profile, suitable for utility deployment. SDG&E's proposed Smart Meter 2.0 platform, by contrast, can proceed without foreclosing the Commission's consideration of future interoperability standards, if and when such standards mature and warrant implementation.

B. There Exists No Demonstrated Need for DDU or LRA

The record in this proceeding does not establish a demonstrated market, customer, or regulatory need for DDU or LRA as proposed by the direct testimonies of Michael Murray and Brian Walsh. While Mission:data's witnesses describe potential applications and benefits of these concepts, neither witness presents a market study, cost-benefit analysis, or quantitative evaluation demonstrating that either DDU or LRA are required to satisfy an unmet need. Neither discuss the estimated costs of such offerings with any detail that could be measured against any demonstrated market. Instead, the testimony largely assumes that broader access to real-time data is desirable and proceeds directly to advocating implementation approaches. For example, Mr. Walsh states that the purpose of his testimony is "to demonstrate the technical feasibility of customer data access capabilities,"[157] and that he "evaluate[s] the available methods of data access and discuss[es] the advantages and limitations of each."[158] Similarly, he concludes that

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[155] Murray Direct at 28.

[156] *Id.* at 34.

[157] Walsh Direct at 2.

[158] *Id*.

DDU and LRA "can be feasibly deployed in a manner that is both technically sound and consumer-friendly."[159] **These statements speak to feasibility, but neither necessity nor costs while also presenting DDU and LRA as presumptive endpoints rather than candidates within a broader standards-development process.**

Mission:data's proposed DDU design also prescribes specific transmission cadences, complementary use of DDU and Green Button Connect, a preferred JSON format, ISO 8601 timestamps, and publication of technical interface and security documentation. Those details are not ministerial implementation choices. They are components of the application profile, data model, security profile, versioning rules, and operating framework that have not yet been developed or adopted. The record does not establish that the proposed cadences, formats, documentation obligations, or dual-service model are necessary, interoperable, or cost-effective for SDG&E's deployment.

Notably, the testimony identifies a variety of hypothetical future uses for real-time data. Mr. Murray states that "digital energy management services" "smart thermostats, EV chargers, water heaters", and other "'smart' devices or appliances" could benefit from granular real-time information,[160] while Mr. Walsh describes potential use cases including "solar monitoring or demand response platforms", "home energy management systems (HEMS)", and other services.[161] However, neither witness quantifies expected participation levels, anticipated benefits, costs, or system impacts. The record therefore does not establish whether these concepts would produce benefits commensurate with the costs. In fact, many residential smart devices today connected to Wi-Fi (including thermostats, etc.) do not utilize real-time data. The vendors themselves weigh the costs of collecting and parsing real time data and then seek commensurate benefits to have a viable business model.[162]

Moreover, while the regulatory authorities cited by the intervenor testimony support customer access to usage data, neither the cited authorities nor the intervenor testimony establishes that DDU or LRA are the most effective or efficient means of providing that access.

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[159] *Id*. at 15.

[160] Murray Direct at 9, 16, 23.

[161] Walsh Direct at 2, 3.

[162] Commercial customers may choose to use KYZ functionality instead of real time data as discussed earlier.

The testimony argues that these concepts would advance customer choice and competition, yet it does not demonstrate that alternative mechanisms are incapable of satisfying the same applicable regulatory objectives. Mr. Murray himself recommends that "the Commission should decide in a future proceeding which technical standard SDG&E shall deploy."[163]

C. DDU and LRA are Immature Architectures

Brian Walsh describes LRA as an interface through which customer-owned devices and energy management systems would obtain real-time data from the meter:

> I recommend the Commission require SDG&E to offer LRA for all AMI meters. The meter streams high-frequency usage data – typically 1-second intervals – locally over a home's Wi-Fi network directly to a physical, on-premises receiving device – *e.g*. a smart thermostat, home energy management system hub or smart EV charger.[164]

This description reflects a mature and fully realized ecosystem in which meter interfaces, onboarding procedures, authorization methodologies, communications protocols, security requirements, data models, and certification processes have already been standardized and broadly adopted by appliance manufacturers, home energy management system vendors, and utilities. No such application profile currently exists for either DDU or LRA.

In contrast, Mr. Murray expressly acknowledges that the communications standard be selected in a later proceeding, after stakeholder participation.

> While it is the Commission's responsibility at some point to decide upon a communications standard, that decision should be made in a later proceeding after briefing from all parties. At this stage, it is reasonable to avoid locking in one communication standard for the life of the meters.[165]

SDG&E agrees that sequence should be preserved. The relevant stakeholders should first be permitted to evaluate the applicable use cases, architectures, technical requirements, and available alternatives for use in California, under California's policies, without being constrained by a predetermined implementation outcome. Following completion of an open standards-development process, the resulting application profile may be presented to the Commission for consideration and, if adopted, subsequent utility implementation.

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[163] Murray Direct at 29.

[164] Walsh Direct at 12.

[165] Murray Direct at 34.

The development of previous utility interoperability profiles demonstrates the importance of a collaborative standards-development process. The Zigbee Smart Energy Profile ("SEP") was initiated through the Zigbee Alliance (now the Connectivity Standards Alliance) and subsequently developed through participation by organizations representing smart metering and AMI infrastructure, customer energy management services, and semiconductor and communications technologies, including Itron, Elster, Trilliant Networks, Cellnet+Hunt, Tendril, Texas Instruments, Ember, and Freescale Semiconductor.[166]

Similarly, Green Button's automated data-exchange framework has roots in standards-development work conducted through the UCAIug OpenSG OpenADE Task Force. OpenADE was an industry-led initiative that developed functional and technical requirements for interoperable exchanges among utilities, customers, and third-party energy-usage-data service providers. Contributors to the OpenADE System Requirements Specification included representatives from utilities, including SDG&E, technology companies, utility and metering solution providers, consumer advocacy organizations, and other industry participants. NAESB subsequently established Model Business Practices for the Energy Services Provider Interface, which provides a standardized interface for customer-authorized exchanges of energy usage information between data custodians and authorized third parties.

These examples illustrate that successful interoperability profiles are typically not developed unilaterally. Rather, they emerge through multi-party collaboration involving utilities, technology providers, manufacturers, standards organizations, and other stakeholders. Broad adoption depends upon technical consensus, stakeholder acceptance, a sustainable governance framework, and the development of certification and interoperability testing programs that provide confidence that independently developed implementations will operate securely and consistently in practice.

Once a demonstrated market, customer, utility, or regulatory need for DDU, LRA, and/or other determined standard(s) has been established, and the respective, broadly accepted application profiles have been developed through appropriate stakeholder processes and are ready for Commission consideration, it would be appropriate to evaluate utility implementation through a subsequent Commission proceeding. That process would allow the Commission to

[166] Jack Shandle, "Zigbee Alliance Completes Smart Energy Profile," EE Times, Jan. 24, 2008. (available at: https://www.eetimes.com/zigbee-alliance-completes-smart-energy-profile/).

consider the proposed application profile, determine whether implementation is reasonable and in the public interest, establish the applicable requirements, and authorize an appropriate mechanism for the utility to recover prudently incurred implementation and ongoing costs. It would not be prudent to defer the utility's SM 2.0 deployment or have expectation that such a framework can be implemented through this application proceeding.

The record likewise does not establish the project-specific performance assumptions underlying Mission:data's recommendations. Assertions that DDU messages would be only 1-5 KB, that customer broadband would eliminate material AMI-network effects, or that Wi-Fi and rate limiting would reliably support one-second access across the proposed meter population depend on the final payload, protocol, session behavior, device population, logging, update traffic, error handling, and implementation architecture. These assertions should not substitute for vendor-specific design information, capacity testing, and a complete operational assessment. If a separate Commission proceeding is created for data access, these topics should also be covered.

D. Governance Must Precede Implementation

UCAN witness, Mr. Golding, proposes a Commission-created Technology Advisory Panel (TAP) with specified membership, timing, and recurring review responsibilities.[167] SDG&E does not oppose a non-binding advisory forum focused on SM 2.0 deployment and implementation, including rollout coordination and review of grid-edge efforts approved in this proceeding. However, neither this proceeding nor the proposed TAP is an appropriate forum for determining whether additional data-sharing alternatives or similar capabilities should be implemented. Those alternatives raise issues that extend beyond SDG&E's SM 2.0 deployment, including customer-data-access policy, technical and interoperability standards, cybersecurity and privacy requirements, certification, governance, and cost recovery.

Accordingly, the Commission should not use this proceeding, or a TAP established as part of it, to make an implementation determination regarding additional data-sharing alternatives. First, device standards are generally developed by industry groups, as the Zigbee standard was initially. Other standards may be handled at the CEC as part of its codes and standards work and not by the CPUC. The CEC is currently looking broadly at interoperability

[167] Golding Direct at 115.

standards between devices and IOU systems.[168] If the Commission believes such capabilities have potential value that warrants further consideration, SDG&E recommends that it wait to consider such devices or processes further until the standards are set by the appropriate industry groups and/or other state agency.

The current statewide process has already allowed examination of expanded data policy and technical questions to be evaluated on their own merits, rather than presuming implementation of particular data-sharing solutions through an advisory process established for SDG&E's Smart Meter 2.0 deployment.[169] The Commission should first determine, through its separate statewide proceeding, whether additional data-sharing capabilities should be implemented to achieve specific objectives. Only after that determination should implementation obligations, if any, be established.

Alternatively, requiring SDG&E to implement DDU or LRA functionality now, before the underlying standards, governance, certification, and interoperability requirements have been established would result in a company specific implementation that would not align with the requirements of any future industry standard. This approach would impose costs on ratepayers to develop, deploy, maintain, and support functionality that could later require substantial redesign or complete replacement to achieve compliance with a subsequently adopted standard. Moreover, any third-party solutions developed to integrate with an interim SDG&E-specific implementation could face significant transition costs and prolonged compatibility issues if a different statewide or industry-standard framework is ultimately adopted. Rather than accelerating interoperability, this approach risks creating stranded investments and market fragmentation while providing no assurance that the resulting implementation would satisfy the needs of the interested parties.

E. AMI 2.0 Prepares for Future Flexibility

SDG&E is not proposing a platform that forecloses future interoperability standards. Importantly, the inclusion of the deployment-ready application as an optional customer program

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[168] CEC, *Notice of Commissioner Workshop on Interoperability*; Docket No. 24-FDAS-02 (Load Flexibility Policy & Planning), TN 272800 (docketed September 15, 2026), *available at*: https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=24-FDAS-02.

[169] R.22-11-013 initiated the Data Access Working Group in 2025 facilitated by the University of California, Los Angeles. *See* www.laregionalcollaborative.com/data-working-group.

for real-time energy insights does not limit the Commission's authority to consider and determine, in an appropriate future proceeding, whether alternative real-time data-access capabilities should be required.

On the contrary, SDG&E's proposed architecture is intended to support evolving industry standards and currently incorporates support for various technologies and established interoperability frameworks. Consequently, the proposed platform provides the very foundation upon which future application profiles may be implemented as they mature and gain industry acceptance.

The record does not support requiring DDU or LRA as day-one Smart Meter 2.0 functionality. While these concepts may warrant future consideration, key elements of their implementation remain unresolved. For example, Mr. Walsh acknowledges that "[t]he particular communications standard for LRA should be established by the Commission."[170] Accordingly, it would be premature to make DDU or LRA a condition of initial SM 2.0 deployment. Rather, SM 2.0 should proceed while the separate standards effort develops in parallel. As that effort matures and specific requirements are established, DDU, LRA, or similar approaches can be evaluated on a more developed record

F. Cybersecurity Review of DDU and LRA

The SM 2.0 scoping memo included direction on two sides of the issue relating to Cybersecurity and its role in real-time data access, including DDU and LRA.

The Scoping Memo expressly puts both sides of this issue before the Commission:

> 2.g: Whether SDG&E's SM 2.0 project will provide near real-time access to energy consumption or demand response in a usable electronic format (to both bundled and unbundled customers and authorized third parties with customer consent) in compliance with applicable law and Commission directives.[171]

> 2.h: Whether SDG&E's SM 2.0 project adequately addresses privacy, cybersecurity, a reasonable engineering plan for maintaining network integrity during transition, a legacy decommissioning plan, and third-party risk issues.[172]

Mission:data's overall testimony states that, in relation to DDU and LRA, "Data access through two methods – direct data upload and direct download from a smart meter to either an

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[170] Walsh Direct at 12.

[171] Scoping Memo at 5.

[172] *Id.*

Internet-based or local device of the customer's choice – is technically feasible, cost-effective, and presents minimal cybersecurity risk." And "DDU is technically feasible with SDG&E's proposed AMI 2.0 technology and can be implemented without introducing material cybersecurity risk."[173] In the response to the question "Does DDU functionality increase security risk?", Mr. Walsh responds:

> When properly implemented, no. DDU operates within the existing secure architecture of advanced meters and SDG&E's AMI 2.0 network. It does not require opening new ports or enabling inbound network connections, and meter firmware remains isolated from external networks.[174]
>
> DDU introduces a limited set of considerations, such as impersonating a valid endpoint, compromising an authorization token, intercepting data in transit, unauthorized access to system logs, or operational bugs. These risks are manageable with standard cybersecurity controls.[175]

Since Smart Meter 1.0 was deployed in 2011, the cybersecurity threat landscape has evolved significantly. What were once primarily isolated malware and opportunistic hacking threats have grown into a complex environment that includes sophisticated cybercriminal organizations, nation-state actors, supply chain attacks, ransomware campaigns, and the increasing use of artificial intelligence to automate and scale cyber threat activity.[176] [177] Critical infrastructure operators, including electric utilities, are now routinely identified as targets of foreign threat actors seeking to disrupt operations or gain unauthorized access to sensitive systems and data.[178] [179] In addition, utilities must now plan for emerging cybersecurity risks that

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[173] Walsh Direct at 2.

[174] *Id.* at 8.

[175] *Id.* at 9.

[176] Cybersecurity & Infrastructure Security Agency (CISA), *CISA Vulnerability Review Fiscal Years 2024 and 2025* (August 26, 2026) at 1, 19 – 20, *available at*: https://www.cisa.gov/resources-tools/resources/cisa-vulnerability-review.

[177] National Institute of Standards and Technology (NIST), *Cybersecurity Supply Chain Risk Management Practices for Systems and Organizations*, NIST SP 800-161 Rev. 1 (May 2022) (discussing cybersecurity risks arising from products and services within the supply chain), *available at:* https://csrc.nist.gov/pubs/sp/800/161/r1/upd1/final.

[178] *See supra* n. 178 at 17 – 21.

[179] CISA, *Nation-State Threats* (describing ongoing nation-state cyber threats targeting U.S. critical infrastructure), *available at*: www.cisa.gov/topics/cyber-threats-and-advisories/nation-state-cyber-actors.

were not widely recognized when SM 1.0 was implemented. One such risk is harvest-now, decrypt-later, as adversaries may collect encrypted data today with the intent of decrypting it in the future as quantum computing capabilities mature.[180] Because smart meter infrastructure is expected to remain in service for many years, it is important that the platform support cryptographic modernization and future NIST security standards. Modern AMI platforms are designed with greater cryptographic agility, stronger key management capabilities, and upgrade paths to address both current and emerging threats.[181] Consequently, SM 2.0 is not only a technology upgrade, but also an important investment in maintaining the long-term cybersecurity resilience of critical electric infrastructure.

Considering the evolving cybersecurity threat environment discussed above, DDU and LRA would extend the SM 2.0 environment beyond established utility-managed communications by creating new connections among SDG&E's edge-computing environment, customer-managed networks, customer-selected devices, and third-party services. Although these capabilities may ultimately be implemented securely, doing so requires defined cybersecurity requirements, independent validation, and ongoing governance sufficient to manage the resulting technical and operational risks throughout the life of the SM 2.0 platform. SDG&E's concern is therefore not whether DDU or LRA is technically feasible, but whether either capability should be required before the governing cybersecurity standards, validation processes, and governance framework have been established. This distinction is especially important because Mission:data proposes fleet-wide implementation while its witness, Brian Walsh, characterizes the associated cybersecurity risks as minimal.

The issue is not whether SDG&E broadly supports customer access to real-time usage data; the issue is the sequence in which the security requirements, validation, and capability deployment are established.

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[180] NIST, *PQC Migration: Mappings to Risk Framework Docs* (September 18, 2025) (describing "harvest now, decrypt later" attacks), *available at*: https://www.nist.gov/news-events/news/2025/09/new-draft-white-paper-pqc-migration-mappings-risk-framework-docs.

[181] NIST, *Crypto Agility* (describing the need to "replace and adapt cryptographic algorithms" as security requirements evolve), *available at*: https://csrc.nist.gov/projects/crypto-agility.

Mr. Walsh concludes:

> Data access through two methods – direct data upload and direct download from a smart meter to either an Internet-based or local device of the customer's choice – is technically feasible, cost-effective, and presents minimal cybersecurity risk.

He similarly states that DDU "can be implemented without introducing material cybersecurity risk" and later concludes that the cybersecurity risk associated with LRA "is minimal."[182]

The record does not support Mr. Walsh's conclusion that the cybersecurity risks associated with DDU and LRA are "minimal." Currently, no final DDU or LRA architecture has been designed, implemented, or subjected to a design-specific cybersecurity assessment against defined security requirements. Cybersecurity risk cannot reasonably be characterized as minimal based only on an immature description of a system whose architecture, trust boundaries, operating controls, certification requirements, and lifecycle processes remain undefined.

Indeed, Mr. Walsh acknowledges that Linux-based advanced meters may face "unauthorized access, malware, physical tampering, network-based attacks, weak default configurations, firmware update vulnerabilities, credential theft, and data privacy exposure." He separately identifies DDU-specific risks including "impersonating a valid endpoint, compromising an authorization token, intercepting data in transit, unauthorized access to system logs, or operational bugs."[183]

These acknowledged threats demonstrate why the security of DDU and LRA cannot be established merely by naming familiar control categories. For example, Mr. Walsh states that DDU "supports endpoint whitelisting, credential-based access, and encryption," and later lists allowlisting, certificates, tokens, encryption, log protection, testing, and bandwidth safeguards.[184]

Similarly, Mr. Murray recommends that SDG&E support "IEEE 2030.5, Matter, or EBUS" for real-time usage data over Wi-Fi, while stating that "[t]he Commission should decide in a future, state-wide proceeding which technical standard SDG&E shall deploy."[185]

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[182] Walsh Direct at 2, 14.

[183] *Id.* at 8, 9.

[184] *Id.* at 4, 9.

[185] Murray Direct at 5.

These controls may be elements of a secure design, but they do not themselves establish a defensible cybersecurity posture, nor does identifying several possible standards define a complete DDU or LRA security profile. The testimony does not define measurable requirements governing how the controls would be implemented, tested, maintained, audited, or applied consistently across meters, edge applications, utility systems, customer networks, third-party devices, and cloud services. A DDU or LRA security standard would need to convert those general control concepts into enforceable requirements.

1. Authentication and Token Security

Mr. Walsh describes a DDU process in which "[t]he meter validates the recipient using certificate-based or token-based authentication." He then proposes "[u]sing cryptographically signed, meter-specific tokens that expire and cannot be forged."[186]

The statement that such tokens "cannot be forged" reflects a security objective rather than a security property that can be assumed under all circumstances. In practice, security depends on the security of the entire trust ecosystem, including key generation and storage, cryptographic implementation, token issuance, validation logic, token binding, expiration, revocation, and protection of the systems authorized to create trusted credentials. The presence of a digital signature does not establish that the signing environment, keys, or validation processes cannot be compromised.

Security properties should therefore be stated as design objectives to be independently tested. A mature application profile would need to specify the authentication method, token format, permitted cryptographic algorithms, token lifetime, meter and recipient binding, key protection, revocation process, and expected behavior following credential compromise.

2. DDU Creates a New Interface and Trust Boundary

Mr. Murray states that DDU would create an external communication path. He indicates that the customer would direct SDG&E to transmit real-time usage data to a URL of the customer's choice and that the meter would then transmit usage data "every few seconds, 24x7, directly to the third party's cloud service using the customer's broadband connection."[187] That proposed functionality necessarily introduces an external endpoint, a customer-managed

[186] Walsh Direct at 5, 9.

[187] Murray Direct at 25, 26.

network, and a new trust relationship that must be included in the security architecture and risk assessment.

To the question, "Does DDU functionality increase security risk?", Mr. Walsh states:

> When properly implemented, DDU operates within the existing secure architecture of advanced meters and SDG&E's AMI 2.0 network. It does not require opening new ports or enabling inbound network connections, and meter firmware remains isolated from external networks.[188]

The qualification "when properly implemented" identifies the central issue rather than resolving it. No DDU standard presently defines what proper implementation requires.

DDU would require the edge-computing component to join the customer's Wi-Fi network and establish sessions with an external endpoint. That creates an additional network interface and trust boundary. Although the edge-computing component may initiate the connection, an outbound session is a bidirectional communication. The meter-side application must process certificates, protocol responses, errors, and other content returned by the cloud service. Because DDU and LRA connect utility-owned equipment to a customer-managed network, customers should separately authorize network access and data disclosure and be able to revoke access and remove stored credentials.

Any third-party provider supporting SDG&E's proposal would be subject to SDG&E's established Third-Party Risk Management (TPRM) program, which includes cybersecurity due diligence, security control validation, contractual cybersecurity requirements, and ongoing vendor oversight. As part of this process, SDG&E evaluates vendor cybersecurity posture through reviews of security documentation, independent assurance artifacts such as SOC 2 Type II reports, and other risk-based assessments. Higher-risk solutions may be subject to additional cybersecurity engineering review and control validation prior to implementation. Following onboarding, SDG&E maintains ongoing oversight through periodic reassessments, continuous monitoring activities, security ratings monitoring, and review of independent security testing where appropriate. These processes help ensure that third-party providers maintain security controls and risk management practices consistent with SDG&E's cybersecurity expectations.

A compromised cloud service recipient can supply malformed or malicious responses intended to exploit defects in certificate processing, protocol parsing, response handling, or the

[188] Walsh Direct at 8.

DDU application. DDU therefore introduces additional risks that must be assessed and managed against defined requirements.

3. A Compromised Recipient Is Capable of Affecting the Meter

Mr. Walsh acknowledges that an attacker who compromises a customer account could redirect meter data meant for the authorized cloud service to an unauthorized endpoint. He nevertheless concludes:

> In addition, even if a recipient's endpoint were compromised, it cannot send commands back to the meter or penetrate SDG&E's systems.

That conclusion presupposes strict one-way data-flow enforcement, correct parsing, effective application isolation, and defect-free implementation, none of which Mission:data has specified or demonstrated.

Any session initiated by the DDU edge-computing component necessarily carries some server-supplied information back to that edge-computing component, including certificates, protocol responses, redirect instructions, status messages, and error content. A hostile endpoint can intentionally manipulate those responses. Moreover, the edge-computing component must communicate with the meter to obtain or initiate the requested data stream, making the overall architecture more complex than a passive one-way output.

A security standard would therefore need to define and independently test one-way data-flow restrictions, permitted commands, response handling, interface isolation, malformed-message behavior, and the security boundary between the edge-computing environment and metrology or AMI functions. Mission:data's testimony does not describe that architecture or testing.

4. Mr. Walsh's Push-versus-Pull Reasoning Undercuts His LRA Recommendation

Mr. Walsh describes the differences of "push" vs "pull", observing that "[a] 'pull' model of communication is where the data recipient requests data from the meter. This often requires complex customer router configurations. In contrast, in a 'push' model, the meter initiates data transfer to the authorized recipient at defined intervals."[189] He then continues with an

[189] Walsh Direct at 6.

endorsement of the push model: "The 'push' model is recommended for DDU because it enhances security, reliability, scalability, and operational simplicity."[190]

For LRA, however, he recommends the opposite architecture: "[LRA is a] Pull. Local devices would request data from the meter."[191]

He then asserts:

> The pull method is secure because data moves only when explicitly requested by an authorized device. Each request is authenticated, encrypted, and logged, minimizing exposure and preserving system integrity.[192]

This reasoning fails to address the meter-side listening service required to receive those requests. Before determining whether a requesting device is authorized, the service must accept an attempted connection and process at least some network, TLS, and application-protocol content. That pre-authentication processing surface may be exposed to denial-of-service attacks and other forms of exploitation.

Authentication and encryption may protect an established session and the data exchanged within it. They do not, standing alone, protect the listening service from direct exploitation. Mr. Walsh's own testimony explains that a data push model enhances security therefore undercuts his conclusion that LRA's pull architecture is secure merely because completed requests would be authenticated, encrypted, and logged.

The choice between push and pull is a foundational architectural and cybersecurity decision. It should be resolved through a standards-development process based on defined use cases, trust boundaries, threat models, and security requirements, not selected differently for DDU and LRA without a complete comparative assessment.

5. LRA Introduces a Service on a Customer-Managed Network

Mr. Murray describes LRA as follows: "LRA allows customer-authorized devices to request real-time usage data directly from the meter over Wi-Fi. Since AMI 2.0 meters have Wi-Fi, they can be joined to the customer's broadband network." He further states that "[c]ustomer devices such as smart thermostats, EV chargers, or Wi-Fi-enabled water heaters can then request

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[190] *Id*.

[191] *Id.* at 13.

[192] *Id.* at 14.

usage data over the local network" and that LRA would use a protocol under which "any standards-compliant device could connect to the AMI 2.0 meter."[193]

The material cybersecurity concern is not the use of Wi-Fi by itself. It is the introduction of a request-and-response service on utility-owned equipment that must accept communications from devices operating on a customer-managed network. Such networks may include consumer devices, guest devices, and Internet-of-Things equipment outside the utility's administrative control, as well as potentially compromised systems that may have direct access to the edge-computing environment.

6. LRA Risk Is Not Confined to Customer Devices

Mr. Walsh states: "Risks are limited and manageable. They are confined to customer-chosen devices and what might happen after the usage data is received by the device. LRA does not affect utility systems or other customers." He further concludes that "[u]tility systems remain isolated and under SDG&E's control."[194]

These conclusions are not supported by the LRA concept as proposed. The meter is a utility-owned asset. Under LRA, a customer-selected device would communicate with the edge-computing component associated with that meter. Isolation between the LRA application, the edge-computing component, metrology functions, and AMI communications is therefore a logical security property that must be architected, implemented, and independently tested.

The risk is not limited to what happens to data after it reaches the customer device. It also includes the security of the listening service, protocol implementation, authentication mechanisms, enrollment process, authorization controls, device-revocation process, software isolation, logging, patching, and vulnerability-management processes.

Because the same or substantially similar LRA service and common software baseline could be deployed throughout the meter population, a common weakness could create a repeatable exposure across the fleet. That possibility directly contradicts the assertion that the risk necessarily remains confined to one customer-selected device and cannot affect utility systems or other customers.

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[193] Murray Direct at 25.

[194] Walsh Direct at 14.

7. Functional Validation Is Not Cybersecurity Assurance

Mr. Walsh recommends that third-party recipients "register, provide endpoint certificates, and undergo brief functional validation tests." He explains that this would include "HTTPS/TLS verification, credential checks and connectivity testing" and concludes that such measures would "ensure strong security without restricting customer choice."[195]

Mr. Murray would go further by limiting SDG&E's ability to evaluate service providers. He states that "SDG&E could demand that a service provider undergo an arduous cybersecurity evaluation, effectively becoming a vendor to SDG&E," which he characterizes as "extremely costly" and "anticompetitive."[196] The relevant distinction, however, is not between no review and an unnecessarily burdensome review. It is between a proportionate, standards-based assessment and a brief connectivity test that does not establish the recipient's cybersecurity posture.

Functional testing can establish that an endpoint presents a certificate, accepts credentials, and successfully communicates. It does not establish the security of the recipient's broader environment.

As described, the proposed validation does not evaluate whether a recipient maintains cybersecurity controls and operational practices appropriate for protecting customer data. Nor does the proposal establish independent assurance, incident management, or ongoing compliance mechanisms necessary to verify that those protections remain effective over time.

Connectivity testing is therefore not equivalent to cybersecurity assurance. A DDU standard should establish proportionate but enforceable security requirements for any recipient of meter-originated customer data, together with initial validation, continuing compliance obligations, incident reporting, and periodic reassessment. The applicable requirements should be objective, risk-based, and applied consistently

8. Cybersecurity Responsibility Does Not Simply Transfer at the Egress Boundary

Mr. Walsh states:

> SDG&E is responsible for securing data up to the point of exit from its systems and ensuring safe transmission across the egress boundary – ensuring endpoint

[195] *Id.* at 11.

[196] Murray Direct at 34.

authentication and encryption. Once data is delivered, responsibility shifts to the recipient for privacy management.[197]

Cybersecurity risk and accountability do not simply end when the transmission is completed. Under Mr. Walsh's proposal, SDG&E would participate in registering, validating, and allowlisting recipients. A defensible framework must therefore define recipient security obligations, breach notification, ongoing accountability, subcontractor requirements, revocation, and the utility's authority to respond when a recipient presents an unacceptable risk. The proposed framework must also establish where recipient-held data may be stored, which downstream parties may access it, or which specific California privacy and Commission requirements govern those activities.

Any applications operating in or interacting with the edge-computing environment would also need to be integrated, or comply with SDG&E's established cyber-event management processes. The applicable security profile should define responsibilities and procedures for detection, investigation, containment, notification, recovery, and corrective action, including SDG&E's authority to suspend, isolate, or remove a compromised application, device, or recipient. These procedures are particularly important where the same application or software component may be deployed across a substantial portion of the meter fleet, because a common vulnerability could create a repeatable exposure rather than an issue confined to a single meter.

This does not mean that SDG&E must assume responsibility for every action of an independent recipient. It means that the ecosystem must include enforceable requirements so that customer data receives consistent protection after delivery and so that recipients remain accountable for the conditions under which they were authorized.

Mr. Murray's proposed prohibition on SDG&E imposing "any terms or conditions on in-home devices or competitive service providers that use real-time usage data over Wi-Fi" would make those continuing obligations difficult to establish and enforce.[198] A customer's authorization to share data is not a substitute for defined recipient obligations concerning security, incident notification, remediation, and revocation.

[197] Walsh Direct at 10, 11.

[198] Murray Direct at 29.

9. An Undefined Standard Cannot Support Manufacturer Self-Certification

Mr. Walsh recommends that "the Commission require SDG&E to offer LRA for all AMI meters." In the same answer, however, he states that "[t]he particular communications standard for LRA should be established by the Commission," and further proposes that "SDG&E should publish a compliance checklist for device manufacturers to self-certify against," while avoiding "extra fees, delays, or contractual constraints."[199]

This recommendation would mandate the capability before its protocol and security requirements have been selected. A capability cannot be evaluated or secured before it has been sufficiently defined.

Mr. Murray confirms that the governing standard has not been selected. He states that "[t]he Commission should decide in a future, state-wide proceeding which technical standard SDG&E shall deploy."[200] Requiring "[e]nablement of DDU and LRA over Wi-Fi for all AMI 2.0 meters, not a subset, from day one"[201] while deferring selection of the governing standard, would reverse the appropriate sequence of architecture, threat modeling, standards development, validation, and deployment.

However, first it is worth noting that the Commission does not establish technical standards. In the past, the IOUs collaborated with industry participants and manufacturers to establish the Smart Energy Profile used for Zigbee with considerable negotiation and documentation.

Second, manufacturer self-certification would not provide independent evidence that a device or implementation satisfies the applicable interoperability and security requirements; any manufacturer may attest compliance without comprehensive testing. By contrast, California's own DER interconnection framework relies on an industry-defined protocol profile with conformance testing rather than self-attestation. California Rule 21 requires applicable distributed energy resources within investor-owned utility territories to use IEEE 2030.5-2018 as described in the SunSpec Common Smart Inverter Profile, with SunSpec certification testing

[199] Walsh Direct at 12.

[200] Murray Direct at 5.

[201] *Id.* at 28.

performed by authorized test laboratories.[202] A checklist cannot substitute for a defined application profile, security profile, conformance test suite, independent testing process, certification authority, vulnerability-handling process, and lifecycle obligations. Also, removing contractual constraints weakens SDG&E's ability to impose security obligations, incident notification, and the right to disconnect a compromised device. The suggested checklist is also not consistent with the SM 1.0 HAN certification that was used and which worked well – it required manufacturers to abide by the IOUs' terms and conditions.

The Commission therefore should not require fleet-wide LRA implementation before an appropriate standards-development process has established the protocol, security architecture, conformance requirements, independent testing, and certification program. Self-certification is not an adequate substitute for independent verification.

10. Mission:data's Restrictions Would Impair Cybersecurity Risk Management

Mr. Murray asks the Commission to impose "[a] prohibition on imposing any terms or conditions on in-home devices or competitive service providers using real-time usage data over Wi-Fi."[203] He criticizes terms under which utilities reserve the ability to disconnect HAN devices[204] and raises the concern that "SDG&E could demand that a service provider undergo an arduous cybersecurity evaluation, effectively becoming a vendor to SDG&E. This would be extremely costly, anticompetitive, and would contravene long-established Commission policies."[205]

A categorical prohibition on terms and conditions would impair SDG&E's ability to impose minimum security requirements on devices and services that establish trusted communications with utility-owned equipment. It could also impair SDG&E's ability to require breach notification, direct remediation, suspend access, or disconnect a device or provider after

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[202] SunSpec Alliance, *2030.5 CSIP Specifications*, *available at* https://sunspec.org/ieee-2030-5-csip-certification/; PG&E, SDG&E, and SCE, *Instruction Sheet for Standards and Required Tests for Equipment to Be Certified for Interconnection under Rule 21* (Version June 5, 2025), *available at:* https://www.sce.com/sites/default/files/custom-files/PDF_Files/Rule_21_Testing_and_Certification_Instruction_Sheet_Final_2025-06-05.pdf.

[203] Murray Direct at 29.

[204] *Id.* at 33.

[205] *Id.* at 33, 34.

discovery of a significant vulnerability or suspected compromise. As stated above, there is also a precedent with SM 1.0 which did require manufacturers of devices connecting to the meters to agree to the IOUs' terms and conditions, and to sign a liability waiver.[206] The Commission did not prohibit these controls in that context.

Further, the suggestion that these controls are designed to thwart competition is inapposite. Any party whose device or service is permitted to communicate with utility infrastructure must be subject to proportionate, risk-based security requirements and to appropriate suspension or disconnection authority when necessary to protect customers and utility assets. More notably, the meters and meter system are the property of SDG&E. SDG&E must be able to retain the right to impose any necessary terms and conditions to ensure safe, reliable electrical service that could be hampered or interrupted if no such terms are imposed.

Customer authorization does not eliminate those responsibilities. A customer may authorize access to data, but that authorization does not establish that the selected device or provider is secure or eliminate the utility's obligation to manage risks to its own equipment and systems.

11. App-Store Governance Is a Cybersecurity Control

Mr. Murray states:

> Importantly, software developers need not be associated with SDG&E or Landis+Gyr. Experienced software developers can develop apps so that meters gain new functionalities over time without needing to physically replace the meters[207]

He recommends that the Commission "expressly disavow any approval of, or supervision over, SDG&E's App Store, including its terms, fees, functionality or operations," and further recommends that the Commission "clearly state that it will not supervise or regulate the App Store for SDG&E's AMI 2.0 meters."[208]

Applications installed in the edge-computing environment are executable code operating within a utility-managed ecosystem and adjacent to metrology and AMI communications functions. Decisions regarding who may publish code, how applications are evaluated, how

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[206] All HAN documentation can be found at www.sdge.com/residential/home-area-network-device-compatibility-validation.

[207] Murray Direct at 38.

[208] *Id.* at 39 - 41.

software provenance is established, and how code is deployed or removed are fundamental cybersecurity controls.

Any framework governing the SM 2.0 application ecosystem should therefore preserve security review, code signing, software provenance validation, application certification, sandbox testing, controlled deployment, monitoring, vulnerability response, and the authority to reject or remove applications that fail to meet established requirements. These controls protect against software-supply-chain compromise, unauthorized code deployment, insecure applications, and replication of a vulnerability across the meter fleet.

To preserve both cybersecurity and fair access, the application-security criteria should be published, objective, risk-based, and applied consistently.

An open and competitive application ecosystem cannot reasonably be equated with an ungoverned software-distribution channel.

12. Embedded Linux Does Not Establish a Secure Architecture

Mr. Walsh states that embedded Linux "provides stable hardware control, secure networking, and support for application software such as meter data collection and encryption."[209]

Embedded Linux can support networking and security functions, but it is not secure merely because it is Linux-based. Its security depends on configuration, enabled services, kernel and library versions, application isolation, credential protection, secure boot, software provenance, signed updates, vulnerability remediation, and maintenance throughout the meter lifecycle. Any applications operating in or interacting with the edge-computing environment would therefore create continuing patch- and vulnerability-management obligations. The present proposal does not define who would be responsible for identifying and remediating vulnerabilities, the applicable remediation timelines, how updates would be tested and deployed across the meter fleet, or how an application or destination service that is no longer maintained would be suspended or removed.

Updates also require regression testing to determine whether a security change adversely affects application behavior, interoperability, reliability, metrology, communications, or system performance. The use of embedded Linux may make DDU or LRA technically possible, but it

[209] Walsh Direct at 3.

also creates continuing patching, testing, software-supply-chain, and lifecycle-management obligations.

Without a defined security profile and an independent assessment demonstrating compliance with that profile, the use of embedded Linux does not establish that DDU or LRA can be securely deployed and maintained.

13. Conclusion on Cybersecurity review

SDG&E supports customer access to real-time usage data and does not contend that DDU or LRA can never be implemented securely. The narrower conclusion is that the present record does not define a complete architecture, a standards-based access profile, or an accepted application profile against which either capability can be assessed. Nor does it establish an independent certification process capable of demonstrating that participating devices and data recipients satisfy those requirements. Therefore, the facts do not support Mission:data's assertion that DDU and LRA present minimal cybersecurity risk.

If stakeholders wish to pursue DDU or LRA, cybersecurity must be integrated into a collaborative standards-development process that produces both the access profile the SM 2.0 meters must support and the corresponding security profile for its use. That process should define a comprehensive cybersecurity framework, including the technical, operational, and governance requirements necessary to securely operate DDU and LRA capabilities. It should also establish an independent certification process, define the conditions for granting access to certified devices and authorized data recipients, and publish objective App Store security criteria that apply consistently and without discrimination against participating applications. Once the applicable profiles and independent certification process are established, access should be enabled for certified devices and authorized data recipients that satisfy the defined requirements.

Until that work has occurred, requiring SDG&E to implement DDU or LRA would compel the Company to create a cybersecurity architecture specific to and valid only for SDG&E, without a consensus security standard, independent certification program, or established governance model. The more prudent course is to preserve the SM 2.0 platform's ability to support future standards while allowing any DDU or LRA application profile to be developed, independently validated, and adopted through an appropriate multi-stakeholder process. This approach gives customers a defined path to real-time data access without

mandating capabilities before the security requirements necessary to govern their implementation exist.

G. Conclusion

Mission:data has not made a compelling, evidence-based case that either the LRA or DDU functionality should be adopted by SDG&E. As provided in the details above, there is a chronology of developing standards, cybersecurity testing, as well as establishing other criteria that should take place before any IOU should or could consider adding this functionality. Moreover, Mission:data does not provide any evidence of customers asking for either of these offerings in California, nor do its witnesses discuss potential market studies, or other considerations that would be important to ensure ratepayer value. Mission:data also presents no evidence that there would be adequate benefits commensurate with solving the standards and cybersecurity issues discussed herein which could have some considerable cost attached. For all of these reasons, SDG&E urges the Commission to reject Mission:data's proposals until a robust record is developed that measures the costs of all these implementation issues against real benefits and known markets.

VIII. CONCLUSION

SDG&E respectfully requests that the Commission approve the Smart Meter 2.0 platform and Customer Insights NextGen capability as proposed by SDG&E and reject the intervenor proposals described herein. This approach advances near-term customer and grid benefits while protecting customer data, utility systems, reliability, and ratepayers and preserving flexibility for future Commission-authorized capabilities.

This concludes this rebuttal testimony.

IX. WITNESS QUALIFICATIONS FOR OMAR ZEVALLOS

My name is Omar Zevallos, and my business address is 8680 Balboa Avenue, San Diego, California 92123. I serve as the Director of Cybersecurity and Chief Information Security Officer (CISO) for SDG&E Enterprise Cybersecurity Technology. In this role, I am responsible for overseeing cybersecurity technology strategy and operations across SDG&E, SoCalGas, and the Corporate Center.

Prior to my current position, I held a range of leadership roles within the organization, including: Field Engineer; Operations and Engineering Manager for Electric Regional Operations; Manager of Energy Management Systems; Manager of Operational Technology (OT) Networks; Senior Group Product Manager; and Director of Network infrastructure. I am also a United States Navy veteran and a licensed Professional Engineer in the State of California. I received a Bachelor of Science degree in Electrical Engineering from San Diego State University and a Master of Science degree in Organizational Leadership from Norwich University. In addition, I hold a Chief Information Security Officer (CISO) certification from Carnegie Mellon University.

I have previously testified before the Commission.

APPENDIX A

Mission:data Responses 1 and 4 to SDG&E DR 001

3. Mission.data objects to Instructions Nos. 1 through 8 as unduly burdensome to the extent they impose a continuing or indefinite duty to update discovery responses, beyond Commission requirements To the extent the instructions suggest an obligation to provide real-time updates or to supplement each time new information becomes available, they are unreasonable, impractical, and beyond the scope of discovery obligations. Mission.data will, however, timely supplement responses if and when it learns that a prior response was materially incomplete or incorrect, consistent with applicable rules.

4 Mission.data objects to Instructions Nos 1 through 8 to the extent they purport to require the individual(s) responsible for providing the response and/or designate the proper witness to cross-examine concerning the response. The responses reflect Mission:data's response as a corporate entity to the requests and not the work of any one individual.

5 Mission.data objects to Instructions Nos 1 through 8 to the extent they purport to require verified responses.

PRELIMINARY STATEMENT

Mission·data's responses to the following data requests ("requests") are made to the best of its present knowledge, information, and belief Mission.data has not concluded its investigation of the facts related to this proceeding The following responses are, at all times, subject to such additional or different information as discovery or further investigation may disclose. Therefore, the following responses and objections are given without prejudice to the Mission:data's right to rely on subsequently discovered or recalled information and evidence. Mission·data specifically reserves the right to make use of, or to introduce at any hearing, information and/or documents responsive to the following requests that is discovered or recalled subsequent to the date of these responses, including, without limitation, any information or documents obtained in discovery or by further investigation of this matter.

REQUESTS & RESPONSES

REQUEST 1

Please refer to *Mission.data Coalition's Motion to Compel Discovery or in the Alternative Require Supplemental Testimony* (Motion) filed in A.25-12-012 on September 4, 2026. Mission data states at p. 4 "Mission:data is a not-for-profit social welfare organization with **members (primarily software and energy management companies)** interested in SDG&E's SM deployment." (Emphasis added).

a. Please provide a complete list of all current and past members of Mission:data Coalition (Mission data). Please indicate which members are current members of Mission:data

RESPONSE 1

Mission.data coalition objects to the request for all past members of Mission:data because that information is outside of the scope of this proceeding and is not reasonably calculated to lead to the discovery of admissible evidence

Mission.data objects to the request for "all" current members because compelling a list of members violates Mission.data's due process rights guaranteed by the Fourteenth Amendment to the United States Constitution (*see, e g , NAACP v Alabama*, 357 U S 449 (1958)) and because Mission·data's members have lawful private interests to associate freely with groups of their choosing, rights that are indispensable to the preservation of freedom of association.

Notwithstanding and without waiving the above objections, Mission·data responds as follows.

a. Mission data is a not-for-profit social welfare organization, and its list of current members that wish to be publicly listed is available on its website· https //www missiondata io/welcome#about

REQUEST 2

Please provide a current curriculum vitae or resume for each of the following designated reviewing representatives for Mission:data:

a Michael Murray
b. Katherine Wyszkowski
c Alicia Zaloga

RESPONSE 2

Mission:data objects to this request to the extent the phrase "reviewing representatives" is vague and does not provide Mission·data with specific enough information to respond For the sake of the below response, Mission:data presumes that "reviewing representative" refers to a "Reviewing Representative" or "Authorized Reviewer" as those terms are used in the Nondisclosure Agreement (NDA) Mission:data entered with SDG&E in this proceeding

Mission:data further objects to this request because this information is not reasonably calculated to lead to the discovery of admissible evidence To the extent SDG&E seeks this information related to these individuals' qualifications as a reviewing representative, the NDA provided SDG&E five business days after receiving notice to provide "a written objection to a specific Reviewing Representative stating the grounds for the objection." SDG&E did not provide such written objections for the above three individuals within that time period, so the requested information cannot be relevant to the listed individuals' qualifications as reviewing representatives

Furthermore, Ms. Zaloga is the legal assistant to Mission data's counsel in this case, and is explicitly included as a person to whom Protected Materials can be disclosed under the NDA in Paragraph 8(ii)

Notwithstanding and without waiving the above objections, Mission.data responds as follows.

See Attachments 1-2(a)—1-2(c).

REQUEST 3

b. Mission:data objects to this request to the extent it seeks information about experts who have not yet appeared in this proceeding. Mission·data further objects to this request as overly burdensome to the extent it asks for a "complete" list.

Notwithstanding and without waiving the above objection, Mission.data responds as follows·

i See response to 3(a) above

ii See response to 3(a) above

c Mission·data objects to this request to the extent it seeks information about experts who have not yet appeared in this proceeding Mission·data further objects to this request as overly burdensome to the extent it asks for a "complete" list.

Notwithstanding and without waiving the above objections, Mission:data responds as follows·

- Itron
- Landis+Gyr
- Aclara/GE
- Elster/Honeywell

REQUEST 4

Please refer to the Motion at p 8· "Whether the vendor is a reputable vendor, its reputation in the market, its experience and track record with regard to metering and technology integration in other jurisdictions, its ability to take on alternate ownership or financing structure obligations, the functionalities and past performance of the product SDG&E is proposing to purchase, the successful integration of meters **with customer-owned technologies** over Wi-Fi for the benefit of ratepayers and the terms of the agreement struck are matters that are critical to these Scoped Issues." (Emphasis added).

a Please describe the specific "customer-owned technologies" Mission·data refers to in this statement.
b. Please indicate which, if any, Mission.data members sell or otherwise offer any of the "customer-owned technologies" referenced in this statement.
c. Please describe "alternate ownership or financing structure obligations" Mission:data refers to in this statement.

RESPONSE 4

a. Mission.data is referring to behind-the-meter devices and appliances including, but not limited to, electric vehicle chargers, smart thermostats, Wi-Fi-connected electric water heaters, etc.

b. Mission:data objects to this request to the extent the information is publicly and equally available to SDG&E on its members' websites. Mission:data further objects to this request as overly burdensome to the extent it asks Mission:data to list all possible technologies that fall into that category Mission:data further objects to this request to the extent it is asking Mission·data to conduct new studies or analyses.

Notwithstanding and without waiving the above objections, Mission:data responds as follows.

Mission:data is a not-for profit social welfare organization and is not an industry association Please see Mission data's response to SDG&E DR 1 a for a list of Mission.data's members that wish to be publicly identified. While those members are not parties to this proceeding, many of those members offer information about their products or offerings publicly In addition, Mission:data is not aware of non-public information in its possession concerning members' technologies sold to customers or future planned technologies

Mission data's members are primarily software and energy management companies that offer innovative, consumer-facing products and services. Mission.data's members have developed software and technology tools that enable commercial and residential consumers to gain information about their energy use and better manage their use in order to save energy, reduce carbon emissions, and cut their costs. As such, Mission:data's members support Mission:data's guiding principles·

1 All consumers should have easy access to the best available information about their energy use (including both "backhaul" information through the utility website and real-time information directly from smart meters) and the ability to easily share that data with energy management service providers of their choice.
2 Energy consumption and pricing information should be provided in the best available format to support innovative new services (including machine-readable formats that are consistent nationwide and consistent with the best industry standards)

c. Mission:data objects to this request as overly burdensome and vague to the extent it is asking Mission:data to compile or list all possible obligations that smart vendors could enter into in a contract with SDG&E.

Notwithstanding and without waiving the above objection, Mission.data responds as follows·

APPENDIX B

Mission:data Response 10 to SDG&E DR 002

REQUEST 9

Please see Slide 19 of the Presentation describing the "Data Lifecycle " The first step of the lifecycle is described as "Collection" of data shared in the data collective. Do you agree that smart meters enable collection of data including, for example, energy usage, consumption patterns, and/or energy-related behaviors? If you disagree, please explain why you disagree.

RESPONSE 9

Mission.data objects to this request to the extent it assumes that Mission.data engages in any particular activity described in the Presentation because Mission:data is somehow a member of "the data collective" discussed in prior questions Mission·data further objects to this request to the extent the terms "energy-related behaviors" and "consumption patterns" are vague and do not provide Mission data with specific enough information to respond

Subject to and without waiving this objection, Mission data responds as follows·

Yes, smart meters enable the collection of energy usage data, which therefore also constitutes "consumption patterns" under the dictionary definitions of those terms. While "energy-related behaviors" is undefined, one could infer certain behaviors based on residential usage data Howevei, the accuracy and value of such inferences is highly debatable.

REQUEST 10

Please see the following excerpts from Mission.data's Protest filed in A.25-12-012 on January 21, 2026

- Page 5: "Mission:data is a not-for-profit social welfare organization with approximately twenty-five members Mission·data's members are primarily software and energy management companies that offer innovative, consumer-facing products and services."
- Page 2. ". . . there are nevertheless dozens of entities today that depend upon receiving accurate, timely, and complete interval usage data from SDG&E on an ongoing basis. Enterprise energy management software firms, home performance contractors, retail suppliers such as community choice aggregators, and many others represent a more mature set of industries and organizations than those which existed in 2007. Importantly, these firms require the steady flow of customer data from SDG&E because their products and services depend on it."
- Page 3. "Interruptions to such data flow, or the possibility of interruptions, represent a significant business risk to recipients of meter data."
- Page 3. "Private energy management firms have also been negatively affected by data-related interruptions in recent years."
- Page 3: "One entrepreneur developing load flexibility tools for commercial buildings in San Diego was forced to cease product development and marketing efforts when SDG&E discontinued its HAN features in 2024 Another firm that helps customeis track the operational status of rooftop solar arrays reported to us in 2023 that SDG&E experienced outages with its Green Button Connect system in November and December 2023." (Citations omitted)

- Page 3 "[A]n energy management entrepreneur reported to us that they abandoned the use of SDG&E's Green Button Connect altogether because SDG&E would not onboard them, despite diligent attempts made over the course of several years."
- Page 4. "The reality is that dozens of organizations now depend upon SDG&E to deliver meter and customer data electronically – and these organizations suffer economic consequences if SDG&E fails to deliver "
- Pages 4-5: " . . the data generated by advanced meters is not solely for use by customers, third parties, retail suppliers such as community choice aggregators, schools and institutions are affected by SDG&E's metering and software infrastructure decisions By representing many such data recipients, Mission:data's interests are directly affected by the technology decisions, operational controls, and system uptime parameters proposed in SDG&E's Application "

Please confirm or deny that Mission:data represents <u>each</u> of the following interests in this proceeding.

a. Economic, commercial, and/or competitive interests of its software and energy management company members?
b Economic, commercial, and/or competitive interests of "entities today that depend upon receiving accurate, timely, and complete interval usage data from SDG&E on an ongoing basis"?
c Economic, commercial, and/or competitive interests of "enterprise energy management software firms, home performance contractors, retail suppliers such as community choice aggregators, and many others"?
d Economic, commercial, and/or competitive interests of entities subject to potential "significant business risk" due to unavailability of meter data?
e. Economic, commercial, and/or competitive interests of private energy management firms subject to potential negative impacts related to data-related interruptions?
f Economic, commercial, and/or competitive interests of entrepreneur(s) developing load flexibility tools for commercial buildings in San Diego?
g. Economic, commercial, and/or competitive interests of firm(s) that help customers track the operational status of rooftop solar arrays?
h Economic, commercial, and/or competitive interests of "organizations [who] now depend upon SDG&E to deliver meter and customer data electronically"?
i. Economic, commercial, and/or competitive interests of "third party retail suppliers that are affected by SDG&E's metering and software infrastructure decisions"?

RESPONSE 10

Mission data objects to this request to the extent it is vague as to the use of "economic, commercial, and/or competitive interests" and does not provide Mission:data with specific enough information to respond

Subject to and without waiving the foregoing objection, Mission:data responds.

Mission:data is a not-for profit social welfare organization and is not an industry association

Mission:data's members are primarily software and energy management companies that offer innovative, consumer-facing products and services Mission·data's members have developed software and technology tools that enable commercial and residential consumers to gain information about their energy use and better manage their use in order to save energy, reduce carbon emissions, and cut their costs. As such, Mission·data's members support Mission·data's guiding principles·

1. All consumers should have easy access to the best available information about their energy use (including both "backhaul" information through the utility website and real-time information directly from smart meters) and the ability to easily share that data with energy management service providers of their choice
2 Energy consumption and pricing information should be provided in the best available format to support innovative new services (including machine-readable formats that are consistent nationwide and consistent with the best industry standards)

    a Mission·data's represents the interests of its software and energy management company members to the extent those interests align with the above guiding principles.
    b Mission:data's represents the interests of its members who are "entities today that depend upon receiving accurate, timely, and complete interval usage data from SDG&E on an ongoing basis" to the extent those interests align with the above guiding principles
    c Mission·data's represents the interests of its members who are "enterprise energy management software firms" to the extent those interests align with the above guiding principles.
    d Mission data's represents the interests of its members who are entities subject to potential "significant business risk" due to unavailability of meter data to the extent those interests align with the above guiding principles
    e. Mission.data's represents the interests of its members who are "private energy management firms subject to potential negative impacts related to data-related interruptions" to the extent those interests align with the above guiding principles
    f Mission·data's represents the interests of its members who are "entrepreneur(s) developing load flexibility tools for commercial buildings in San Diego" to the extent those interests align with the above guiding principles
    g Mission.data's represents the interests of its members who are "firm(s) that help customers track the operational status of rooftop solar arrays" to the extent those interests align with the above guiding principles
    h. Mission:data's represents the interests of its members who are "organizations [who] now depend upon SDG&E to deliver meter and customer data electronically" to the extent those interests align with the above guiding principles
    i. No.

REQUEST 11

Is Mission.data's interest in this proceeding ensuring that Mission.data is able to receive data directly from SDG&E?

APPENDIX C

R.22-07-005, *Track B Working Group Report, Appendix 2 Working Group Information* (Oct. 11, 2023), pp. 630-635

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

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Order Instituting Rulemaking to Advance Demand Flexibility Through Electric Rates.	Rulemaking 22-07-005

TRACK B WORKING GROUP REPORT AND NOTICE OF AVAILABILITY

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Dated: October 11, 2023

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE

STATE OF CALIFORNIA

Order Instituting Rulemaking to Advance Demand Flexibility Through Electric Rates.	Rulemaking 22-07-005

TRACK B WORKING GROUP REPORT AND NOTICE OF AVAILABILITY

Pursuant to Assigned Commissioner's Phase 1 Scoping Memo and Ruling, issued November 2, 2022, and the Administrative Law Judge Email Ruling Issued on September 29, 2023, Southern California Edison Company ("SCE") respectfully submits the Track B Working Group Report, which is attached hereto as Attachment A, on behalf of the Track B Working Groups.

Additionally, pursuant to Rule 1.9(d) of the California Public Utilities Commission ("Commission") Rules of Practice and Procedure, SCE hereby provides Notice of Availability of the following appendices in support of the Track B Working Group Report, which were concurrently filed with the Commission and posted on SCE's website today, October 11, 2023. These documents exceed the size threshold set forth in Rule 1.9(d)(1) and may be accessed electronically from SCE's website by going to the listed URLs, or by following the below steps:

APPENDIX 1 – PARTY PROPOSAL ATTACHMENTS	https://edisonintl.sharepoint.com/:b:/t/Public/regpublic/Eeq34SYT1jRMrcuBOM3709cBNdIe1T_Sg9eGGU6o2AAerA
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- Step 2 - Click "View and Search all CPUC Documents"
- Step 3 - Click "Proceeding #" column header
- Step 4 - Click "Filter By", type "**R.22-07-005**" into the Search box, and "Apply"

The above documents are presented in Adobe Acrobat (pdf) format and can be viewed online, printed, or saved to your hard drive. Requests for these documents may also be directed to the undersigned.

Respectfully submitted,

/s/Joel Mallord

By. Joel Mallord

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October 11, 2023

Attachment A

Track B Working Group Report

California Public Utilities Commission
Demand Flexibility OIR
Track B Working Group Report

October 11, 2023

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BEFORE THE PUBLIC UTILITIES COMMISSION OF THE

STATE OF CALIFORNIA

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Order Instituting Rulemaking to Advance Demand Flexibility Through Electric Rates.	Rulemaking 22-07-005

TRACK B WORKING GROUP REPORT

APPENDIX 2
WORKING GROUP INFORMATION

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CCA Barriers to Offering Dynamic Pricing to Unbundled Customers

Leanne Bober, CalCCA
Lucas Utouh, San Diego Clean Power
Justin Kudo, Marin Clean Energy
Karen Schmidt, Clean Power Alliance
Sabrinna Soldavini, Marin Clean Energy

Demand Flexibility
R.22-07-005
Track B, Working Group 2
March 24, 2023

Scoping Memo - Issue 4.b.

What systems and processes should the Commission authorize to enable load serving entities to offer unbundled customers the option to take service on dynamic electricity prices?

CCA Barriers to Offering Real Time Pricing (RTP)

➢ Technical Barriers

- Forecasting/Settlement Needs: Timely Hourly Customer Interval Usage Data from IOUs
- Billing Needs: PG&E Billing Transaction Data Lacks Necessary Interval Data
- Data Needs on Customer Enrollment in Demand Response and Dynamic Pricing
- Bill Presentment for Bundled and Unbundled Customers
- CCA Inability to Fulfill Customer Rate Changes

➢ Other Barriers

- Equity Issues
- CCA Governing Board Authority

1. CCA Forecasting/Settlement Needs: Timely Hourly Customer Interval Usage Data From IOUs (Lucas Utouh/Justin Kudo)

IOU	Issues	RTP Barrier	Proposed Solutions
PG&E	• Hourly, non-validated data is available up to three days after usage occurs through ShareMyData (SMD) portal • However, data is not reliable, has gaps, does not match UtilityAPI data, etc	• Prevents CCAs from timely tracking of load correlation from RTP • Hampers load forecasting (ESQMD and Day ahead load forecast submissions to CAISO) to promote load management/ grid reliability	• For all IOUs, CPUC should require, and allocate funding to develop, systems/processes to provide hourly/sub-hourly billing quality data with minimal latency to CCAs (within two days or less after power flow) • Systems must allow for transfer of large amounts of data to CCAs, accommodate multiple users, allow for more targeted queries to access missing data, and limit data gaps
SCE/ SDG&E	• Hourly interval data not provided to CCAs until close of billing cycle (29-31 days after power flow)		

2. Billing Needs: PG&E* Billing Transaction Data Lacks Necessary Interval Data (Justin Kudo)

Issues with PG&E*	RTP Barrier	Proposed Solutions
• PG&E billing transactions only provide summary usage aggregated to PG&E's defined TOU periods (e.g., 150 kWh Peak, 350 kWh Off Peak); most do not include hourly interval usage • SMD is not reliable, billing quality, or scalable; using it would result in billing exceptions • To ensure integrity of data, CCAs and PG&E must bill on same usage	• Hourly/sub-hourly interval data necessary for CCA RTP	• CPUC should require, and provide funding to PG&E, to develop systems and processes to provide timely hourly/sub-hourly billing quality data with minimal latency to CCAs

*SCE and SDG&E do provide hourly/sub-hourly intervals for billing most customer classes (but as noted on previous slide, information is not provided in timely manner for forecasting/settlement needs)

3. Data Needs on Customer Enrollment in Demand Response (DR) and Dynamic Pricing Programs (Sabrinna Soldavini)

Issue	RTP Barrier	Proposed Solution
• Dual enrollment in multiple DR programs disallowed under Commission rules • IOUs do not provide to CCAs which customers in their service area are enrolled in other DR programs to allow CCAs to enroll customers (verifying eligibility and preventing dual-enrollment)	• If Demand Flexibility rules prohibit dual enrollment, CCAs will not have the information necessary to comply with such rules when enrolling customers in CCA Demand Flexibility programs that take advantage of dynamic pricing	• CPUC requires the IOUs to provide monthly updates to CCAs on customer enrollment in all DR programs (load-modifying and supply side, programs administered by IOU/CCA and/or third-parties, and behavioral and device-enabled load management programs)

4. Bill Presentment (Karen Schmidt)

Issues	RTP Barrier	Proposed Solutions
• Equivalent bill presentation not always provided to bundled and unbundled customers	• How will RTP charges be presented to customers? • What tables and visualizations will be utilized?	• The CPUC should ensure that CCA customers have equivalent information/ experience when reviewing their bill as IOU customer
• IOU presentation of own rates as proxy for CCA rates	• Unless CCAs follow IOU rates, the IOU presentation of its own rates as a proxy for CCA rates is inaccurate • Limits CCAs from presenting accurate rate information to customers	• The CPUC should require IOUs to provide all customers with actual CCA rates in billing presentment and data visualizations, until price machine outputs are available

5. CCA Inability to Fulfill Customer Rate Changes (Justin Kudo)

Issue	RTP Barrier	Proposed Solution
• IOUs do not currently accept rate change requests from CCAs for customers (i.e., CCA customer must contact IOU directly)	• CCAs directing customers to contact their IOU to initiate a rate change to RTP will reduce RTP participation	• The CPUC should require IOUs to allow CCAs to fulfill customer requests for rate change to RTP to enhance customer experience and participation • IOUs can also benefit from reduced customer care interactions

6. Other CCA RTP Barriers (Sabrinna Soldavini)

- **Equity/CCA Governing Boards**
  - Lack of CCA customer access to energy management system/devices
- **CCA Governing Boards**
  - Any dynamic rate offerings by a CCA must be approved by a CCA's Governing Board
  - Dynamic rate offerings by CCAs may vary from those offered by IOUs