Application: A.25-12-019
Exhibit No.: ____________________
Witness: Amy D. Vulin

REVISED

PREPARED DIRECT TESTIMONY OF

AMY D. VULIN

ON BEHALF OF

SOUTHERN CALIFORNIA GAS COMPANY (U 904 G)

(CHAPTER III – TECHNOLOGY)

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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PREPARED DIRECT TESTIMONY OF
AMY D. VULIN
(TECHNOLOGY)

I. INTRODUCTION AND OVERVIEW

My testimony supports Southern California Gas Company's (SoCalGas) Application for Authorization to Implement Revenue Requirement for Advanced Meter Infrastructure Replacement Project (Application). The purpose of my direct testimony is to describe the technology components and activities of the Advanced Meter Infrastructure Replacement (AMIR) Project. My testimony will explain (1) the proposed technology replacement scope; (2) the associated cost forecast and underlying cost methodology; and (3) the roadmap for technology implementation.

As detailed in the Direct Testimony of David M. Mercer (Chapter II), existing meter communication modules (module) are expected to experience large-scale failures beginning in 2030 as batteries reach end of life and modules require replacement. The current module is also being phased out with production expected to cease mid-2031, with the manufacturer no longer producing the current module beyond that required to serve existing warranty obligations through 2038. Given the AMI system is an integrated system, supporting components including the Communication Network and SoCalGas Systems (e.g., the HeadEnd System and the Meter Data Management (MDM) System) must also be replaced or reintegrated to maintain system compatibility and to support evolving cybersecurity needs (*see* Figure III-1 below for an overview of these components). Moreover, several of these components will no longer be supported by the manufacturer after 2038 and, until then, only limited support will be available. Accordingly, SoCalGas proposes a planned, systemwide replacement of modules and corresponding supporting technology.

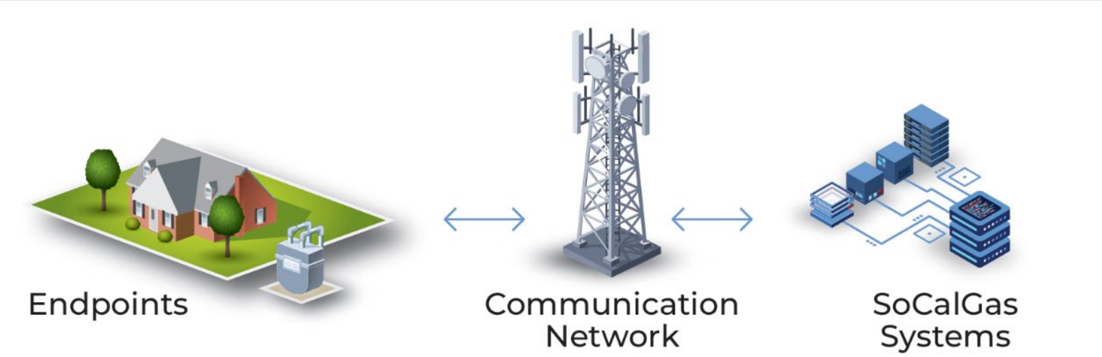
SoCalGas is requesting recovery of $23.382 million in direct operating and maintenance (O&M) costs and $894.990 million in direct capital costs, totaling $918.372 million in direct costs for the technology components and activities of the AMIR Project.[1]

[1] Direct costs are presented in unescalated and unloaded dollars, including the base cost of labor, materials, and contracts, before the application of escalation and overheads.

II. THE AMIR PROJECT TECHNOLOGY COMPONENTS

The AMIR Project technology is categorized into three major components: (1) Endpoints, (2) the Communication Network, and (3) SoCalGas Systems. Figure III-1 below depicts these components.

Figure III-1 – AMIR Technology Components



A. Endpoints

Endpoints primarily consist of more than six million modules.[2] These modules are electronic devices attached to customer meters that record and transmit meter readings and other operational data through the Communication Network to SoCalGas Systems. Each module contains an integrated network interface card that automatically and securely transmits data through the Communication Network to SoCalGas Systems (e.g., to the HeadEnd System which serves as the central processing hub, or "system brain," of the AMI system). To confirm system interoperability, a single AMI Technology Vendor is necessary to support seamless communication across all components of the Advanced Metering Infrastructure (AMI) system, including Endpoints, the Communications Network, and SoCalGas Systems (e.g., the HeadEnd System).

As explained in the Direct Testimony of David M. Mercer (Chapter II), the module end of life analyses for SoCalGas's current AMI system confirm that modules are approaching the

[2] While the majority of the Endpoint costs are for new meter modules, costs also include new modules for electronic pressure monitors (EPMs), electronic volume correctors (EVCs), and electronic correctors (ECs) which enable transmission of pressure and volume data through the Communication Network to SoCalGas Systems. SoCalGas also anticipates minor ancillary replacements, including approximately two percent meter breakage during module installation, and replacement of all ECs since the instrument and module typically cannot be separated without breaking the instrument. For additional information on module, instrument, and meter counts, *see* Table III-3.

end of their useful life and that widespread failures are expected to begin in 2030. Moreover, in addition to the projected end of life battery failures, the current module itself is becoming obsolete, with the manufacturer no longer producing the current module at any scale after mid-2031 beyond what is required to service the existing warranty obligations. Accordingly, SoCalGas proposes the AMIR Project, a planned, systemwide replacement for its AMI system where it will replace more than six million modules to preserve existing functions and benefits while incorporating enhanced processing capability, more timely data transmission, and cybersecurity features.[3]

B. Communication Network

A secure and scalable two-way gas communication network forms the foundation of SoCalGas's AMI system, enabling data transmission between Endpoints and SoCalGas Systems, including the AMI Core Systems (i.e., the HeadEnd System, the MDM System, and the NEMO System) and Connected Systems (Connected AMI Systems and Deployment Systems) (*see* Figure III-2). The Communication Network supports automated, near real-time data collection from more than six million customer meters and pressure monitoring devices, providing the secure transmission of usage and operational data. The current Communication Network is comprised of three primary components:

- The Radio Frequency Network: Transmits data between each module and the Network Communication Device (NCD) on a licensed radio spectrum.
- The Network Communication Device (NCD): Serves as the aggregation point that collects data from multiple modules.
- Cellular Network: Transmits data from the NCDs to SoCalGas Systems (e.g., to the HeadEnd System "or "system brain" for centralizing processing and integration with the MDM System or "system storage" and other enterprise systems).

The current AMI Communication Network consists of approximately 4,700 NCDs operating on SoCalGas's encrypted network and spans approximately 24,000 square miles of diverse terrain across Central and Southern California. These NCDs provide continuous coverage across urban, suburban, and rural environments, providing consistent communication with endpoints even under challenging geographic and environmental conditions.

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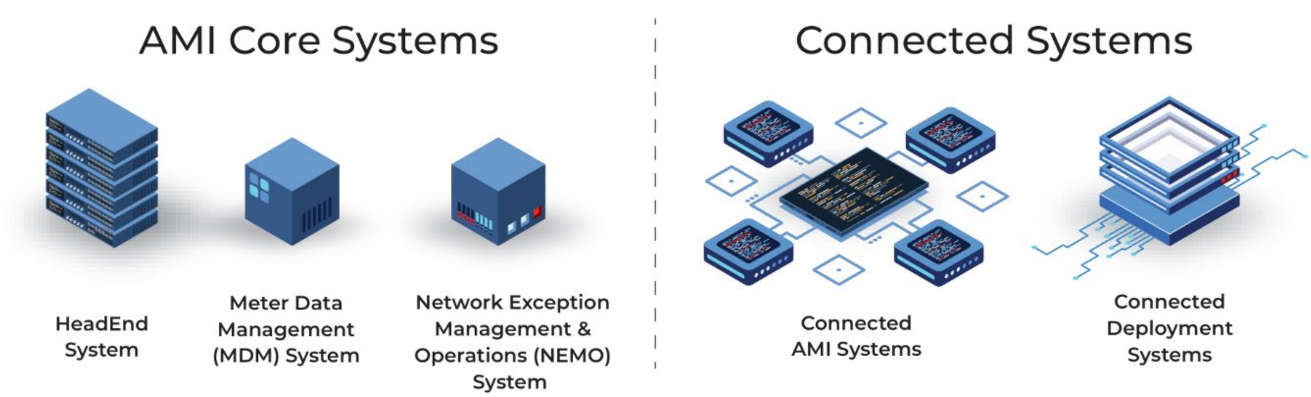
[3] For details regarding the essential benefits the AMIR Project preserves and enhances, refer to the Direct Testimony of Jennifer L. Walker (Chapter I).

The replacement Communication Network will maintain these core functions while incorporating several enhanced capabilities to meet modern operational and cybersecurity needs. Specifically, the modernized network will securely prioritize traffic for safety-critical messages, provide more frequent and timely usage data transmission, and incorporate modern cybersecurity standards with expanded bandwidth to support future endpoint technologies. The AMIR Project scope encompasses the full lifecycle of network implementation, including system design, configuration, testing, and transition to production. Following deployment, legacy network equipment will be decommissioned, with obsolete hardware removed and disposed of as part of the project closeout.

C. SoCalGas Systems

SoCalGas Systems include applications, software, and information technology (IT) platforms that support the AMI system. These systems are divided into two categories, AMI Core Systems and Connected Systems. The AMI Core Systems include: (1) the HeadEnd System (or the "system brain"); (2) the Meter Data Management (MDM) System (or "system storage"); and (3) the Network Exception Management and Operations (NEMO) System (or "system health"). The Connected Systems include: (1) Connected AMI Systems (or "enterprise systems"), and (2) Connected Deployment Systems (or "module implementation systems"). Figure III-2 below depicts these system components.

Figure III-2 - SoCalGas Systems



1. AMI Core Systems

a. The HeadEnd System

The HeadEnd System (or "system brain") manages the Endpoints and the Communication Network. The HeadEnd System interfaces with SoCalGas Systems including systems responsible for work order management, AMI system performance, meter usage data storage, and enterprise applications. Its primary functions include encrypting and decrypting data, collecting and processing endpoint data, handling usage requests, and managing field assets (e.g., performing firmware updates). The HeadEnd System also enables all system programming capabilities, such as adjusting module transmission intervals during emergencies or extreme weather events. The HeadEnd System must be replaced to maintain compatibility with the replacement modules. Moreover, the current software will become obsolete as the manufacturer will no longer support this legacy system after 2038 and, until then, only limited support is available. The replacement HeadEnd System will be compatible with replacement modules and preserve essential capabilities, while introducing on-demand usage requests, enhanced two-way communication, and support for new endpoint technologies such as ultrasonic meters with remote valve control (to allow the stoppage of gas flow) and residential methane detectors.

The replacement HeadEnd System will also include a modern cloud-based software platform with an integrated design to support all AMI SoCalGas systems. This new platform will provide greater scalability, cybersecurity controls, and interoperability with enterprise applications. This modernized platform will also serve as the transformation layer, integrating data from the current and replacement systems to facilitate the transition to the new system while maintaining data integrity.

b. The Meter Data Management (MDM) System

The MDM System (or "system storage") functions as the official system of record for AMI metering data, receiving usage information from the HeadEnd System. The MDM System performs validations, identifies missing reads and estimates usage, and supports billing. Replacement of the MDM System is required to support continued communication with the replacement HeadEnd System and other SoCalGas enterprise applications. Moreover, the software company will no longer support this legacy system after 2038 and, until then, only limited support is available. The replacement MDM System will maintain the functions and benefits of the current system.

c. Network Exception Management and Operations (NEMO) System

The current NEMO System (or "system health") provides the analytical and monitoring capabilities to maintain visibility into the performance of the modules and the communication network. The current NEMO System is a custom-developed application that provides automated reporting, data aggregation, and advanced visualization tools. It enables SoCalGas to diagnose, detect, analyze, and manage device and communication issues, monitor the health of the network and modules, and identify field device or equipment conditions that may require maintenance or corrective action.

A replacement NEMO system will be required as changes in the data structure of the replacement modules and the HeadEnd System will create incompatibility. The replacement NEMO System will be a configurable, commercial off-the-shelf cloud solution, tailored to SoCalGas's operational needs. The replacement NEMO System will enhance performance monitoring and issue management through scalable analytics, automated event detection, and cross-system correlation. These capabilities will minimize service disruptions, optimize the use of field resources, and strengthen situational awareness across the AMI network.

2. Connected Systems

a. Connected AMI Systems

Connected AMI Systems are enterprise applications that rely on AMI data for safety monitoring, customer billing, operations, procurement, and analytics functions. These include:

- <u>Safety Systems</u> (e.g., Aveva Pi, Gas Control Center systems, Continuous Consumption Analytics, Emergency Services and Safety Monitoring, Top View)
- <u>Customer & Billing Systems</u> (e.g., Core Balancing, Gas Measurement & Analysis, Customer Information (Vista), My Account, Bill Tracker)
- <u>Enterprise Integration & Automation Systems</u> (e.g., Control-M, Electronic Data Interchange (EDIX))
- <u>Enterprise Systems</u> (e.g., Work Order Management (Dispatch, Industrial and Financial Systems (IFS), Click), System Applications and Products in Data Processing (SAP))
- <u>Data Analytics</u> (e.g., High Performance Operational Data Store, Data Warehouse & Strategic Transformation of Analytics & Reporting, NetOps)

The Connected AMI Systems must be reintegrated to maintain compatibility and interoperability with the AMI Core Systems. There are two categories of reintegration activities. The first involves modifications to operations-critical applications for which the software is not directly controlled by SoCalGas, thereby limiting the scope of remediations that SoCalGas can perform independently and necessitating reliance on the respective software vendors to implement required changes. These entities will perform the required changes or provide consulting support for end-to-end workflow testing and integration validation. The second category involves efforts to minimize remediation activities using middleware solutions, or by facilitating the integration of new data into the system, while endeavoring to limit modifications to existing applications.

The remediation work will include implementing a new data platform to maintain data availability across all impacted Connected AMI Systems, updating and validating existing applications and interfaces, providing infrastructure support, and developing non-production and test environments to verify system functionality. These activities will allow enterprise applications to continue receiving accurate and timely AMI data so that downstream processes will remain uninterrupted.

b. Connected Deployment Systems

The successful implementation of the AMIR Project depends on a coordinated approach to customer deployment and field execution, effectively managed and orchestrated through software systems. Connected Deployment Systems are the systems that coordinate field activities, workforce logistics, and asset tracking to support successful implementation of the AMIR Project. There are four Connected Deployment Systems areas that require enhancements to the current software, or new software, to support deployment activities and provide the digital foundation to coordinate installation schedules, manage workforce logistics, resolve customer issues efficiently, and maintain digital records and asset tracking: (1) Customer Contact Center Systems, (2) Dispatch, (3) Mobile Workforce Management and Work Order System, and (4) Inventory Control. In addition, field installers will require new equipment to enable on-site activation and deactivation of replacement modules using handheld devices.

The primary drivers for the Connected Deployment Systems enhancements are the increased system capacity needs resulting from the addition of approximately five hundred field technicians and the introduction of new processes, assets, tools, and procedures necessary to support efficient operations for the deployment of more than six million modules.[4]

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[4] For more information regarding AMIR Project deployment, refer to the Direct Testimony of Linden S. Olah (Chapter IV).

These Connected Deployment Systems will comprise a secure and modular platform built on extensible architecture that enables effective field data collection with minimal disruption to existing operations. Scalability will be achieved through horizontal scaling, which allows dynamic addition of cloud-based servers in response to workload demands. This approach facilitates dynamic deployment of new system capabilities and provides timely access to updated software releases.

III. FORECASTED COSTS AND METHODOLOGY

A. Overview of Cost Forecast Methodology

SoCalGas developed the technology cost forecast using a range of inputs, including labor estimates, vendor data, and subject matter expertise, to produce a data-driven and reasonable cost estimate for the technology components and activities associated with the AMIR Project. The following describes the process or categorization used to develop the technology cost forecast for the AMIR Project. Additional details are provided in the workpapers supporting my testimony.

1. Functional Decomposition: SoCalGas first defined the scope and work requirements for each system area to clearly identify all activities necessary for implementation. SoCalGas subject matter experts (SME) and consultants collaborated to review the scope of work. Each AMI technology component was broken down into specific activities and associated cost categories, including hardware, software, external labor, and internal labor.
2. Bottom-Up Cost Estimation: SoCalGas then applied a detailed, bottom-up estimation process to quantify costs for each activity. Labor hours, material quantities, vendor pricing, and other associated cost elements were estimated using historical performance, comparable company projects, and current market data (data from outside sources that reflect prevailing industry prices or wage rates). Quantities such as modules, meters, instruments, subscriptions, licenses, and number of users were multiplied by validated unit costs derived from vendor pricing information and SME inputs.
3. Labor: SoCalGas labor cost assumptions were developed through coordination with SMEs and are generally based on the number of full-

time equivalent employees multiplied by the annual labor rate for the relevant job classification.

4. Non-Labor: Vendor Request for Proposal (RFP) responses, SME and consultant estimates, historical costs, invoices, and prior statements of work were used to develop non-labor cost estimates. These inputs established pricing for non-labor items such as hardware, software licenses, subscription fees, configuration, implementation, egress fees, and ongoing support. Using multiple data sources enabled non-labor cost estimates to reflect current market conditions, vendor pricing, and contractual assumptions.

5. Competitive Solicitation (RFI/RFP): SoCalGas conducted Request for Information (RFI) and RFP processes to select qualified and cost-competitive vendors for the AMIR Project.[5] The RFI/RFP process is used to procure major technology components, including the AMI Technology Vendor (modules, hardware, network, software), System Integration Vendor (the HeadEnd System, the MDM System, Connected AMI and Deployment Systems), Network Installation Vendor, and Deployment Software Vendor. SoCalGas's solicitation process evaluates vendors based on technical capability, implementation experience, safety, customer affordability, cost competitiveness, operational efficiency, and market risk. The results of these RFI/RFP processes form the basis for SoCalGas's technology cost forecast.

6. Meter Growth Forecasts: Forecasts are based on estimated demand for new meters expected to be installed as of 2029 year end and are used to inform the total module and meter forecasts.[6]

7. Import Tariffs: Tariffs were assumed and included for equipment hardware, including meters, modules, network equipment and handheld

[5] SoCalGas also plans to conduct additional RFI/RFP solicitations throughout the duration of the AMIR Project, as appropriate.

[6] Costs for module installation for meter growth for 2030 and beyond will be funded through the appropriate General Rate Case (GRC).

devices. Given that the future import tariff is not currently known, a 10 percent tariff was chosen as a conservative planning assumption.

8. Contingency: The contigency framework was developed and implemented through an evaluation of activities at both the category and sub-category levels. This assessment was conducted to determine the degree of risk associated with each area, taking into account factors such as evolving market conditions. Based on the risk profile determined for each area, differentiated contingency rates were applied in a manner proportionate to the identified level of exposure.

The technology cost forecasting methodology reflects a structured and data-driven approach that integrates detailed activity-based forecasting, vendor data and pricing information, market data, SME input, historical cost information, and analysis of comparable internal company projects. The resulting forecasted costs represent a reasonable and supported estimate of the costs required for the technology components and associated activities of the AMIR Project.

B. AMIR Technology Forecasted Costs

SoCalGas is requesting $23.382 million in direct O&M costs and $894.990 million in direct capital costs, totaling $918.372 million in direct costs for AMIR technology activities.[7] O&M costs primarily reflect RFI/RFP and planning activities from 2026 through 2028 and stabilization and maintenance transition activities from 2030 through 2031. Capital costs primarily reflect equipment and software and AMIR system implementation activities, from 2025 to 2034, that result in long-term system capability. Table III-1 below provides the AMIR Technology Total Costs by area (Endpoints, Communication Network, SoCalGas Systems) from 2025 through 2034.

[7] In SoCalGas's Test Year (TY) 2024 GRC Decision (D.) 24-12-074, the Commission authorized a limited amount of technology costs for preliminary upgrades to the HeadEnd System, the MDM System, and NCD hardware. These early upgrades were planned based on the vendor's expected release schedule; however, the vendor's hardware and software were ultimately not commercially available as anticipated, requiring SoCalGas to defer these activities.

Table III-1
AMIR Technology Total Costs (2025-2034)
In 2025 $ (000s)

Technology Areas	Total	O&M	Capital
Endpoints	$ 648,787	$ -	$ 648,787
Communication Network	93,599	9,634	83,965
SoCalGas Systems	175,986	13,748	162,238
Total	**$ 918,372**	**$ 23,382**	**$ 894,990**

1. Endpoints

SoCalGas is requesting $648.787 million in direct capital costs for Endpoint hardware (modules, meters, and instruments) required to support AMIR deployment.[8] Table III-2 below provides the Endpoints costs by cost type.

Table III-2
Endpoint Total Costs by Year
In 2025 $ (000s)

Forecasted Years: 2025-2029

Cost Type	2025	2026	2027	2028	2029
O&M	$ -	$ -	$ -	$ -	$ -
Capital	-	-	-	4,997	122,955
Total	**$ -**	**$ -**	**$ -**	**$ 4,997**	**$ 122,955**

Forecasted Years: 2030-2034

Cost Type	2030	2031	2032	2033	2034	Total
O&M	$ -	$ -	$ -	$ -	$ -	**$ -**
Capital	181,925	172,741	133,982	31,963	223	**648,787**
Total	**$ 181,925**	**$ 172,741**	**$ 133,982**	**$ 31,963**	**$ 223**	**$ 648,787**

While the majority of the Endpoint costs are for new meter modules, costs also include new modules for electronic pressure monitors (EPMs), electronic volume correctors (EVCs), and electronic correctors (ECs) which enable transmission of pressure and volume data through the Communication Network to SoCalGas Systems. SoCalGas also anticipates minor ancillary replacements, including approximately two percent meter breakage during module installation, and replacement of all ECs since the instrument design prohibits module replacement in field. The Endpoint unit counts necessary for the AMIR Project include replacement modules, meters, and instruments, and are provided in Table III-3 below.

[8] The labor to install endpoints is discussed in the Direct Testimony of Linden S. Olah (Chapter IV).

Table III-3
AMIR Deployment Module, Meter, Instrument Counts

Endpoint Type	# Module Replacements	# Meter*/Instrument Replacements
Standard Residential Commercial & Industrial Meters	6,292,300	126,000 (Meters)
Electronic Correctors (EC)	4,500	4,500 (Instruments)
Electronic Volume Correctors (EVC)	1,000	0
Electronic Pressure Monitors (EPM)	2,200	0
Total	**6,300,000**	**130,500**

* Replacement meter quantities have been modeled using a breakage rate of approximately 2% consistent with the original AMI 1.0 program for Meters Damaged During Meter Module Installation.

Table III-4 below summarizes the Endpoints costs by cost category. Additional detailed cost information and assumptions can be found in my supporting workpapers (SCG-III-WP, SCG-III-WP3-01C).

Table III-4
Endpoint Total Costs by Category

Forecasted Years: 2025-2029

Cost Category	2025	2026	2027	2028	2029
Modules, Meters, and Instruments	$ -	$ -	$ -	$ 4,410	$ 104,346
Other	-	-	-	588	18,609
Total	**$ -**	**$ -**	**$ -**	**$ 4,997**	**$ 122,955**

Forecasted Years: 2030-2034

Cost Category	2030	2031	2032	2033	2034	Total
Modules, Meters, and Instruments	$ 153,536	$ 145,338	$ 112,544	$ 26,151	$ -	**$ 546,324**
Other	28,389	27,404	21,437	5,813	223	**102,462**
Total	**$ 181,925**	**$ 172,741**	**$ 133,982**	**$ 31,963**	**$ 223**	**$ 648,787**

The total forecast for the combined cost of Modules, Meters, and Instruments is $546.324 million. The Endpoint vendors will provide all modules, meters, and instruments for purchase in the quantities specified in Table III-3. Each module includes a standard 20-year warranty coverage period, provided by the AMI Technology Vendor, transferring the risk of non-performance and manufacturing defects to the AMI Technology Vendor. The forecast for module unit costs is based on the RFP responses received from the competitive solicitation process, while meter and instrument costs reflect current vendor costs. Although endpoint purchases span from 2028 through 2033, the majority of purchases are projected to occur from 2029 through 2032, one year ahead of mass module deployment.[9]

The total forecast for Other costs is $102.462 million and includes sales tax, import tariffs, and decommissioning costs. Sales taxes were applied using a weighted average rate of 9.13 percent, which reflects the average sales tax rate for the destination cities of the module shipments. Import tariffs were applied to all modules, meters, and instruments anticipated to be sourced outside the United States. Decommissioning and salvage costs for modules were calculated using the weight of legacy modules multiplied by the number of modules removed, along with the salvage cost per pound and shipping costs to the recycling facility. Taxes and tariff costs are aligned with endpoint purchases, which occur from 2028 through 2033**,** and module decommissioning and salvage costs are aligned with the mass module deployment, which is scheduled from 2030 through 2034.

2. The Communication Network

SoCalGas is requesting $9.634 million in direct O&M costs and $83.965 million in direct capital costs, totaling $93.599 million in direct costs to replace the Communication Network. These costs include the procurement of communication network equipment, licensing fees, cellular fees, and materials; external labor for system design, configuration, and deployment; and the decommissioning of existing communication network equipment at approximately 4,700 locations in coordination with the transition to the new communication network. Table III-5 below provides the Communication Network costs by cost type (O&M and capital). Table III-6 below summarizes the Communication Network costs by cost category. Additional detailed cost information, assumptions, and cost sources can be found in my supporting workpapers (SCG-III-WP, WP3-02C).

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9 For more information regarding deployment, refer to the Direct Testimony of Linden S. Olah (Chapter IV).

Table III-5
Communication Network Total Costs by Year
In 2025 $ (000s)

Forecasted Years: 2025-2029					
Cost Type	2025	2026	2027	2028	2029
O&M	$ -	$ 374	$ 374	$ 236	$ 369
Capital	-	131	2,501	2,385	26,576
Total	**$ -**	**$ 504**	**$ 2,875**	**$ 2,621**	**$ 26,946**

Forecasted Years: 2030-2034						
Cost Type	2030	2031	2032	2033	2034	**Total**
O&M	$ 1,799	$ 2,688	$ 1,397	$ -	$ 2,398	**$ 9,634**
Capital	38,738	13,634	-	-	-	**83,965**
Total	**$ 40,537**	**$ 16,322**	**$ 1,397**	**$ -**	**$ 2,398**	**$ 93,599**

Table III-6
Communication Network Total Costs by Category
In 2025 $ (000s)

Forecasted Years: 2025-2029					
Cost Category	2025	2026	2027	2028	2029
Network Deployment	$ -	$ 504	$ 2,875	$ 2,621	$ 26,946
Decommissioning	-	-	-	-	-
Total	**$ -**	**$ 504**	**$ 2,875**	**$ 2,621**	**$ 26,946**

Forecasted Years: 2030-2034						
Cost Category	2030	2031	2032	2033	2034	**Total**
Network Deployment	$ 40,537	$ 16,322	$ -	$ -	$ -	**$ 89,804**
Decommissioning	-	-	1,397	-	2,398	**3,795**
Total	**$ 40,537**	**$ 16,322**	**$ 1,397**	**$ -**	**$ 2,398**	**$ 93,599**

The total forecast for Network Deployment is $89.804 million. This forecast includes costs for communication hardware, cellular data transmission fees, network installation and document management tools, network deployment permitting and easements, and labor for deployment and configuration. Network hardware, data transmission, and installation fees are projected to occur primarily from 2029 through 2031 and are aligned with mass module deployment to support network readiness.

The forecast for Decommissioning costs is $3.795 million. This forecast includes internal labor, contractor support, and disposal fees associated with the removal of approximately 4,700 legacy network devices. This forecast is based on internal labor estimates and current vendor pricing from existing third-party contracts. Network decommissioning costs are projected to occur in 2032 and 2034, following the completion of network replacement.

3. SoCalGas Systems

SoCalGas is requesting $13.748 million in direct O&M costs and $162.238 million in direct capital costs, totaling $175.986 million in direct costs to replace and reintegrate SoCalGas Systems. These costs include system transition process, software implementation, integration services, subscription fees, and the related internal labor required to manage, test, and validate the continued operation and interoperability of the AMIR technology platform. Table III-7 below provides the SoCalGas Systems costs by cost type (O&M and capital). Table III-8 below summarizes the SoCalGas Systems costs by area. Additional detailed cost information, assumptions, and cost sources can be found in my supporting workpapers (SCG-III-WP, SCG-III-WP3-03C, SCG-III-WP3-04C, and SCG-III-WP3-05).

Table III-7
SoCalGas Systems Total Costs by Year
In 2025 $ (000s)

Forecasted Years: 2025-2029					
Cost Type	2025	2026	2027	2028	2029
O&M	$ -	$ 565	$ 297	$ 783	$ 620
Capital	2,155	6,425	38,457	48,847	41,299
Total	**$ 2,155**	**$ 6,990**	**$ 38,754**	**$ 49,630**	**$ 41,919**

Forecasted Years: 2030-2034						
Cost Type	2030	2031	2032	2033	2034	**Total**
O&M	$ 4,929	$ 5,102	$ 484	$ 484	$ 484	**$ 13,748**
Capital	9,552	11,559	1,616	1,348	980	**162,238**
Total	**$ 14,481**	**$ 16,661**	**$ 2,100**	**$ 1,832**	**$ 1,464**	**$ 175,986**

Table III-8
SoCalGas Systems Total Costs
In 2025 $ (000s)

SoCalGas Systems	**Total**	**O&M**	**Capital**
AMI Core Systems	$ 104,226	$ 5,137	$ 99,088
Connected Systems	71,761	8,611	63,150
Total	**$ 175,986**	**$ 13,748**	**$ 162,238**

a. AMI Core System

SoCalGas is requesting $5.137 million in direct O&M costs and $99.088 million in direct capital costs, totaling $104.226 million in direct costs to replace the AMI Core Systems. This category includes costs to implement the HeadEnd System, the MDM System, and NEMO Systems. Table III-9 below provides the AMI Core System costs by area.

Table III-9
AMI Core Systems Total Costs
In 2025 $ (000s)

AMI Core Systems	Total	O&M	Capital
HeadEnd System	$ 71,683	$ 3,677	$ 68,006
MDM System	21,710	1,091	20,619
NEMO System	10,832	369	10,463
Total	**$ 104,226**	**$ 5,137**	**$ 99,088**

(1) The HeadEnd System

SoCalGas is requesting $3.677 million in direct O&M costs and $68.006 million in direct capital costs, totaling $71.683 million in direct costs to replace its HeadEnd System. These costs include system planning, design, configuration, testing, implementation, and stabilization of the software, as well as the data migration, cybersecurity, and integration activities necessary to support communication with endpoints and SoCalGas enterprise systems. Table III-10 below provides the HeadEnd System costs by cost type (O&M and capital). Table III-11 below summarizes the HeadEnd System costs by cost category. Additional detailed cost information and assumptions can be found in my supporting workpapers (SCG-III-WP, WP3-03C).

Table III-10
HeadEnd System Total Costs by Year
In 2025 $ (000s)

Forecasted Years: 2025-2029

Cost Type	2025	2026	2027	2028	2029
O&M	$ -	$ 565	$ -	$ 13	$ 44
Capital	2,155	3,709	18,737	20,311	13,858
Total	**$ 2,155**	**$ 4,274**	**$ 18,737**	**$ 20,324**	**$ 13,903**

Forecasted Years: 2030-2034

Cost Type	2030	2031	2032	2033	2034	Total
O&M	$ 1,443	$ 1,612	$ -	$ -	$ -	**$ 3,677**
Capital	3,124	6,112	-	-	-	**68,006**
Total	**$ 4,567**	**$ 7,723**	**$ -**	**$ -**	**$ -**	**$ 71,683**

Table III-11
HeadEnd System Total Costs by Category
In 2025 $ (000s)

Forecasted Years: 2025-2029					
Cost Category	2025	2026	2027	2028	2029
Software	$ -	$ -	$ 1,100	$ 1,113	$ 1,286
External Labor	1,981	2,699	13,568	13,069	6,515
Internal Labor	174	1,575	4,069	6,141	6,101
Total	**$ 2,155**	**$ 4,274**	**$ 18,737**	**$ 20,324**	**$ 13,903**

Forecasted Years: 2030-2034						
Cost Category	2030	2031	2032	2033	2034	**Total**
Software	$ 2,971	$ 6,125	$ -	$ -	$ -	**$ 12,595**
External Labor	166	-	-	-	-	**37,999**
Internal Labor	1,430	1,599	-	-	-	**21,090**
Total	**$ 4,567**	**$ 7,723**	**$ -**	**$ -**	**$ -**	**$ 71,683**

The total forecast for Software is $12.595 million. This forecasted cost is primarily for AMI Technology Vendor subscription fees for the production, disaster recovery, test, and quality assurance (QA) environments required for this type of software development project.
The forecast for software subscription fees was based on the RFP responses received from the competitive solicitation process. Software subscription costs are priced per-module and are projected to begin in 2027 and ramp up through 2031.

The total forecast for External Labor is $37.999 million which includes costs for (1) the AMI Technology Vendor, (2) the System Integration (SI) Vendor, (3) the Security Consulting Vendor, and (4) the AMI Solicitation Vendor.

1. <u>AMI Technology Vendor - $14.550 million:</u> This forecast includes labor costs for implementation support and system customization services necessary to configure the HeadEnd System in alignment with business requirements and to enable interoperability with the MDM System. The forecast for AMI technology vendor labor costs was based on RFP responses received from the competitive solicitation process. AMI Technology Vendor costs are projected to occur from 2027 through 2029.
2. <u>Systems Integrator (SI) Vendor</u> – $19.500 million: This forecast includes systems planning, architecture design, and software implementation labor for the AMI Core Systems. The scope also includes developing a

transition strategy, configuring a transitional environment, and designing a phased cutover process between the legacy and replacement HeadEnd Systems. These activities are required to maintain uninterrupted operational connectivity between the HeadEnd System and the Connected AMI Systems. The cost forecast for the SI Vendor was developed using multiple vendor proposals. SoCalGas solicited and evaluated proposals from multiple SI vendors to support integration of the HeadEnd System, the MDM System, the Connected AMI Systems, and the Connected Deployment Systems. These quotations were used to validate total estimated labor hours across workstreams, with adjustments informed by SMEs based on experience from the initial AMI deployment and comparable SoCalGas projects. The total SI Vendor hours were then distributed proportionally according to project scope and multiplied by a blended SI billing rate to derive cost estimates for each workstream. SoCalGas allocated 72,750 hours to the HeadEnd System integration workstream. SoCalGas will conduct a formal RFP process in 2026 to select an SI Vendor with demonstrated AMI systems integration expertise and large-scale utility experience to support the AMIR technology implementation. SI vendor costs are projected to occur from 2026 through 2029.

3. Security Consulting Vendor – $2.153 million: This forecast includes costs for the cyber and physical security, as well as architecture and design reviews for alignment with company IT standards and processes, penetration testing, and lifecycle assessments. The forecast for labor pricing for penetration testing was developed using comparable scopes of work from prior security projects performed by established SoCalGas vendors. The remaining cybersecurity scope was defined in collaboration with the SoCalGas SMEs. Security consulting vendor costs began in 2025, supporting the RFI/RFP process, and are projected to continue through 2030.

4. AMI Solicitation Vendor – $1.796 million: This forecast includes costs for the support for the execution of both the AMI RFI and RFP processes, including vendor evaluation, procurement support, and assistance with the vendor selection process. A competitive solicitation was performed for third-party advisory in 2024. The consulting vendor for AMI solicitation costs primarily occurred in 2025 and some costs are projected to occur in 2026.

The total forecast for Internal Labor is $21.090 million to support implementation and management activities for the replacement HeadEnd System. Forecasts were developed using bottom-up cost estimating with SoCalGas SMEs, informed by the initial AMI deployment and comparable company projects. Approximately 216,500 hours are projected from 2025 through 2029 to define detailed system requirements, manage the design, testing, implementation, and stabilization, followed by approximately 35,400 hours projected from 2030 through 2031 for ongoing stabilization and maintenance.

(2) The MDM System

SoCalGas is requesting $1.091 million in direct O&M costs and $20.169 million in direct capital costs, totaling $21.710 million in direct costs to replace its MDM System. Table III-12 below provides the MDM System costs by cost type (O&M and capital). Table III-13 below summarizes the MDM System costs by cost category. Additional detailed cost information, assumptions, and cost sources can be found in my supporting workpapers (SCG-III-WP, WP3-04C).

Table III-12
Meter Data Management System Total Costs by Year
In 2025 $ (000s)

Forecasted Years: 2025-2029					
Cost Type	2025	2026	2027	2028	2029
O&M	$ -	$ -	$ -	$ 4	$ 4
Capital	-	-	5,095	5,819	6,154
Total	**$ -**	**$ -**	**$ 5,095**	**$ 5,823**	**$ 6,158**

Forecasted Years: 2030-2034						
Cost Type	2030	2031	2032	2033	2034	**Total**
O&M	$ 541	$ 541	$ -	$ -	$ -	**$ 1,091**
Capital	1,084	2,467	-	-	-	**20,619**
Total	**$ 1,626**	**$ 3,008**	**$ -**	**$ -**	**$ -**	**$ 21,710**

Table III-13
Meter Data Management System Total Costs
In 2025 $ (000s)

Forecasted Years: 2025-2029										
Cost Category		2025		2026		2027		2028		2029
Software	$	-	$	-	$	251	$	256	$	324
External Labor		-		-		3,790		3,790		3,790
Internal Labor		-		-		1,054		1,777		2,045
Total	**$**	**-**	**$**	**-**	**$**	**5,095**	**$**	**5,823**	**$**	**6,158**

Forecasted Years: 2030-2034												
Cost Category		2030		2031		2032		2033		2034		**Total**
Software	$	1,089	$	2,471	$	-	$	-	$	-	**$**	**4,390**
External Labor		-		-		-		-		-		**11,370**
Internal Labor		537		537		-		-		-		**5,950**
Total	**$**	**1,626**	**$**	**3,008**	**$**	**-**	**$**	**-**	**$**	**-**	**$**	**21,710**

The total forecast for Software is $4.390 million. The forecast is primarily for AMI Technology Vendor subscription fees for the production, disaster recovery, test, and QA environments required for this type of software development project. The forecast for software subscription fees was based on RFP responses received from the competitive solicitation process. The majority of software subscription costs are priced per-module and are projected to begin in 2027 and ramp up through 2031.

The total forecast for External Labor is $11.370 million which includes costs to engage both the AMI Technology Vendor and a SI Vendor.

1. AMI Technology Vendor - $4.770 million: This forecast includes costs to implement the MDM System and customize it to align with SoCalGas's billing needs. The forecast for external labor costs were based on RFP responses received from the competitive solicitation process. The AMI Technology Vendor costs are projected to occur from 2027 through 2029.
2. SI Vendor - $6.600 million: This forecast reflect costs to develop a transition strategy, configure a transitional environment, and design a phased cutover process between the legacy and replacement MDM systems. These activities are required to maintain system functionality during migration and to maintain uninterrupted operational connectivity between the MDM system and the Connected AMI Systems, including

systems supporting safety, customer service, and billing. The SI Vendor cost forecast applies the same methodology as described for the HeadEnd System, utilizing vendor proposals, SME input, and allocation of labor hours across workstreams using a blended billing rate. SoCalGas allocated 25,000 hours to the MDM SI workstream. These services are expected to be performed from 2026 through 2029.

The total forecast for Internal Labor is $5.950 million to support implementation and management activities for the replacement MDM System. Forecasts were developed using bottom-up cost estimating with SoCalGas SMEs, informed by the initial AMI deployment and comparable company projects. Approximately 60,500 hours are projected from 2027 through 2029 to define system requirements and manage the design, testing, implementation, and stabilization, followed by approximately 12,500 hours projected from 2030 through 2031 for ongoing stabilization and maintenance.

(3) NEMO System

SoCalGas is requesting $0.369 million in direct O&M costs and $10.463 million in direct capital costs, totaling $10.832 million for the implementation of the replacement NEMO System. Table III-14 below provides the NEMO System costs by cost type (O&M and capital). Table III-15 below summarizes the NEMO System costs by cost category. Additional detailed cost information, assumptions, and cost sources can be found in my supporting workpapers (SCG-III-WP, WP3-05).

Table III-14
NEMO System Total Costs by Year
In 2025 $ (000s)

Forecasted Years: 2025-2029

Cost Type	2025	2026	2027	2028	2029
O&M	$ -	$ -	$ 97	$ 194	$ -
Capital	-	-	6	3,071	5,153
Total	**$ -**	**$ -**	**$ 104**	**$ 3,266**	**$ 5,153**

Forecasted Years: 2030-2034

Cost Type	2030	2031	2032	2033	2034	Total
O&M	$ -	$ 77	$ -	$ -	$ -	**$ 369**
Capital	1,678	554	-	-	-	**10,463**
Total	**$ 1,678**	**$ 632**	**$ -**	**$ -**	**$ -**	**$ 10,832**

Table III-15
NEMO System Total Costs by Category
In 2025 $ (000s)

Forecasted Years: 2025-2029										
Cost Category		2025		2026		2027		2028		2029
Software	$	-	$	-	$	-	$	-	$	-
External Labor		-		-		-		2,750		4,400
Internal Labor		-		-		104		516		753
Total	**$**	-	**$**	-	**$**	**104**	**$**	**3,266**	**$**	**5,153**

Forecasted Years: 2030-2034												
Cost Category		2030		2031		2032		2033		2034		**Total**
Software	$	554	$	554	$	-	$	-	$	-	**$**	**1,109**
External Labor		-		-		-		-		-		**7,150**
Internal Labor		1,123		77		-		-		-		**2,573**
Total	**$**	**1,678**	**$**	**632**	**$**	-	**$**	-	**$**	-	**$**	**10,832**

The total forecast for Software is $1.109 million. These costs are for the NEMO Software Vendor subscription fees for the production, disaster recovery, test, and QA environments required for this type of software development project. Subscription fee amounts were based on the current NEMO System subscription costs. Software costs are projected to occur from 2030 through 2031.

The total forecast for External Labor is $7.150 million. The forecast is for costs to engage a software vendor to provide a customized off-the-shelf solution that meets SoCalGas's communication network and endpoint performance management needs. The forecast for external labor was based on RFP responses received from a competitive solicitation process in 2020 for the current NEMO System. External labor costs are projected to occur from 2028 through 2029.

The total forecast for Internal Labor is $2.573 million to support implementation and management activities for the replacement NEMO System. The forecast was developed using bottom-up cost estimating with SoCalGas SMEs, informed by the current NEMO solution and comparable company projects. Approximately 33,000 hours are projected from 2027 through 2030 to define system requirements and manage the design, testing, implementation, and stabilization, followed by approximately 1,000 hours planned in 2031 for ongoing stabilization and maintenance.

a. Connected Systems

SoCalGas is requesting $71.761 million; $8.611 million in direct O&M costs and $63.150 million in direct capital costs to reintegrate the Connected Systems. Table III-16 below provides the Connected System cost by area.

Table III-16
Connected Systems Total Costs
In 2025 $ (000s)

Connected Systems	Total	O&M	Capital
Connected AMI Systems	$ 48,947	$ 6,631	$ 42,316
Connected Deployment Systems	22,814	1,980	20,834
Total	**$ 71,761**	**$ 8,611**	**$ 63,150**

(4) Connected AMI Systems

SoCalGas is requesting $6.631 million in direct O&M costs and $42.316 million in direct capital costs, totaling $48.947 million in direct costs to develop new data interfaces and reconnect approximately 20 Connected AMI Systems to the replacement HeadEnd System and MDM System. Table III-17 below provides the Connected AMI Systems costs by cost type (O&M and capital). Table III-18 below summarizes the Connected AMI Systems costs by cost category. Additional detailed cost information, assumptions, and cost sources can be found in my supporting workpapers (SCG-III-WP, WP3-06).

Table III-17
Connected AMI Systems Total Costs by Year
In 2025 $ (000s)

Forecasted Years: 2025-2029

Cost Type	2025	2026	2027	2028	2029
O&M	$ -	$ -	$ 200	$ 572	$ 572
Capital	-	2,716	12,534	13,595	11,536
Total	**$ -**	**$ 2,716**	**$ 12,733**	**$ 14,167**	**$ 12,108**

Forecasted Years: 2030-2034

Cost Type	2030	2031	2032	2033	2034	Total
O&M	$ 2,680	$ 2,608	$ -	$ -	$ -	**$ 6,631**
Capital	828	784	-	-	323	**42,316**
Total	**$ 3,509**	**$ 3,392**	**$ -**	**$ -**	**$ 323**	**$ 48,947**

Table III-18
Connected AMI System Total Costs by Category
In 2025 $ (000s)

Forecasted Years: 2025-2029					
Cost Category	2025	2026	2027	2028	2029
Software	$ -	$ -	$ 320	$ 1,100	$ 1,100
External Labor	-	2,559	9,896	9,896	8,404
Internal Labor	-	157	2,517	3,171	2,604
Total	**$ -**	**$ 2,716**	**$ 12,733**	**$ 14,167**	**$ 12,108**

Forecasted Years: 2030-2034						
Cost Category	2030	2031	2032	2033	2034	**Total**
Software	$ 864	$ 748	$ -	$ -	$ -	**$ 4,132**
External Labor	2,279	2,279	-	-	-	**35,314**
Internal Labor	365	365	-	-	323	**9,501**
Total	**$ 3,509**	**$ 3,392**	**$ -**	**$ -**	**$ 323**	**$ 48,947**

The total forecast for Software is $4.132 million. These costs include cloud subscription fees and server licensing for development and test environments supporting the data transformation platform hosted in a cloud environment. This platform will function as the intermediary between the AMI Core Systems and the Connected AMI Systems, translating the data structure to minimize the remediation efforts required for reconnection of the Connected AMI Systems. Subscription and licensing fee estimates were based on comparable work performed for a recent company project. Software costs are projected to occur from 2027 through 2031.

The total forecast for External Labor is $35.314 million which includes third-party contractor costs, including a SI Vendor and software vendors providing professional services to customize applications, develop data interfaces, and reintegrate Connected AMI Systems with the AMIR platform.

1. <u>SI Vendor – $28.175 million</u>: This forecast includes cost to develop the data-transformation platform and to reintegrate the HeadEnd System and the MDM System with the Connected AMI Systems. The SI Vendor cost forecast applies the same methodology as described for the HeadEnd System, utilizing vendor proposals, SME input, and an allocation of labor hours across workstreams using a blended billing rate. SoCalGas allocated 111,250 hours to the Connected AMI Systems workstream. SI vendor costs are projected to occur from 2026 through 2029.

2. Software Vendor Customization – $3.864 million: This forecast includes costs from multiple software vendors to perform SoCalGas specific software customizations. These customizations include updates to SAP (asset management and customer information system), IFS (core meter work order system), and Click (non-core meter and instrument work order system). The forecast was based on comparable work for a recent company project as a baseline and was subsequently adjusted by SoCalGas SMEs to reflect differences in project complexity. Software vendor customization costs are expected to occur from 2027 through 2031.

3. Software Vendor Modification and Support – $3.275 million: This forecast includes costs to modify and support required changes to approximately half of the Connected AMI Systems. The forecast was based on comparable work for a recent company project as a baseline and was subsequently adjusted by SoCalGas SMEs to reflect differences in project complexity. Software vendor modification and support costs are projected to occur from 2027 through 2029.

The total forecast for Internal Labor is $9.501 million for AMIR project personnel to manage the integration workstream and company SMEs to support, test, and validate reintegration with the Connected AMI Systems. The cost forecast was developed using comparable work for a recent company project, as well as SoCalGas SME input, to create estimates for each of the 20 interface types. Key cost drivers for each interface type include: (1) the type of the system call, (2) payload size, (3) the complexity and number of fields. Approximately 119,300 hours were projected for these activities. Internal labor was allocated by year to align with the project schedule, with approximately 90 percent of the hours projected from 2027 through 2029.

(5) Connected Deployment Systems

SoCalGas is requesting $1.980 million in direct O&M costs and $20.834 million in direct capital costs, totaling $22.814 million in direct costs to modify the Connected Deployment Systems as needed to support module deployment. Table III-19 below provides the Connected Deployment Systems costs by cost type (O&M and capital). Table III-20 below summarizes the

Connected Deployment Systems costs by cost category. Additional detailed cost information and assumptions can be found in my supporting workpapers (SCG-III-WP, WP3-07).

Table III-19
Connected Deployment Systems Total Costs by Year
In 2025 $ (000s)

Forecasted Years: 2025-2029					
Cost Type	2025	2026	2027	2028	2029
O&M	$ -	$ -	$ -	$ -	$ -
Capital	-	-	2,084	6,050	4,597
Total	**$ -**	**$ -**	**$ 2,084**	**$ 6,050**	**$ 4,597**

Forecasted Years: 2030-2034						
Cost Type	2030	2031	2032	2033	2034	**Total**
O&M	$ 264	$ 264	$ 484	$ 484	$ 484	**$ 1,980**
Capital	2,838	1,642	1,616	1,348	657	**20,834**
Total	**$ 3,102**	**$ 1,906**	**$ 2,100**	**$ 1,832**	**$ 1,141**	**$ 22,814**

Table III-20
Connected Deployment System Total Costs by Cost Category
In 2025 $ (000s)

Forecasted Years: 2025-2029					
Cost Category	2025	2026	2027	2028	2029
Equipment and Software	$ -	$ -	$ 126	$ 1,398	$ 553
External Labor	-	-	1,308	3,732	3,104
Internal Labor	-	-	650	920	941
Total	**$ -**	**$ -**	**$ 2,084**	**$ 6,050**	**$ 4,597**

Forecasted Years: 2030-2034						
Cost Category	2030	2031	2032	2033	2034	**Total**
Equipment and Software	$ 1,761	$ 1,244	$ 1,219	$ 951	$ 260	**$ 7,513**
External Labor	964	285	285	285	285	**10,246**
Internal Labor	377	377	597	597	597	**5,055**
Total	**$ 3,102**	**$ 1,906**	**$ 2,100**	**$ 1,832**	**$ 1,141**	**$ 22,814**

The total forecast for Equipment and Software is $7.513 million. These costs include all equipment and software-related costs required to support module deployment. This forecast includes equipment, software licensing, software customization, and data storage. All software costs below were based on current pricing contracts between SoCalGas and its software vendors.

1. Software Licensing Costs – $3.154 million: This forecast includes license costs for (1) Mobile Workforce Management System, (2) Planning Scheduling Optimization tool, and (3) Dispatch System. The forecast is based on a per-user (field technician) licensing fee. Software licensing costs are projected to begin in 2029 with approximately 30 users, scale to over 500 users by 2031, and then decline to approximately 75 users by 2034 as the number of field technicians decreases.
2. Subscription and Software Fees - $1.981 million: This forecast is primarily for subscription fees for development, QA, and performance-testing environments, as well as software costs for a data simulator. The forecast for subscription fees is based on a per-unit cost and software costs were based on an annual licensing cost. Subscription and software fees are projected to occur from 2027 through 2029.
3. Data Storage Costs – See Software Vendors below.
4. Route-Planning Software – $1.472 million: This forecast is for the purchase of new route planning software to support geographically clustered and efficient work routes for field technicians. Data storage costs are priced by annual licensing cost and are projected to occur from 2029 through 2034.
5. Handheld Device Equipment - $0.906 million: This forecast is for the purchase of handheld device equipment from the AMI Technology Vendor. This equipment will interface with the modules to execute activation and deactivation commands performed by field technicians. The forecast for equipment pricing is based on the RFP responses received from the competitive solicitation process after determining quantities required and applying per-unit pricing. Handheld devices are projected to be purchased at one time by 2030.

The total forecast for External Labor is $10.246 million which includes costs for professional services to make required modifications to Connected Deployment Systems. A forecast summary for each External Labor Vendor is provided below.

1. Customer Information Systems (CIS) Integration Vendor - $2.515 million: This forecast includes costs to modify the CIS system to accommodate AMIR-related work orders. The forecast is based on discussions with SoCalGas SME input. CIS Software vendor modification support costs are projected to occur from 2027 through 2029.
2. Software Vendors - $3.591 million: This forecast includes costs for services to perform requisite enhancements to the Mobile Workforce Management tool, Dispatch System, inventory management software, and Customer Contact Center enhancements and call storage. The forecast is based on vendor and SoCalGas SME input. Software vendor modification support costs are projected to occur from 2028 through 2029.
3. SI Vendor – $4.140 million: This forecast includes costs to support the planning and development of the data migration and interfaces between the AMI Core Systems and the Connected Deployment Systems. The SI Vendor cost forecast applies the same methodology as described for the HeadEnd System, utilizing vendor proposals, SME input, and allocation of labor hours across workstreams using a blended billing rate. SoCalGas allocated 16,000 hours to the Connected Deployment Systems SI workstream. SI vendor costs are projected to occur from 2027 through 2030, and then remaining services to maintain the system are projected to be performed from 2030 through 2034.

The total forecast for Internal Labor is $5.055 million to gather technical requirements and develop a deployment technology solution for Connected Deployment Systems. This includes labor to configure data exchanges and interfaces to support internal systems, and accommodate the new data required to meet system functionality. The forecast was developed using bottom-up cost estimating with SoCalGas SME input, informed by the initial AMI deployment, and comparable company projects. Approximately 29,400 hours are projected from 2027 through 2029 in support of the system planning, development, and testing activities, followed by approximately 27,000 hours forecasted from 2030 through 2034 for stabilization and maintenance through the end of deployment.

IV. AMIR PROJECT TECHNOLOGY TEAM ORGANIZATION AND ROADMAP

A. AMIR Project Technology Team

The AMIR Project Technology Team will provide the organizational structure and skilled resources necessary to execute the technology activities and deliver the roadmap described in Section IV.B. This team structure will support the delivery of a coordinated technology implementation.

The AMIR Project Technology Team will consist of employees with expertise in AMI operations, IT integration, data management and governance, project management, and connected enterprise systems. SoCalGas will leverage experience gained from the implementation of the existing AMI system as well as other comparable projects, to guide design decisions, data-conversion activities, and vendor coordination. At the peak, more than 85 project team members are expected to support the technology activities for the project, including system, network and domain architects, IT specialists, product owners, scrum masters, business analysts, testers, and change management professionals. The AMIR Project Technology Team will facilitate knowledge transfer and business process alignment to deliver continued performance of the AMIR Project once deployed.

A project of this size requires specialized vendor expertise. SoCalGas will employ a multi-vendor strategy through competitive solicitation processes to maximize technical competence and cost efficiency.

The AMIR Project Technology Team will be organized by workstream as follows:

- <u>Functional Teams</u> - responsible for overall solution strategy, architecture, business process design, data governance, and cybersecurity. Functional teams will also be responsible for vendor selections, proof of concepts, vendor demonstrations, vendor technology management, and oversight of all systems in scope (*see* Figure III-1).
- <u>Technical Teams</u> – responsible for all technology and systems, including middleware, system integrators, AMI Technology Vendor, requirements gathering, security strategy and execution, data cleansing and conversion, data transformation services execution, connected systems remediations, decommissioning approach, and cloud implementation.
- <u>Testing Teams</u> – responsible for technology component testing including system integration testing, environment testing, user acceptance testing, regression

testing, and performance testing, including validation of data migration and business processes.

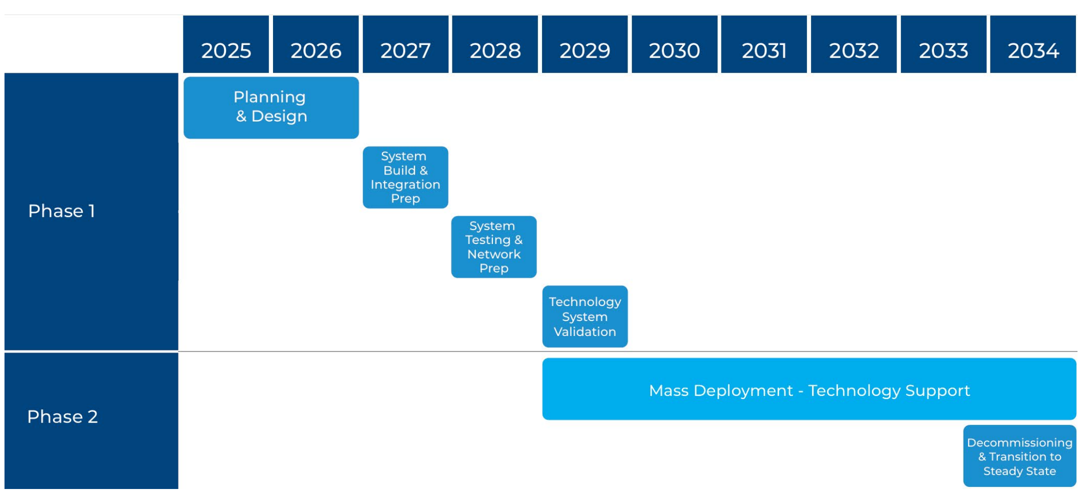
- Organizational Readiness Team – responsible for the people, processes, and supporting functions required to adopt and sustain the new technologies, systems, and business impact and processes.
- Security Team – responsible for security strategy, security implementation and penetration testing, user access roles, procedures to protect company equipment and user data, and vendor product testing.
- Technology Decommissioning Team – responsible for the retirement of legacy systems and network equipment.

Each technology workstream will have defined deliverables, milestones, and performance metrics, with periodic reviews to assess progress. The AMIR Project Technology Team will report project status updates to the AMIR Project Management Office (PMO), which will provide overall governance, coordination, and oversight of all workstream activities. For more details regarding the PMO, refer to the Direct Testimony of Linden S. Olah (Chapter IV).

B. AMIR Project Technology Roadmap (2025 – 2034)

The AMIR technology roadmap defines two primary phases of implementation: (1) technology planning, build, and testing (2025-2029); and (2) mass deployment and decommissioning (2030-2034). This phased approach supports operational continuity, system reliability, and cybersecurity needs throughout the transition from the existing AMI system to the replacement platform, while maintaining data integrity and the AMI benefits described in the Direct Testimony of Jennifer L. Walker (Chapter I).

Figure III-3
AMIR Technology Roadmap and Timeline
2025 – 2034



1. Phase 1: Technology Planning, Build, and Testing (2025 – 2029)

a. 2025 – 2026 – Planning and Design

The planning years of the AMIR Project will be focused on finalizing vendor selection, executing third-party contracts, and establishing the technology program management team and structure. During this period, SoCalGas will complete detailed architecture and design activities for the AMI Core Systems (the HeadEnd System, the MDM System, and the NEMO System). Key activities include:

- Finalizing system requirements and data architecture based on RFP vendor inputs and internal SME review;
- Coordinating design alignment across dependent enterprise systems and other concurrent IT programs;
- Defining the cloud-hosting environment and cybersecurity framework consistent with SoCalGas's IT standards; and
- Developing the detailed schedule and associated costs.

This period will be the foundation for determining the final cloud configuration standards, sequencing for integration testing, and identification of systems requiring remediation to interface with the new AMI platform.

b. 2027 – System Build and Integration Preparation

In 2027, SoCalGas and selected consultants will begin configuration and development of the new AMI Core Systems. The HeadEnd System and the MDM System will be implemented on a cloud platform and integrated with internal systems to establish the data flow between the Communication Network and SoCalGas Systems. Key activities include:

- A structured remediation plan which will proceed along with architecture and design of a data transformation platform to mitigate system impacts of Connected Systems. Connected Systems vendors and relevant SoCalGas departments will be engaged to progress interface development and data alignment;
- Configuration and customization of vendor software;
- Development of Application Programming Interfaces and other types of data exchanges to re-establish data flow between the AMI Core Systems and Connected Systems;
- System modifications and solution development to support work dispatching, routing, and work order application and management in support of the deployment workforce;
- An RFP will be issued to evaluate the landscape and select a vendor for the NEMO System;

- Initial setup of the AMI Core Systems, including detailed requirements; and
- Preparation for propagation modeling and network design for replacement Communication Network.

c. 2028 – System Integration Testing and Network Preparation

In 2028, focus shifts to comprehensive system integration and validation testing. The network installation vendor will be selected and support endpoint propagation modeling and preliminary equipment procurement. Key activities include:

- Test completion of the HeadEnd System and the MDM System;
- Integration testing with customer billing, field work management, and data analytics platforms;
- Development and testing of the NEMO System and Connected Deployment System;
- RFP to select a network deployment vendor;
- Execution of cybersecurity and privacy validation reviews;
- Completion of deployment-support applications and call-center systems required for the module replacement rollout; and
- System and integration work to support the AMIR deployment to allow for full regression testing of these systems and functionality in 2029.

d. 2029 – Technology System Validation

The 2029 project year serves as a bridge between system build and field deployment. Evaluate and validate the data transfer and end-to-end system performance of approximately 25,000 modules to establish readiness for full deployment.[10] Key activities include:

- Data validation of network performance and module communication;
- Parallel operations of the legacy and new AMI systems to confirm data consistency and billing efficiency;
- Final adjustments to Connected Deployment Systems, workforce scheduling tools, and reporting interfaces;
- End-to-end regression testing of the AMI ecosystem including downstream connected systems; and
- Performance testing for cloud software systems.

[10] For more information regarding field deployment, refer to the Direct Testimony of Linden S. Olah (Chapter IV).

2. Phase 2: Technology Support for Mass Deployment and Network Equipment Decommissioning (2029 – 2034)

a. 2029 – 2034 – Technology Support for Mass Deployment

Following successful technology system validation completion in 2029, SoCalGas will conduct the full five-year mass deployment of over 6 million modules. Key technology activities include:

- Data flow and functional validation for replaced AMI system
- Coordinating network deployment with geographically phased module deployment;
- Maintaining dual-system operation to maintain uninterrupted billing and data collection;
- Continuous performance monitoring through the NEMO System analytics dashboards; and
- Transitioning completed regions to steady-state operations and initiating legacy system decommissioning in corresponding areas.

b. 2034 – Network Equipment Decommissioning and Transition to Steady State

Upon completion of deployment, SoCalGas will retire legacy AMI network systems. Key technology activities include:

- Full cutover to the new AMI platform for all customers;
- Decommissioning of obsolete network equipment;
- Transfer of responsibility to relevant SoCalGas teams; and

V. CONCLUSION

The technology components and activities described in my testimony form the core of the AMIR Project. These replacements, including the Endpoints, the Communication Network, SoCalGas Systems (e.g., the HeadEnd System, the MDM System, and the NEMO System), and Connected Systems (e.g., AMI Support Systems, and Connected Deployment Systems) are essential to maintain the functionality, reliability, and cybersecurity of SoCalGas's AMI platform. The cost forecasts, technology team organization, and implementation approach provide a prudent and cost-efficient plan for achieving this systemwide replacement.

This concludes my prepared direct testimony.

VI. WITNESS QUALIFICATIONS

My name is Amy D. Vulin. I am employed by Southern California Gas Company (SoCalGas), and my current position is Group Product Manager within the Customer Systems and Technology department where I have overall responsibility for the planning, organization and execution of the technology portion of the AMIR Project. My business address is 555 West Fifth Street, Los Angeles, CA 90013. I have over 20 years of experience with SoCalGas utility operations and technology. At SoCalGas I have held a variety of management positions in Advanced Meter Operations, Customer Service Field Technology, and Customer Strategy. Prior to joining SoCalGas, I worked for Bonterra Consulting and the City of Huntington Beach. I have a bachelor's degree in Geography and GIS from California State University at Long Beach. I have not previously testified before the Commission.