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Application: A.22-05-015 /-016 (consolidated)
Exhibit: SCG-221

**REBUTTAL TESTIMONY OF
BEN GORDON AND WILLIAM J. EXON
INFORMATION TECHNOLOGY**

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



May 2023

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**REBUTTAL TESTIMONY OF
BEN GORDON AND WILLIAM J. EXON
(INFORMATION TECHNOLOGY)**

I. SUMMARY OF DIFFERENCES

TOTAL O&M - Constant 2021 (\$000)			
	Base Year 2021	Test Year 2024	Change
SOCALGAS	49,709	57,234	7,525
CAL ADVOCATES	49,709	57,234	7,525

TOTAL CAPITAL - Constant 2021 (\$000)					
	2022	2023	2024	Total	Difference
SOCALGAS	253,159	229,046	174,827	657,032	NA
CAL ADVOCATES	247,991	186,164	152,265	586,420	(70,612)
TURN	244,883	204,626	146,907	596,416	(60,616)

II. INTRODUCTION

This rebuttal testimony (1) adopts the direct testimony of Tia Ballard and Operations and Maintenance (O&M) work papers supporting Southern California Gas Company’s (SoCalGas’s) request for Information Technology (IT) (O&M) costs,¹ and (2) addresses the following testimony from other parties:

- The Public Advocates Office of the California Public Utilities Commission (Cal Advocates) as submitted by L. Mark Waterworth (Exhibit CA-11), dated March 27, 2023.
- The Utility Reform Network (TURN), as submitted by David Cheng (Exhibit TURN-09), dated March 27, 2023.

As a preliminary matter, the absence of a response to any particular issue in this rebuttal testimony does not imply or constitute agreement by SoCalGas with the proposal or contention made by these or other parties. The forecasts contained in SoCalGas’s direct testimony,

¹ Ex. SCG-21-R (Revised Direct Testimony of Tia Ballard, Chapter 2, O&M Information Technology) August 2022 and Ex. SCG-21-WP-R (Revised Workpapers to Prepared Direct Testimony of Tia Ballard), August 2022), adopted by William Exon.

1 performed at the project level, are based on sound estimates of its revenue requirements at the
2 time of testimony preparation.

3 No party has taken issue with SoCalGas's IT O&M forecasts. This rebuttal testimony
4 will address intervenors' testimony on the key areas summarized below:

5 **A. Cal Advocates²**

6 The following is a summary of Cal Advocates' position on the IT Capital forecasts:³

- 7 • Cal Advocates does not take issue with SoCalGas's TY 2024 Shared and Non-
8 Shared Services O&M forecast of \$57,235 million.
- 9 • Opposes the Systems Applications Products (SAP) Transformation Project based
10 on its assertion that project cost estimates were poorly supported, inadequate
11 business justification provided and Cal Advocates' expectation that the project
12 will be completed in the post test year period, which results in the following
13 reductions to the Capital forecast:
 - 14 ○ A forecast of \$247.991 million for 2022 IT Capital expenditures, a
15 reduction of \$5.168 million from SoCalGas's forecast of \$253,159
16 million.
 - 17 ○ A forecast of \$186.164 million for 2023 IT Capital expenditures, a
18 reduction of \$42.882 million from SoCalGas's forecast of \$229.046

² As an initial note, Cal Advocates asserts that it "experienced unnecessary delays in analyzing and evaluating SCG's and SDG&E's IT capital projects because the support and detailed breakdown of all costs for the projects were included in separate exhibits from the project justifications." (Ex. CA-14 (Testimony of Refat Amin), March 27, 2023, at 4, fn. 9.) Cal Advocates then asks the Commission to order the Applicants to include the support and justification details in one place for ease of Cal Advocates review in future GRCs. SoCalGas disagrees that the relief Cal Advocates is necessary or warranted. Applicants' testimony is structured and provided by the witness that has knowledge of and is sponsoring the proposal and can attest to its accuracy. Business witnesses cover the business need of a proposed project because they are the subject matter expert for their business areas requirements and objectives, while the IT witness can attest to the technical justification and the costs and attributes of the associated project that the IT organization handles to develop, build, and implement. SoCalGas has structured its testimony in this manner in its previous GRCs without objection. Nor is there any prejudice to parties in having projects supported by the witness areas that possess the relevant evidence. In this GRC, Cal Advocates had 10 months from the time the Application was filed to the date of its testimony to analyze and evaluate Applicants' IT projects. More time was afforded in this proceeding than contemplated by even the Commission in its Rate Case Plan decision. (See D.20-01-002, Appendix B (Schedule for the Transition from the Current Three-Year GRC Cycle to the Four-Year GRC Cycle).) Cal Advocates' request should be rejected.

³ Ex. CA-11 (Testimony of L. Mark Waterworth on behalf of Cal Advocates), March 27, 2023, at 56-70.

1 million.

- 2 ○ A forecast \$152.265 million for 2024 IT Capital expenditures, a reduction
3 of \$22.562 million from SoCalGas's forecast of \$174.827 million.

4 **B. TURN**

5 The following is a summary of TURN's position on the IT Capital forecasts:⁴

- 6 • TURN does not take issue with SoCalGas's TY 2024 Shared and Non-Shared
7 Services O&M forecast of \$57.232 million.
- 8 • Opposes the Customer Contact Center (CCC) Technology Modernization Capital
9 forecast based on assertion project was insufficiently justified, a reduction of
10 \$15.906 during the GRC cycle.⁵
- 11 • Opposes the Advanced Meter Head End and Meter Data Management Next-
12 Generation project's capital forecast based on assertion project was insufficiently
13 justified, a reduction of \$28.832 in 2024.⁶
- 14 • Opposes the Field Portable Automated Centralized Electronic Retrieval workforce
15 management (PACER WFM) system (PACER WFM), replacement based on its
16 assertion project was insufficiently justified, a reduction of \$7.024 million in
17 2022, \$11.907million in 2023, and \$13.773 million in 2024.⁷

18 **III. GENERAL REBUTTAL**

- 19 • SoCalGas prudently manages its business to meet the needs and demands of the
20 business and its customers, recognizing that its technology and systems have a
21 lifecycle. As these demands and requirements evolve, SoCalGas addresses these
22 changes and accompanying technology needs through the vetting and rigor of its
23 technology selection, design, and testing processes on the front end,⁸ and by its
24 actions upon implementation to regularly update and maintain that technology to
25 maximize its lifespan. SoCalGas invests in modern technologies as technology

⁴ Ex. TURN-09 (Cheng) at 13-14.

⁵ *Id.*

⁶ *Id.* at 14-16.

⁷ *Id.* at 3, 8-10.

⁸ See Ex. SCG-21-R (Prepared Direct Testimony of Ben W. Gordon, Tia L, Ballard, and William J. Exon) August 2022, at TLB/WJE-6, TLB/WJE-24.

1 evolves, such as Cloud, machine learning, and artificial intelligence, to streamline
2 operations, increase performance, and provide our customers with innovative,
3 digital solutions and insights. SoCalGas strategically and thoughtfully selects IT
4 investments with the intention of improving safety, reliability, and efficiency for
5 our customers not limited to a specific time-period.

- 6 • Technology, like many industries, is subject to obsolescence, which means
7 SoCalGas must update, maintain, and, when the time comes, replace that
8 technology. As technology industry expert Gartner notes, “All technology
9 becomes obsolete and unsupported over time. Unsupported systems do not
10 receive bug fixes, enhancements, and, most importantly, security patches —
11 significantly increasing the risk of system compromise.”⁹ The failure to address
12 technology obsolescence also increases the risk of unauthorized access to
13 SoCalGas confidential assets and customer data due to cybersecurity
14 vulnerabilities in outdated technology. As noted by the United States Department
15 of Homeland Security’s Cybersecurity and Infrastructure Security Agency
16 (CISA), “Use of unsupported (or end-of-life) software in service of Critical
17 Infrastructure and National Critical Functions is dangerous and significantly
18 elevates risk to national security, national economic security, and national public
19 health and safety. This dangerous practice is especially egregious in technologies
20 accessible from the Internet.”¹⁰
- 21 • The Capital projects addressed in SoCalGas’s direct testimony and in this rebuttal
22 are required to remediate risks to SoCalGas’s business operations and critical
23 system infrastructure so that SoCalGas can seamlessly, efficiently, safely, and
24 securely provide its business and its customers with the services they deserve and
25 expect without the risks created by technology that has reached the end of its
26 useful life or is no longer supported by its vendor.

⁹ Appendix C (Gartner, *Securing End-of-Support Production Systems*, March 15, 2023) at 2.

¹⁰ Appendix D (U.S. Dept. of Homeland Security, CISA, *Bad Practices*) at 2.

1 **IV. REBUTTAL TO PARTIES' CAPITAL PROPOSALS**

TOTAL CAPITAL - Constant 2021 (\$000)					
	2022	2023	2024	Total	Difference
SOCALGAS	253,159	229,046	174,827	657,032	N/A
CAL ADVOCATES	247,991	186,164	152,265	586,420	(70,612)
TURN	244,883	204,626	146,907	596,416	(60,616)

2
3 **A. SAP TRANSFORMATION PROJECT (WP# 00756L)**

4 **1. CAL ADVOCATES**

5 Cal Advocates opposes the SAP Transformation project in its entirety and proposes a
6 reduction in the IT Capital forecast of approximately \$71 million based on its assertion that the
7 project cost estimates and business justification provided by SoCalGas were inadequately
8 supported.¹¹ Cal Advocates also states that it “takes issue with whether the timeline for project
9 completion is reasonable.”¹² Even though the timeline that SoCalGas provided (and is contained
10 in Cal Advocates’ testimony) shows that the SAP Transformation Project is slated for
11 completion in 2024,¹³ Cal Advocates postulates, without evidence, that the project will not be
12 completed in its entirety until after the post-test year period.¹⁴ Cal Advocates is incorrect in its
13 assessment.

14 **a. Business Justification and Costs**

15 The SAP Transformation project is the first phase of SoCalGas’s upgrade of its current
16 SAP platform, which has been in place since 1999. The first phase of the SAP IT
17 Transformation is to lay the technical foundation by upgrading the existing SAP platform to the
18 latest version. The forecasted costs of the SAP Transformation project are for a critical system
19 upgrade that is necessary because the vendor (SAP) has announced end of life in 2027 for the
20 current SAP ECC platform version that it will no longer support. The Administrative and
21 General (A&G) direct and rebuttal testimony of Sara Mijares (Exhibit SCG-29-R; Exhibit SCG-
22 229) provides the business justification and a detailed explanation regarding the importance of
23 this accounting system that is the backbone of financial reporting for SoCalGas, SDG&E, and

¹¹ Ex. CA-11 (Waterworth) at 63-64.

¹² *Id.* at 65.

¹³ *Id.*; see also Figure WE-1, SAP Transformation Project, below.

¹⁴ Ex. CA-11 (Waterworth) at 62.

1 Sempra Corporate Center and the risks of using an unsupported system. This project provides
2 the initial step in the replacement of the ECC platform and secondarily provides a technical
3 upgrade that will significantly improve system functionality. By moving to the latest technology
4 for this platform, the SAP Technology project 1) provides the foundation to facilitates innovative
5 advancements and benefits; and 2) advances digitalization benefits that will increase efficiency,
6 system performance, manage cybersecurity risk, increase speed, and deliver innovative solutions
7 and insights. In addition to the accounting functions, this system also provides support for
8 regulatory and compliance-related processes, promoting safety and reliability through better
9 reporting capability, accurate accounting, better planning, and accuracy for work execution in the
10 field. In the next GRC, there will be a follow-up phase that will focus on the business
11 transformation providing end-user efficiencies, improved financial reporting, shorter closing
12 cycles, enhanced financial tracking, and access to the latest SAP business capabilities.

13 As described in testimony,¹⁵ SAP provides software and technology solutions for
14 businesses worldwide and is the financial system used by both SoCalGas's and SDG&E's
15 finance and accounting organizations. The SAP Transformation Project addresses necessary
16 system upgrades, cybersecurity risk mitigation, and system modifications to support changing
17 business processes, and maintenance of core technology systems, including those used by
18 Accounting & Finance, Work Management, Construction Planning & Design (CPD), and
19 Materials Management. The SAP platform supports more than the accounting systems at both
20 SoCalGas and SDG&E and is utilized to help maintain the entire gas and electric distribution
21 construction work management lifecycle, either directly or indirectly via an interface, including
22 Planning, Design, Scheduling, Job reconciliation, and Accounting for construction work
23 management. This includes short-cycle, long-cycle, and emergency-related work orders. In
24 addition to supporting operational and accounting functions, these systems also provide support
25 for regulatory and compliance-related processes, thereby promoting safety and reliability through
26 better reporting capability, accurate accounting, better planning, and accuracy for work execution
27 in the field.

28 Cal Advocates reviewed a selection of the 19 largest IT projects proposed in SoCalGas's
29 Application and described in SoCalGas's testimony and workpapers. Despite the supporting

¹⁵ See Ex. SCG-29-R (Revised Prepared Direct Testimony of Sara P. Mijares (Administrative and General) at SPM-59 – SPM-61.

1 materials SoCalGas provided on these projects, including a discussion of SoCalGas’s IT Capital
 2 request, the process for project review, development of a business case and cost estimates, and
 3 detailed data request responses,¹⁶ Cal Advocates asserts that SoCalGas provided inadequate
 4 support for its cost estimates.¹⁷ Cal Advocates now recommends the disallowance of all capital
 5 costs for the SAP Transformation project. Cal Advocates states: “SCG also failed to provide
 6 calculations supporting the determination of those amounts.”¹⁸ SoCalGas disagrees with that
 7 assertion. SoCalGas explained to Cal Advocates in data request responses and verbally that it’s
 8 estimates are based on the input of subject matter experts who have executed thousands of IT
 9 projects, and, where available, on the results of the competitive Requests for Proposals (the RFP)
 10 process that has or will occur for each phase of the project development, and provided the
 11 breakdown of forecasted labor and non-labor costs for the project.¹⁹ That information and the
 12 work papers provided Cal Advocates with the data used to build SoCalGas’s forecast for the
 13 project.

14 Table WE-1, below, also demonstrates how the estimated costs are broken out by phase,
 15 peaking in 2023 and ramping down in 2024, as the project focuses on final testing and
 16 confirmation.

17 **Table WE – 1**

SAP TRANSFORMATION CAPITAL PROJECT FORECAST COSTS					
In 2022 \$000,000					
Activity	Cost Type	2022	2023	2024	Total
<i>Blueprint Phase</i>					
	Vendor Services	0.5	0	0	0.5
	Labor	0.2	0	0	0.2
<i>High Level Architecture</i>					
	Vendor Services	2.5	0	0	2.5
	Labor	1.0	0	0	1.0
	Hardware	1.0	0.3	0	1.3
<i>Detailed Requirements</i>					
	Vendor Services	0	5.0	0	5.0

¹⁶ See Appendix B, SoCalGas Response to TURN-SEU-064, Question 1b.

¹⁷ Ex. CA-11 (Waterworth) at 62.

¹⁸ *Id.* at 63.

¹⁹ See, e.g., Appendix B, an excerpt from SoCalGas Response to PubAdv-SCG-026-LMW, Question 1a; Ex. SCG-024-CWP-R (Revised Capital Workpapers to Prepared Direct Testimony of William J. Exon), September 2022.

SAP TRANSFORMATION CAPITAL PROJECT FORECAST COSTS					
In 2022 \$000,000					
Activity	Cost Type	2022	2023	2024	Total
	Labor	0	1.5	0	1.5
<i>Detail Design/Configuration</i>					
Impacts: ~ 12 SAP modules ~ 118 integrated systems ~ 417 interfaces					
	Vendor Services	0	17.0	0	17.0
	Labor	0	1.0	0	1.0
	Software	0	18.0	0	18.0
<i>Implementation</i>					
Impacts: ~ 12 SAP modules ~ 118 integrated systems ~ 417 interfaces					
	Vendor Services	0	0	20.0	20.0
	Labor	0	0	2.5	2.5
TOTAL		5.2	42.8	\$22.5	\$70.5

b. Project Timeline

Cal Advocates claims, with no basis in fact, that the timeline for the SAP Transformation project is unachievable, and illogically equates execution of an IT project to a Real Estate project, stating that both are “subject to complications and delay.”²⁰ Cal Advocates then attempts to link nine generic examples of delays that have no bearing on the SAP Transformation project, implying that delay is inevitable because “SCG proposes starting and completing approximately over 120 projects with distinct ID’s and descriptions.”²¹ Specifically, and with no evidence that any of any of these conditions are likely to encumber the SAP Transformation project, Cal Advocates infers that the following conditions will apply in SoCalGas’s situation:

- Insufficient staffing or availability of resources,
- Poor quality control and design,
- Overly optimistic schedules,
- Too many projects at the same time,
- Changes in scope and technology advances,

²⁰ Ex. CA-11 (Waterworth) at 65.

²¹ *Id.*

- 1 • Ambiguous specifications,
- 2 • Poor project management,
- 3 • Supplier issues,
- 4 • Coordination between parties.²²

5 Aside from reflecting a large number of prospective IT projects, Cal Advocates provides
6 no basis to assert that any of these “conditions” will impact the SAP Transformation project.
7 SoCalGas provided the timeline for this project, which Cal Advocates included in its testimony
8 as Table 11-33,²³ which shows project is on track to meet its closing milestone in the last quarter
9 of 2024.

10 Cal Advocates’ apparent assertion that SoCalGas cannot timely complete its projects is
11 unfounded. As described in testimony, and outlined below, SoCalGas undertakes a thorough and
12 thoughtful agile process when considering a technology project and the careful development of
13 project milestones.²⁴ The project proceeds on a path to development, design, build, and
14 implementation after engaging a project team that includes IT personnel, business stakeholders,
15 and other necessary subject matter experts, including procurement personnel. In addition,
16 Project management leadership is responsible for establishing and implementing best practices,
17 business and quality control processes, and guiding the project through completion in accordance
18 with the schedule established for the project, using guiding principles and governance gates, such
19 as the SAP Center of Excellence and Executive Steering Committee and Business
20 Controls/Quality Group, to ensure sound business decisions and quality solutions.

21 SoCalGas follows a six-step process in the design and development of IT projects,
22 implementing a risk avoidance strategy that employs a comprehensive end-to-end view of the
23 SAP landscape, high-level architecture, identifies potential impact areas and takes action to
24 mitigate potential delays proactively. The six-step process, which occurs in phases, that
25 SoCalGas employs to design and execute IT projects is described below:

- 26 1. **Discover Phase:** Focuses on identifying all components for the technology
27 system, and begins to define what is in scope from various aspects including built-

²² *Id.* at 65-66.

²³ *Id.* at 65.

²⁴ Ex. SCG-21-R (Gordon, Ballard, and Exon) at 24-25.

1 in modules, applications, interfaces, databases, interfacing third party systems,
2 functional components, and other items that make up the entire project (here,
3 SAP) ecosystem. The final product of this phase is generally known as the
4 ‘blueprint.’

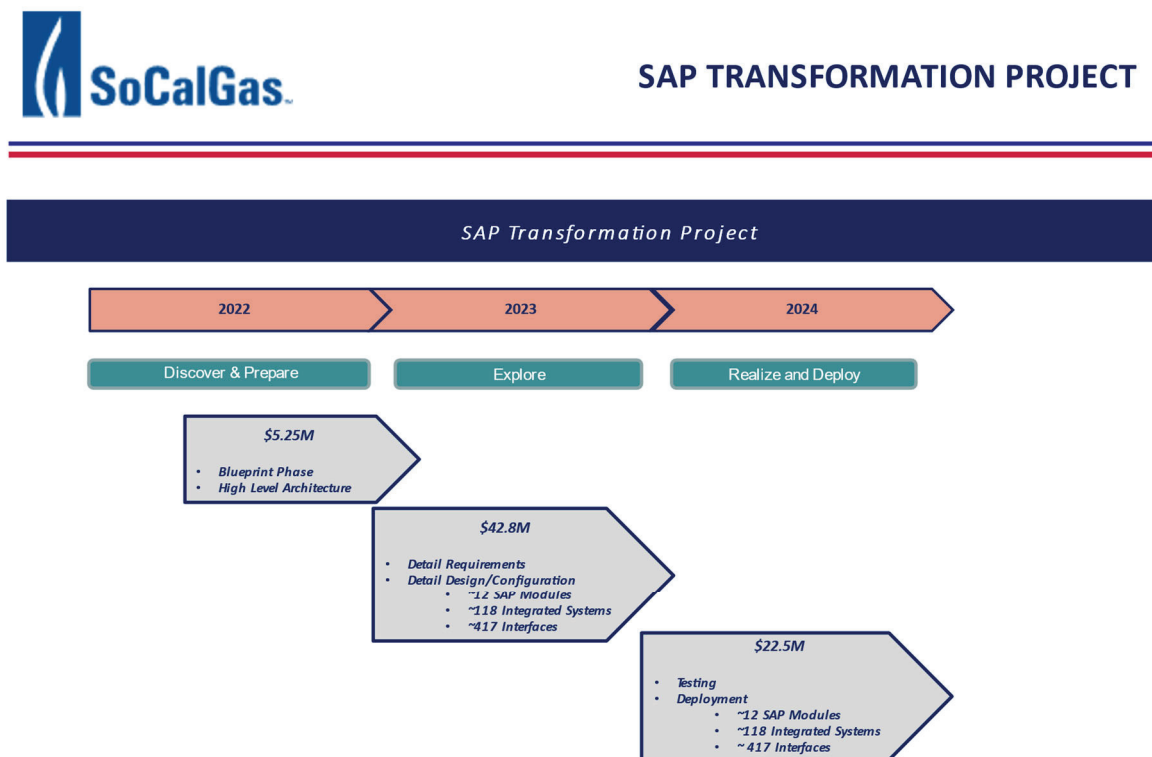
- 5 2. **Prepare Phase:** Uses the output of the Discover Phase (blueprint) to refine,
6 validate, and launch the preparedness activities. It is in this phase that the
7 business case is produced for review and approval. As part of the readiness
8 activities, the RFP for System Integration is also created and sent to potential
9 vendors. Where a project is complex and may have a significant business impact,
10 the Organizational Change Management (OCM) team is also initiated during this
11 phase.
- 12 3. **Explore Phase:** The most important activity during the Explore Phase is the
13 design activities and artifact creation, which relies on the blueprint as input. The
14 artifact describes the “what and the how” for a project and serves as the
15 “cookbook” for the Realize Phase and ultimate execution of the solution.
- 16 4. **Realize Phase:** Project execution is initiated here and includes configuration
17 changes and application of business rules. Interfaces between other systems and
18 the project and database are created. All components identified in the Design are
19 created, configured, and refined, where necessary, for deployment.
- 20 5. **Deploy Phase:** The technology solution is tested to ensure it will meet the
21 business and technical objectives for the project. From performance to functional
22 use cases, all aspects of the solution are tested and readied for deployment. The
23 actual delivery of the new solution and activities to transfer the solution into
24 business operations are the main deliverables of this phase.
- 25 6. **Closing Phase:** The period after project deployment that systems are being
26 monitored to ensure a smooth transition and end-user acceptance of the new
27 solution. Once the new solution is stabilized, project closure activities take place
28 as well. These activities could range from decommissioning legacy systems to
29 verifying interfaces are working as expected and databases and other technical
30 components are performing optimally. It also includes the dismantling of the

1 project team and full transition to the business support team that will operate or
2 use the new system.

3 SoCalGas initiated the Discovery phase of the SAP Transformation project in 2022. The
4 current status of the SAP Transformation project is on track and is finalizing the Prepare Phase in
5 readiness to move to the Explore Phase during Q2 in 2023. There are no known impediments
6 that threaten the schedule or timeline. Moreover, given that the vendor will no longer support
7 this system platform after 2027, SoCalGas is compelled to complete this project on time or risk
8 not having a replacement solution in place prior to 2027, and the risks attendant to having
9 technology that no longer has vendor support.

10 SoCalGas provides the following Gantt chart in Figure BG-WE-1 to depict the critical
11 milestones with forecasted spend by year and a high-level schedule of the work to be completed
12 for the SAP Transformation project.

13 **Figure 1 – WE**
14 **SAP Transformation Project**



1 In summary, the SAP Transformation Project is not a discretionary project. With SAP
2 ECC end-of-life in 2027, SoCalGas must commence this project during the 2024 GRC cycle, and
3 not the 2028 GRC due to the complexity, urgency, and resources needed to complete the
4 deployment of a new functioning SAP core system. As systems age, their reliability and
5 efficiency decrease, and the risk of system failure increases. Cybersecurity risk also increases
6 when a vendor no longer supports its technology with the regular updates, maintenance, and
7 security patches necessary to maximize the technology’s lifespan.²⁵ As technology expert
8 Gartner notes that “technology decisions are ever more consequential” in today’s rapidly
9 changing environments where utilities are challenged to “ensure the integrity of aging physical
10 infrastructure.”²⁶ SoCalGas has demonstrated that the SAP Replacement project is necessary for
11 the continued integrity of the Companies’ financial data, reporting, and gas and electric
12 operations scheduling.²⁷ Cal Advocates’ recommendation is not supported and should be
13 rejected. SoCalGas has shown that its forecast for the SAP Replacement project is reasonable
14 and should be adopted by the Commission in this TY2024 GRC.

15 **B. CCC Technology Modernization (WP# 00754V)**

16 **1. TURN**

17 TURN challenges the SoCalGas CCC Modernization Project. TURN asserts that “There
18 is no business case, no cost-benefit analysis, and no quantification of potential benefits.”²⁸
19 TURN requests that “the Commission [] reject the proposed CCC Modernization Project, and
20 the associated capital dollars should be removed from the GRC -- \$1.253 million in 2022,
21 \$12.512 million in 2023, and \$2.141 million in 2024.”²⁹

22 SoCalGas disagrees with TURN’s assertions, which fail to take into account the
23 information that SoCalGas has provided to support the need and justification for this project,
24 including the necessity for this system upgrade and the impact to SoCalGas business operations
25 and customer service should the project not be approved. The current Customer Contact Center

²⁵ See Section III, *supra*.

²⁶ Appendix C, Gartner, *Energy and Utilities Technology Optimization and Modernization Primer for 2023*, 2023.

²⁷ See Ex. SCG-229 (Mijares).

²⁸ Ex. TURN-09 (Cheng) at 13.

²⁹ *Id.* at 14.

1 (CCC) systems have nearly reached End-of-Life (EOL) and End-of-Support (EOS) stage, after
2 which time the vendors will not provide enhancements and support. The risks associated with
3 unsupported IT systems are described above in Section III, above, but it is worth repeating again
4 that there is an increased risk of cyber-attacks when systems go without patches to address newly
5 identified vulnerabilities, and customer service and the customers' experience is severely
6 compromised when intermittent downtime due to aging systems and unplanned incidents occur
7 and result in challenges taking and responding to customer calls. The current technologies such
8 as Avaya (voice), Genesys IVR (Interactive Voice Response), and NICE (Workforce
9 Management), that SCG uses to support its CCC are over a decade old and have limited
10 capabilities to address customer needs. Currently, Genesys on-site solutions are not being
11 enhanced beyond bug fixes and/or security updates. Genesys has focused their internal resources
12 on their Cloud product. CCotF is a project that will transfer and/or replace many of the CCC
13 legacy systems to a Cloud platform allowing for more frequent and quicker updates,
14 modifications, and enhancements to the CCC applications. Avaya, the contact center voice
15 system, has filed for Chapter 11 bankruptcy³⁰ and poses significant risk to keeping resilient
16 operations and viability of the product. The customer contact center Cloud platform will include
17 "Voice as a Service" and mitigate the risk of Avaya's viability as a Company and uncertainty.
18 The Customer Services – Office Operations direct and rebuttal testimony (Exhibit SCG-15;
19 Exhibit SCG-215) provides the business justification for the CCC Technology Modernization
20 project. The CCC Modernization project shifts the CCC systems to the Cloud in order to deliver
21 improved reliability, scalability, and security and reduce the risk of obsolescence. As a Cloud-
22 based solution, the CCC will further benefit from standardization and simplified architecture and
23 increase business agility and faster time to market to our customers while reducing maintenance
24 effort.

25 TURN claims that SoCalGas's support is "skimpy" and that it has failed to present clear
26 and convincing evidence that its capital spending for the CCC Technology Modernization project
27 is just and reasonable.³¹ SoCalGas disagrees with TURN's assessment. In addition to the details
28 provided in direct testimony (Exhibit SCG-21-R) and capital workpapers (Exhibit SCG-21-

³⁰ Reuters, *Avaya files for Chapter 11 bankruptcy*, February 14, 2023, <https://www.reuters.com/technology/avaya-files-chapter-11-bankruptcy-2023-02-14/>.

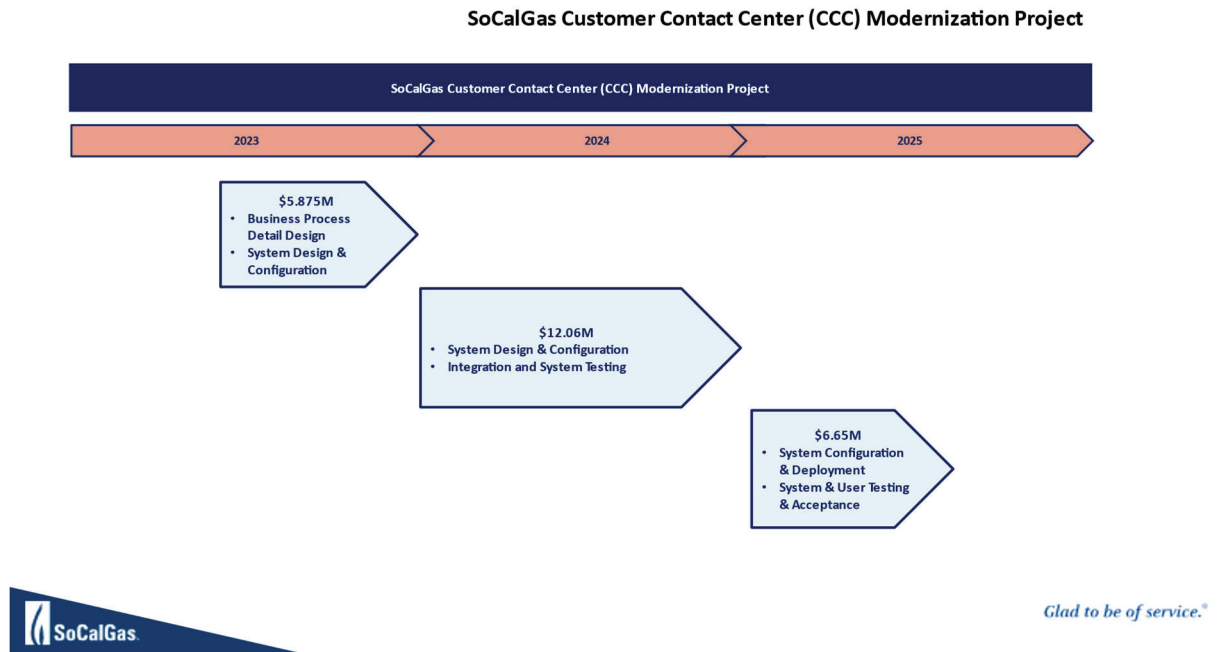
³¹ Ex. TURN-09 (Cheng) at 14.

1 CWP-R), SoCalGas has provided TURN with additional quantitative details about the project, as
2 they have progressed over the design and development process described above.³²

3 The details provided show the CCC Modernization project has progressed through the
4 business case and approval stages as SoCalGas progresses to the design phase of the project.
5 This project allows SoCalGas to avoid the business risks and system shortfalls described above
6 that the current aging system faces as it reaches its EOL and EOS stages, and should avoid future
7 costs that would be associated with paying for legacy system upgrades to keep an out-of-support
8 system functioning until another solution is approved, and provides a system that is more
9 responsive to business needs and efficiencies by moving the systems to the Cloud.³³

10 The trajectory of this project is further outlined in the following Gantt chart, which
11 depicts the critical milestones with forecasted spending by year and a high-level schedule of the
12 work to be completed for CCC Modernization Project.

13 **Figure 2 – WE-2**
14 **SoCalGas Customers Contact Center (CCC) Modernization Project**



15
³² See Discussion of six phases of SAP Transformation, above, at BG-WE-9 - BG-WE-10; Ex. SCG-21-R (Gordon, Ballard, and Exon); see also Appendix B, SoCalGas Responses to TURN-SEU-064, Question 1a, 1b and 1c.

³³ While benefits, such as cost savings and other avoided costs are anticipated for this project, those benefits will not be realized until the project has been placed into service.

1
2 TURN offers no alternative to this project if a solution for the nearing end of life and out
3 of support system is rejected, as it requests. And its lack of an alternative will default SoCalGas
4 into using an obsolete system with limited functionality and services to SoCalGas customers. If
5 TURN’s recommendation were adopted, SoCalGas will not have an operational Customer
6 Contact Center system that is critical for utilities, especially during emergency situations and to
7 aid in ensuring the safety of customers. This will result in higher costs to patch and loss of
8 productivity and will harm customers. For the reasons stated above, SoCalGas requests the
9 Commission reject TURN’s position and adopt SoCalGas’s forecast as reasonable.

10 **C. Advanced Meter Head End and Meter Data Management System Next-**
11 **Generation/AclaraONE (WP# 00754T)**

12 **1. TURN**

13 TURN challenges the SoCalGas Advance Meter Head End and Meter Data Management
14 System Next Generation (AclaraONE) IT Project and that the Commission reject the proposed
15 AclaraONE project and its associated capital dollars of (\$12.006 million in 2024 plus attrition
16 years).³⁴ TURN asserts that “There is no business case, no cost-benefit analysis, and no
17 quantification of potential benefits.”³⁵

18 SoCalGas disagrees with TURN’s assertions, which fail to consider the information that
19 SoCalGas has provided to support the need and justification for this project, including the
20 necessity for this system upgrade and the impact to SoCalGas business operations and customer
21 service should the project not be approved. TURN’s recommendation also fails to account for
22 the significant technology risks presented if the existing Aclara software is not up to date to the
23 latest version. Some of the critical technology capabilities in the latest version of AclaraONE is
24 end-to-end encryption to secure gas consumption data, support for upgraded Meter Transmission
25 Units, and methane and cathodic detection capabilities. Without an upgraded AclaraONE
26 system, there will be hefty maintenance cost of supporting aged onsite systems as the new Aclara
27 version (AclaraONE) is now Cloud-based and Aclara will not further support the onsite version
28 beyond bug fixes. As a result, many of the benefits attendant to using Advanced Meters will not

³⁴ Ex. TURN-09 (Cheng) at 14-16.

³⁵ *Id.* at 15.

1 be realized and SoCalGas will default to an aging Advanced Meter platform with limited
2 functionality and operability, resulting in potentially not being able to adjust to changing
3 business requirement and adapting to the increased customer expectations. The Customer
4 Services – Office Operations direct and rebuttal testimony (Exhibit SCG-29; Exhibit SCG-229)
5 provides the business justification for the AclaraONE, project.

6 TURN claims that SoCalGas’s support is “skimpy” and that it has failed to present clear
7 and convincing evidence that its capital spending for the AclaraONE project is just and
8 reasonable. SoCalGas disagrees with TURN’s assessment. In addition to the details provided in
9 direct testimony (Exhibit SCG-21-R) and capital workpapers (Exhibit SCG-21-CWP-R at 135),
10 SoCalGas has provided TURN with additional quantitative details about the project, as they have
11 progressed over the design and development process described above.³⁶

12 The details provided to TURN show the AM Next Gen (AclaraONE) project is currently
13 in the concept phase and the project team is assessing and developing the business case. While
14 the business and financial estimates are preliminary in nature, the data supports the proposed
15 project benefits, including avoidance of the business risks and system shortfalls described above
16 that the current aging system faces, and should avoid further costs that would be associated with
17 paying for legacy system upgrades to keep an out dated system functioning until another solution
18 is approved, and provide a system that is more responsive to business needs and efficiencies by
19 moving the systems to the Cloud .³⁷

20 As described above, the project will continue to undergo a rigorous process to confirm
21 that the project may capture the benefits of replacing an aging system.

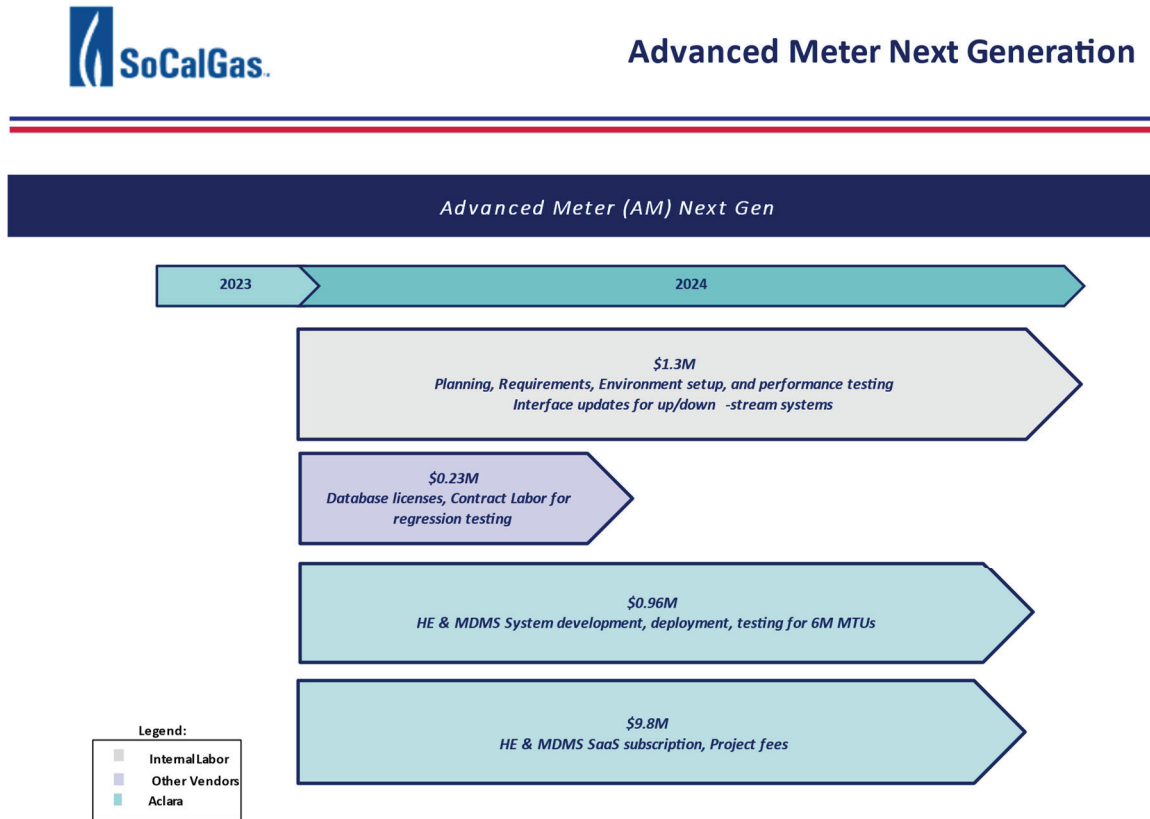
22 The trajectory of this project is further outlined in the following Gantt chart, which
23 depicts the critical milestones with forecasted spending by year and a high-level schedule of the
24 work to be completed for the. Advanced Meter Next Generation project.

³⁶ See Discussion of six phases of SAP Transformation, above, at BG-WE-9 - BG-WE-10; Ex. SCG-21-R (Gordon, Ballard, and Exon); see also Appendix B, SoCalGas Responses to TURN-SEU-064, Question 1a, 1b and 1c and 2.

³⁷ While benefits, such as cost savings and other avoided costs are anticipated for this project, those benefits will not be realized until the project has been placed into service.

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**Figure 3-WE
Advance Meter Next Generation**



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TURN offers no alternative to this project if a solution for the nearing end of life and out of support system is rejected, as it requests. And, its lack of an alternative will default SoCalGas into using an obsolete system with limited functionality and services to SoCalGas customers. If TURN’s recommendation were adopted, SoCalGas will not have operational Advanced Meter systems that are critical for utilities, especially during emergency situations and to aid in ensuring the safety of customers. Our customers will not be billed on-time and have inaccurate bills as the metering reading for the billing cycle will be delayed. This will result in higher costs to support our operation due to loss of data and will harm customers.

TURN’s statements regarding SoCalGas’s attrition request are also incorrect and demonstrate the lack of understanding of post-test year (PTY) ratemaking. SoCalGas is not seeking the attrition year increases for this project, as TURN suggests. Rather, as described in the Post-Test Year Ratemaking testimony of Khai Nguyen (Exhibit SCG-40-2R; Exhibit SCG-40-S/SDG&E-45-S; Exhibit SCG-240), SoCalGas is seeking a “PTY ratemaking mechanism to

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1 adjust its authorized revenue requirement in the post-test years by applying separate attrition
2 adjustments for operating and maintenance (O&M) expenses (including a separate attrition
3 adjustment for medical expenses), capital-related costs and exogenous cost changes.”³⁸ Mr.
4 Nguyen further states “the PTY ratemaking mechanism is designed to provide the level of
5 funding necessary to support important safety, reliability, and technology projects, while
6 promoting productivity and efficiencies during the next GRC cycle.”³⁹ As Mr. Nguyen’s
7 testimony explains the PTY revenue requirement is requested for SoCalGas, not individual
8 projects like the AclaraONE project.

9 For the reasons stated above, SoCalGas requests the Commission reject TURN’s position
10 and adopt SoCalGas’s forecast as reasonable.

11 **D. PACER WFM Replacement Project/VistaOne (WP# 00754AK).**

12 **1. TURN**

13 TURN challenges the SoCalGas PACER WFM Replacement project and asks that the
14 Commission reject the proposed project. TURN asserts that “There is no business case, no cost-
15 benefit analysis, and no quantification of potential benefits.”⁴⁰ TURN states “SoCalGas requests
16 over \$60 million for its PACER WFM Replacement Project between 2022 and 2027 (\$7.024 in
17 2022, \$11.907 million in 2023, \$13.773 million in 2024, and attrition years).”⁴¹

18 SoCalGas disagrees with TURN’s assertions, which fail to consider the information that
19 SoCalGas has provided to support the need and justification for this project, including the
20 necessity for this system upgrade and the impact to SoCalGas business operations and customer
21 service should the project not be approved. TURN’s recommendation also fails to account for
22 the significant technology risks presented if the critical upgrade to the PACER WFM system is
23 not performed. The 30-year-old PACER application was developed on the legacy mainframe
24 and its existing architecture is complex, inflexible, and costly to modify and support. At the time
25 when SoCalGas was developing its forecast for the WFM PACER Replacement in this GRC, the
26 project was in the early stages of development and design. Based on rough cost estimates the

³⁸ Ex. SCG-40-2R (Second Revised Prepared Direct Testimony of Khai Nguyen (Post-Test Year Ratemaking)) at KN-1.

³⁹ *Id.*, at NG-2.

⁴⁰ Ex. TURN-09 (Cheng) at 8.

⁴¹ *Id.*

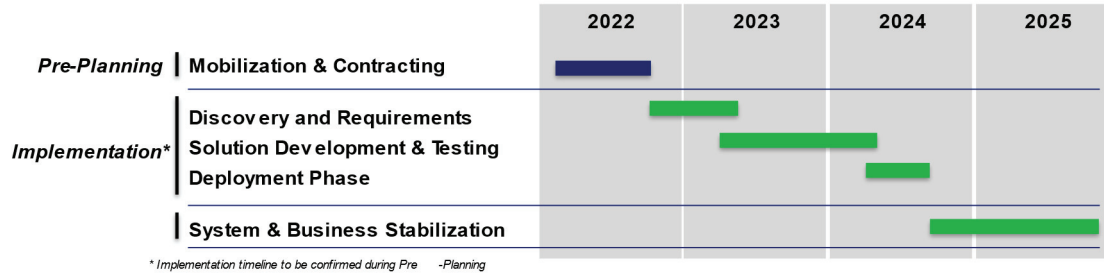
1 project was approved to move forward to the next phase of the business case. The forecast is
2 now more refined and SoCalGas has determined that there is an unquantified net benefit to
3 customers. The Customer Services – Field and Advanced Meter Operations direct and rebuttal
4 testimony (Exhibit SCG-14; Exhibit SCG-214) provides the business justification for this
5 project.

6 TURN claims that SoCalGas’s support is lacking and that it has failed to quantify
7 potential benefits in testimony to show the PACER WFM project is just and reasonable.
8 SoCalGas disagrees with TURN’s assessment. In addition to the details provided in direct
9 testimony (Exhibit SCG-21-R) and capital workpapers (Exhibit SCG-21-CWP-R), SoCalGas has
10 provided TURN with additional quantitative details about the project, as they have progressed
11 over the design and development process described above.⁴² The details provided show the
12 PACER WFM project has progressed through the business case and pre-planning stage as
13 SoCalGas progresses to the implementation phase of the project. This project allows SoCalGas
14 to avoid the business risks and system shortfalls described above that the current aging system
15 faces as it reaches its EOL and EOS stages, and should avoid further costs that would be
16 associated with paying for legacy system upgrades to keep an out of support system functioning
17 until another solution is approved, and provide a system that is more responsive to business
18 needs and efficiencies by moving the systems to the Cloud. WFM PACER Replacement project
19 will simplify the day-to-day work and enable our team to concentrate efforts and expertise on
20 what we do best by providing safe and reliable service to our customers. WFM PACER
21 Replacement project is laying the groundwork that will enable us to continually improve and
22 proactively create effortless experiences that benefit our customers.

23 The trajectory of this project is further outlined in the following Gantt chart, which
24 depicts the critical milestones with forecasted spending by year and a high-level schedule of the
25 work to be completed for the PACER WFM Replacement.

⁴² See Discussion of six phases of SAP Transformation, above, at BG-WE-9 - BG-WE-10; Ex. SCG-21-R (Gordon, Ballard, and Exon); see also Appendix B, SoCalGas Responses to TURN-SEU-064, Question 1a, 1b and 1c. While benefits, such as cost savings and other avoided costs, are anticipated for this project, those benefits will not be realized until the project has been placed into service.

Estimated Schedule and Total Costs



Cost Type	Capital (\$MM)	O&M (\$MM)	Total (\$MM)	
WFM – Loaded Costs (w/ AFUDC)	\$48	\$12	\$60	
Total Costs (Capital & O&M)	Total	2022	2023	2024
Labor (internal & vendor)	\$34	\$4	\$16	\$14
Hardware & Software	\$2.5	\$0.4	\$1.1	\$1
Other Costs	\$2	\$0.3	\$1.2	\$0.5
Loaders	\$13	\$1	\$5.7	\$6.3
AFUDC	\$3.5	\$0.3	\$1.7	\$1.5
Contingency (10%)	\$5.3	\$0.3	\$3	\$2
Total	\$60	\$6	\$29	\$25



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TURN offers no alternative to this project if a solution for the nearing end of life and out of support system is rejected, as it requests. And its lack of an alternative will default SoCalGas into using an obsolete system with limited functionality and services to SoCalGas customers. If TURN’s recommendation were adopted, SoCalGas will not have an operational Workforce Management system that is critical for utilities, especially during emergency situations and to aid in ensuring the safety of customers and timely restoration of our services during outages and to manage workforce effectively and efficiently. Workforce Management (WFM) is the heartbeat of Customer Services Field (CSF) operations driving what field work can be done, by whom and when. Looking forward, existing PACER WFM cannot support the changing business needs, regulatory requirements, or the ability to execute the Customer Services Filed (CSF) business processes the way operations is demanding. If this project is not approved, it will result in higher costs to operation and support, risk of operational disruptions, and loss of productivity, and it will harm customers. For the reasons stated above, SoCalGas requests the Commission reject TURN’s position and adopt SoCalGas’s forecast as reasonable. TURN’s statements regarding SoCalGas’s attrition request are also incorrect and demonstrate the lack of understanding of post-

1 test year (PTY) ratemaking. SoCalGas is not seeking the attrition year increases for this project,
2 as TURN suggests. Rather, as described in the Post-Test Year Ratemaking testimony of Khai
3 Nguyen (Exhibit SCG-40-2R; Exhibit SCG-40-S/SDG&E-45-S; Exhibit SCG-240), SoCalGas is
4 seeking a “PTY ratemaking mechanism to adjust its authorized revenue requirement in the post-
5 test years by applying separate attrition adjustments for operating and maintenance (O&M)
6 expenses (including a separate attrition adjustment for medical expenses), capital-related costs
7 and exogenous cost changes.”⁴³ Mr. Nguyen further states “the PTY ratemaking mechanism is
8 designed to provide the level of funding necessary to support important safety, reliability, and
9 technology projects, while promoting productivity and efficiencies during the next GRC
10 cycle.”⁴⁴ As Mr. Nguyen’s testimony explains the PTY revenue requirement is requested for
11 SoCalGas, not individual projects like PACR.

12 **V. CONCLUSION**

13 The Commission should adopt SoCalGas’s proposed O&M TY2024 forecast of \$57.234
14 million as no parties contest the SoCalGas IT O&M forecast. The Commission should also
15 adopt SoCalGas’s Capital forecast of \$253.159 million in 2022, \$229.046 million in 2023, and
16 \$174.827 million in 2024. SoCalGas has addressed the proposed recommendations presented by
17 parties and demonstrated that their proposals are not warranted. The Commission should also
18 recognize that any disallowance recommended by the parties for SoCalGas to invest in
19 operations and technology may lead to increased risks, cybersecurity threats, and inefficiencies
20 in our systems, and also have a direct impact in the delivery of reliable, safe, efficient, and secure
21 services to our customers. Cal Advocates and TURN proposed disallowances, with no
22 corresponding alternative proposal, do not address the need for these projects, and do not
23 consider the risks and downstream impacts that delaying or foregoing these IT investments will
24 pose in terms of safety, reliability, and customer service.

25 This concludes my prepared rebuttal testimony.

⁴³ Ex. SCG-40-2R (Nguyen) at KN-1.

⁴⁴ *Id.*, at NG-2.

**APPENDIX A
GLOSSARY OF TERMS**

ACRONYM	DEFINITION
A.	Application
AM	Advanced Meter
Commission	California Public Utilities Commission
CPD	Construction Planning & Design
CSF	Customer Services Field
D.	Decision
ECC	SAP ECC is the ERP Central component of the existing SAP Business Suite
EOL	End of Life
EOS	End of Support
Ex.	Exhibit
GRC	General Rate Case
IT	Information Technology
MTU	Meter Transmission Unit
PACER	Portable Automated Centralized Electronic Retrieval System
PAO	Public Advocates Office
RAMP	Risk Assessment Mitigation Phase
RFP	Request for Proposal
SAP	Systems, Applications, and Products
SDG&E	San Diego Gas & Electric Company
SoCalGas	Southern California Gas Company
TURN	The Utility Reform Network
TY	Test Year
WFM	Workforce Management

APPENDIX B
DATA REQUEST RESPONSE

Data Request Number: PAO-SCG-026-LMW

Proceeding Name: A2205015_016 - SoCalGas and SDGE 2024 GRC

Publish To: Public Advocates Office

Date Received: 8/22/2022

Date Responded: 9/6/2022

1. Regarding the capital projects identified in the attached table please provide the following information:

Capital Project and Category (in \$000's)	2022	2023	2024
00756AV Financial Risk Mgmt. – Category A	1,575	6,752	5,177
00768I Sap S/\$ HANA – Category A	0	2,124	4,677
00756L SAP Transformation – Category A	5,168	42,882	22,562
00754AK RAMP PACER Work – Category B	7,023	11,908	13,773
00721AA-AF RAMP Port Mgmt. – Category G	1,934	4,746	7,071
00756AB RAMP RDMS Phase V – Category G	0	6,268	6,474
00756I RAMP Gas Materials QA – Category G	2,644	2,496	2,600
00756U RAMP GIS Portal – Category G	2,584	3,447	2,147
00756X HR Corp Data – Category I	3,234	4,588	3,588
00721AS RAMP Cloud Foundation – Category J	5,562	5,562	5,562
00734B RAMP Local Area Upgrade – Category J	6,680	6,054	6,137
00756Q Service Now 6206 – Category J	0	6,206	2,035
00756T Foundations Analytics – Category J	4,574	3,524	2,794
00721AP RAMP Identity Cloud – Category J	2,026	4,062	3,288
00721E RAMP Digital Workspace – Category J	19,738	0	0
00756Y Microsoft Agreement – Category J	28,000	0	0
00786B Digital Process Automation – Category J	7,617	4,047	4,047
00756O RAMP Enviro Health – Category K	6,826	6,173	7,177
00756K/86G Pay ES2P/Value – Category L	13,801	5,694	1,588

a. Project cost support (inclusive of calculations and support for those calculations) clearly identifying how the amounts for each year (2022, 2023, and 2024) were determined.

SoCalGas Response 1a:

SoCalGas objects to this request pursuant to Rule 10.1 of the Commission’s Rules of Practice and Procedure on the grounds that it is vague and ambiguous as to the phrase “Project cost support.” Notwithstanding the objection noted above, for purposes of this data response, SoCalGas interprets project cost support to mean costs broken down between labor and non-labor. Subject to and without waiving this objection, SoCalGas responds by answering Question 1a as follows:

SoCalGas developed its project cost estimates based on subject matter experts and proprietary vendor input.

Responses to Question 1a can be found in the individual attachment for each project in the table below, identified by the Project Work Paper. Please note minor corrections to Work Paper numbers identified below.

Data Request Number: PAO-SCG-026-LMW

Proceeding Name: A2205015_016 - SoCalGas and SDGE 2024 GRC

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Project Name	Work Paper	Project Status	If in Execution, what phase is it in?	File Name
Financial Risk Mgmt	00756AV	Execution	Requirements/Design	PAO-SCG-026-LMW_SCG-21_00756AV Financial Risk Mgmt
Sap S/4 HANA - Category A	00786I (not 00768I)	Concept		00786I (not 00768I) - SAP S4 HANA - BUSINESS OPTIMIZATION
SAP Transformation	00756L	Execution	Requirements/Design	PAO-SCG-026-LMW_SCG-21_00756L SAP Transformation
RAMP PACER Work	00754AK	Business Case		PAO-SCG-026-LMW_SCG-21_00754AK PACER WFM Replacement
AF RAMP Port Mgmt.	00721AA	Execution	Requirements/Design	PAO-SCG-026-LMW_SCG-21_00721AA Project & Portfolio
AF RAMP Port Mgmt.	00721AE	Concept		PAO-SCG-026-LMW_SCG-21_00721AE Project & Portfolio
AF RAMP Port Mgmt.	00721AF	Concept		PAO-SCG-026-LMW_SCG-21_00721AF Project & Portfolio
RAMP RDMS Phase V	00756AB	Concept		PAO-SCG-026-LMW_SCG-21_00756AB RAMP RDMS Phase V
RAMP Gas Materials QA	00756I	Execution	Agile	PAO-SCG-026-LMW_SCG-21_00756I RAMP Gas Materials QA
RAMP GIS Portal	00721U(NOT 00756U)	Execution	Agile	PAO-SCG-026-LMW_SCG-21_00721U (NOT 00756U) RAMP GIS Portal
HR Corp Data	00756X	Execution	Build/Testing	PAO-SCG-026-LMW_SCG-21_00756X HR Corp Data
RAMP Cloud Foundation	00721AS	Execution	Agile	PAO-SCG-026-LMW_SCG-21_00721AS RAMP Cloud Foundation
RAMP Local Area Upgrade	00743B (NOT 00734B)	Execution	Agile	PAO-SCG-026-LMW_SCG-21_00743B (NOT 00734B) Local Area
Service Now 6206	00756Q	Concept	Requirements/Design	PAO-SCG-026-LMW_SCG-21_00756Q Service Now 6206
Foundations Analytics	00756T	Execution	Agile	PAO-SCG-026-LMW_SCG-21_00756T Foundations Analytics
RAMP Identity Cloud	00721AP	Business Case		PAO-SCG-026-LMW_SCG-21_00721AP Identity and Access
RAMP Digital Workspace	00721E	Execution	Agile	PAO-SCG-026-LMW_SCG-21_00721E RAMP Digital Workspace
Microsoft Agreement	00756Y	Concept		PAO-SCG-026-LMW_SCG-21_00756Y Microsoft Agreement
Digital Process Automation	00786B	Execution	Implementation	PAO-SCG-026-LMW_SCG-21_00786B Digital Process Automation
RAMP Enviro Health	00756O	Execution	Build/Testing	PAO-SCG-026-LMW_SCG-21_00756O RAMP Enviro Health
Pay ES2PNalue	00756K	Execution	Implementation	PAO-SCG-026-LMW_SCG-21_00756K Pay ES2PNalue
Enterprise Source to Pay (ES2P) Value	00786G	Concept		PAO-SCG-026-LMW_SCG-21_00786G Enterprise Source to Pay (ES2P)

b. Is the project approved by management indicating regardless of the outcome of this instant GRC that the project will be started and completed. Or is the project subject to management discretion and funding, indicating projects may or may not actually be started and completed within this current GRC cycle.

SoCalGas Response 1b:

SoCalGas objects to this request pursuant to Rule 10.1 of the Commission’s Rules of Practice and Procedure on the grounds that it is vague and ambiguous. Subject to and without waiving this objection, SoCalGas responds by answering Question 1b as follows:

As described in SoCalGas Testimony (Chapter 2, section VIII, subsection B) of Tia L. Ballard and William J. Exon (Ex. SCG-21), project approval may occur in various phases of the process to identify, develop, and proceed to execution of a project. Similarly, an identified project may not commence execution or achieve completion or may be deferred for various reasons after a Business Case has been approved. Those reasons include, but are not limited to, other competing business priorities, system vulnerabilities, scope changes, internal and vendor resources availability, and management discretion.

c. Does the project provide any cost savings? If no, then why not? If yes, the amount of savings, support for the calculation of those savings, and where in the current GRC those savings are recognized.

SoCalGas Response 1c:

Data Request Number: PAO-SCG-026-LMW

Proceeding Name: A2205015_016 - SoCalGas and SDGE 2024 GRC

Publish To: Public Advocates Office

Date Received: 8/22/2022

Date Responded: 9/6/2022

SoCalGas objects to this request pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure on the grounds that it is vague and ambiguous as to the definition of "cost savings" and calls for speculation. Subject to and without waiving these objections, SoCalGas responds by answering Question 1c as follows:

IT projects are developed to support the Company's operations and capture a variety of benefits for business operations and customers. See SoCalGas testimony (Chapter 1, section I, subsection A; Chapter 2, section I, subsections A and C) of Tia L. Ballard and William J. Exon (Ex. SCG-21). By their nature, technology solutions are woven into everyday activities. To the extent savings may be present, any potential cost savings related to a particular project may be tangible and/or intangible and can range from avoided costs to enablement of business efficiencies. For example, users may be forced to leverage less efficient workarounds when technologic services are not available. By providing more reliable technology services, IT enables SoCalGas business units to improve their operations rather than being less productive when the systems are not available and ready for their usage.

d. A project timeline showing start date, completion milestones, and completion date.

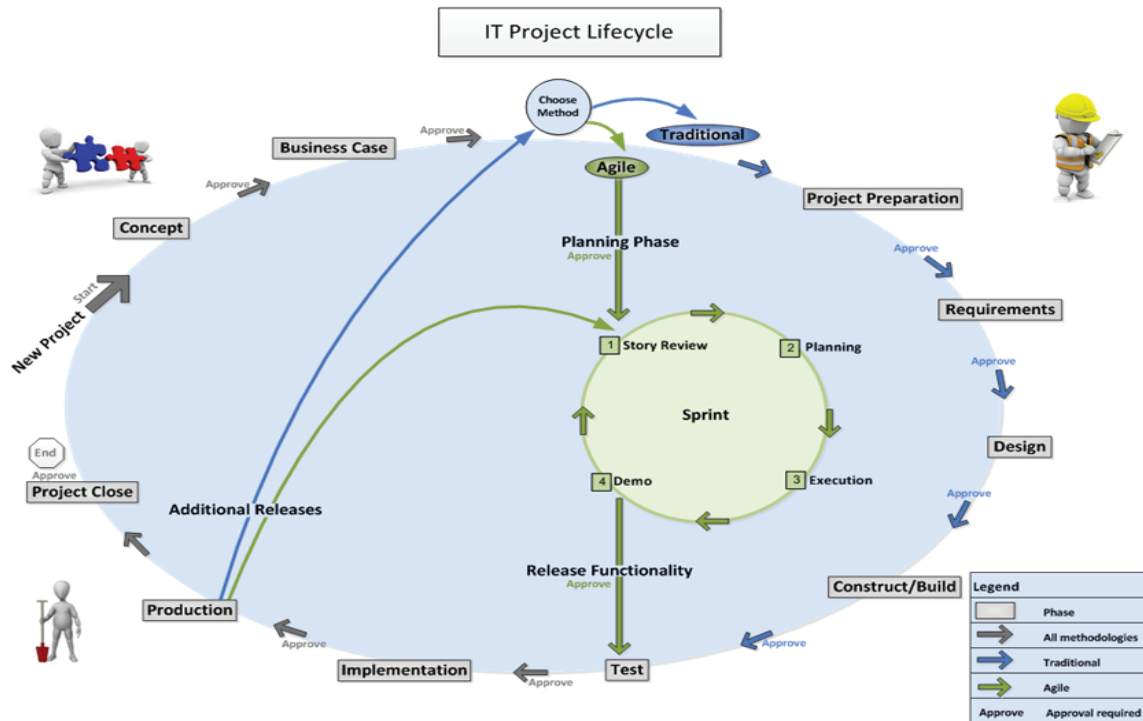
SoCalGas Response 1d:

The estimated timeline provided for each identified project in response to Question 1d reflects the start date, completion milestones, and completion date where applicable. Please see the Attachment accompanying response to Question 1a for the related project. SoCalGas developed its project timeline based on subject matter experts and proprietary vendor input.

e. At what stage is the project in its project life cycle? In providing an answer, please describe SCG's project life cycle process, phases, and a description of what each phase means.

SoCalGas Response 1e:

Please see the "Project Status" field in the table provided in response to Question 1a above. SoCalGas further provides the following a visual of the IT Project Lifecycle:



Below are descriptions of the activities that occur in various phases within the IT Project Lifecycle. This agile project timeline is represented in short cycles, as described in the SoCalGas testimony (Chapter 1, section I, subsection B) of Ben Gordon, Tia L. Ballard and William J. Exon (Ex. SCG-21).

Concept:

Investigate technology and new business opportunities to recommend whether or not to develop and implement technology products. Provide early high-level analysis of potential solutions, costs, and benefits.

Business Case:

Defines the scope of work and estimated total cost of project. The primary purpose of this phase is to provide a detailed analysis to present the business value of a project along with its budget, schedule, and ongoing support requirements.

Execution

Project Preparation Phase:

Data Request Number: PAO-SCG-026-LMW

Proceeding Name: A2205015_016 - SoCalGas and SDGE 2024 GRC

Publish To: Public Advocates Office

Date Received: 8/22/2022

Date Responded: 9/6/2022

Complete the preparations necessary to plan and mobilize resources needed for the completion of the project as approved in the Business Case.

Requirements Phase:

Develop detailed requirements to define and document client's needs. Obtain agreement from IT, the requestor(s), and the stakeholders. Define the risks and dependencies and, if necessary, update the estimated effort.

Design Phase:

Develop product design and operating specification in preparation for the Construct/Build Phase. Consider sourcing options. Initiate security design. Evaluate the overall design effort for ability to trace requirements and any missing requirements needed to deliver the Business Case.

Construct/Build Phase:

Complete the steps necessary to establish a product which meets client requirement specifications and system design specifications. Complete the deliverables necessary to prepare for testing the product and for training personnel to use and support it.

Test Phase:

Test and verify end-to-end functionality of the product. Verify all requirements are implemented and at an acceptable level of quality. Perform test cases to assure that each component of the product executes without errors.

Implementation:

Implement new and enhanced application systems and infrastructure hardware/software into production support environment. Provide storm period support as partnership between project team and production support organizations.

Production Phase:

Provides the baseline service level required to sustain normal operations of the production environment for application and infrastructure hardware and software.

Project Closeout:

Formally close out the project financials (work orders, invoices, etc.), review the project to determine best practices and lessons learned.

Agile software development:

Agile software development refers to a group of software development methodologies based on iterative development, where requirements and solutions evolve through collaboration between self-organizing cross-functional teams.

Data Request Number: PAO-SCG-026-LMW

Proceeding Name: A2205015_016 - SoCalGas and SDGE 2024 GRC

Publish To: Public Advocates Office

Date Received: 8/22/2022

Date Responded: 9/6/2022

f. Were any alternatives considered? If no, then why not? If yes, then provide a description of the alternative considered, the cost, and why SCG chose not to adopt the alternative.

SoCalGas Response 1f:

Pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, SoCalGas objects to this request on the grounds that the request seeks information not relevant to the subject matter involved in the pending proceeding and therefore, the burden, expense and intrusiveness of this request outweighs the likelihood that the information sought will lead to the discovery of admissible evidence. SoCalGas also objects on the grounds that it is vague and ambiguous. In particular, this request seeks information concerning costs associated with "alternatives considered." Subject to and without waiving this objection, SoCalGas responds as follows answering Question 1(f):

Please see the Attachment accompanying response to Question 1a for the related project for the response to Question 1f.

g. Were any of the project costs subject to competitive bidding? If no, then why not? If yes, then please provide the metrics used and results of the bidding process.

SoCalGas Response 1g:

Pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, SoCalGas objects to this request on the grounds that the request seeks information not relevant to the subject matter involved in the pending proceeding and therefore, the burden, expense and intrusiveness of this request outweighs the likelihood that the information sought will lead to the discovery of admissible evidence. In particular, this request seeks information concerning "project costs subject to competitive bidding," "metrics used" and "results of the bidding process." Subject to and without waiving this objection, SoCalGas responds as follows answering Question 1(g):

Please see the Attachment accompanying response to Question 1a for the related project for the response to Question 1g.

h. In reference to project 00756L SAP Transformation, is SCG aware of any projects this size subject to memorandum account treatment. If yes, what were the reasons for recording the costs to a memorandum account as opposed to inclusion in a GRC?

Data Request Number: PAO-SCG-026-LMW

Proceeding Name: A2205015_016 - SoCalGas and SDGE 2024 GRC

Publish To: Public Advocates Office

Date Received: 8/22/2022

Date Responded: 9/6/2022

SoCalGas Response 1h:

No, SoCalGas does not have any IT projects the size of the 00756L SAP Transformation project that are subject to memorandum account treatment.

i. In reference to RAMP projects, are all the RAMP projects absolutely started and completed as forecasted in a GRC? Or are RAMP projects subject to management discretion and funding indicating projects may or may not actually be started and completed within a GRC cycle?

Capital Project and Category (in \$000's)	2022	2023	2024
00756AV Financial Risk Mgmt. – Category A	1,575	6,752	5,177
00768I Sap S/\$ HANA – Category A	0	2,124	4,677
00756L SAP Transformation – Category A	5,168	42,882	22,562
00754AK RAMP PACER Work – Category B	7,023	11,908	13,773
00721AA-AF RAMP Port Mgmt. – Category G	1,934	4,746	7,071
00756AB RAMP RDMS Phase V – Category G	0	6,268	6,474
00756I RAMP Gas Materials QA – Category G	2,644	2,496	2,600
00756U RAMP GIS Portal – Category G	2,584	3,447	2,147
00756X HR Corp Data – Category I	3,234	4,588	3,588
00721AS RAMP Cloud Foundation – Category J	5,562	5,562	5,562
00734B RAMP Local Area Upgrade – Category J	6,680	6,054	6,137
00756Q Service Now 6206 – Category J	0	6,206	2,035
00756T Foundations Analytics – Category J	4,574	3,524	2,794
00721AP RAMP Identity Cloud – Category J	2,026	4,062	3,288
00721E RAMP Digital Workspace – Category J	19,738	0	0
00756Y Microsoft Agreement – Category J	28,000	0	0
00786B Digital Process Automation – Category J	7,617	4,047	4,047
00756O RAMP Enviro Health – Category K	6,826	6,173	7,177
00756K/86G Pay ES2P/Value – Category L	13,801	5,694	1,588

SoCalGas Response 1i:

SoCalGas objects to this request on the grounds that it calls for speculation. Subject to and without waiving the foregoing objections, SoCalGas responds as follows:

Please see objections and response to Question 1b.

Data Request Number: PAO-SCG-026-LMW

Proceeding Name: A2205015_016 - SoCalGas and SDGE 2024 GRC

Publish To: Public Advocates Office

Date Received: 8/22/2022

Date Responded: 9/6/2022

3. In relation to Q.2 above, for those projects management chose not to fund, please provide a reason why management did not approve the project for completion and whether those same projects are requested in this current GRC.

SoCalGas Response 3:

SoCalGas objects to this request under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence. SoCalGas further objects on the grounds that the burden, expense and intrusiveness of this request clearly outweigh the likelihood that the information sought will lead to the discovery of admissible evidence. SoCalGas also objects to the request in that it seeks information that may be outside the scope of this proceeding.

Subject to and without waiving the foregoing objection, SoCalGas responds as follows:

Not applicable. SoCalGas has not requested in its Test Year (TY) 2024 GRC Application any of the projects requested in the TY 2019 GRC.

00754AK PACER WFM Replacement Project

1a. Project cost support (inclusive of calculations and support for those calculations) clearly identifying how the amounts for each year (2022, 2023, and 2024) were determined.

Response 1a 2022:

Year 2022 - 00754AK PACER WFM Replacement Project	
	<i>(In 2021 \$000s)</i>
<u>NON-LABOR COSTS</u>	
Hardware	\$ 19
Software	\$ 1,950
Prepaid Maintenance	\$ -
Vendor Services	\$ 3,436
	\$ 5,405
<u>LABOR COSTS</u>	
13.5 FTEs	\$ 1,375
V&S Factor (17.65%)	\$ 243
	\$ 1,618
TOTAL COSTS	\$ 7,023

Response 1a 2023:

Year 2023 - 00754AK PACER WFM Replacement Project	
	<i>(In 2021 \$000s)</i>
<u>NON-LABOR COSTS</u>	
Hardware	\$ 38
Software	\$ 50
Prepaid Maintenance	\$ -
Vendor Services	\$ 6,468
	\$ 6,556
<u>LABOR COSTS</u>	
44.6 FTEs	\$ 4,549
V&S Factor (17.65%)	\$ 803
	\$ 5,352
TOTAL COSTS	\$ 11,908

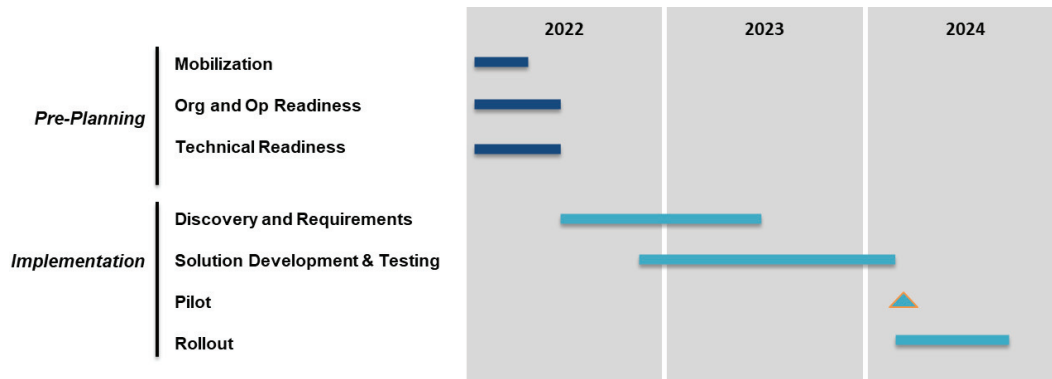
Response 1a 2024:

Year 2024 - 00754AK PACER WFM Replacement Project	
	<i>(In 2021 \$000s)</i>
<u>NON-LABOR COSTS</u>	
Hardware	\$ 35
Software	\$ -
Prepaid Maintenance	\$ -

Vendor Services	\$	10,307
	\$	10,342
<u>LABOR COSTS</u>		
28.6 FTEs	\$	2,916
V&S Factor (17.65%)	\$	515
	\$	3,431
TOTAL COSTS	\$	13,773

d. A project timeline showing start date, completion milestones, and completion date.

Response 1d:



f. Were any alternatives considered? If no, then why not? If yes, then provide a description of the alternative considered, the cost, and why we chose not to adopt the alternative.

Response 1f:

The PACER system upgrade has multiple phases relating to the PACER mobile solution and the PACER mainframe application. The project team assessed options for PACER mainframe solution replacement. The options were upgrading or replacing the PACER mainframe and/or expanding the PACER mobile platform to deliver the capabilities needed by the business for the back-office functions, including, planning, scheduling, and dispatch. The PACER mobile solution was implemented beginning in 2019. The PACER mainframe replacement is the next phase. The PACER mainframe replacement will integrate with the expanded PACER mobile platform capabilities, which was determined to be the most feasible and cost-effective solution.

g. Were any of the project costs subject to competitive bidding? If no, then why not? If yes, then please provide the metrics used and results of the bidding process.

Response 1g:

The initial PACER Program was holistically evaluated via a competitive bidding process in 2017. The replacement of the PACER mainframe application is an expansion of that

program. The key metrics used in vendor selection include requirement coverage, usability, security, general architecture, pricing, ease of integration, and vendor health. No new RFP will be required.

00756L SAP Transformation

1a. Project cost support (inclusive of calculations and support for those calculations) clearly identifying how the amounts for each year (2022, 2023, and 2024) were determined.

Response 1a 2022:

Year 2022 - 00756L SAP Transformation	
	<i>(In 2021 \$000s)</i>
<u>NON-LABOR COSTS</u>	
Hardware	\$ 1,124
Software	\$ -
Prepaid Maintenance	\$ -
Vendor Services	\$ 3,003
	\$ 4,127
<u>LABOR COSTS</u>	
8.7 FTEs	\$ 885
V&S Factor (17.65%)	\$ 156
	\$ 1,041
TOTAL COSTS	\$ 5,168

Response 1a 2023:

Year 2023 - 00756L SAP Transformation	
	<i>(In 2021 \$000s)</i>
<u>NON-LABOR COSTS</u>	
Hardware	\$ 320
Software	\$ 18,000
Prepaid Maintenance	\$ -
Vendor Services	\$ 22,000
	\$ 40,320
<u>LABOR COSTS</u>	
21.4 FTEs	\$ 2,178
V&S Factor (17.65%)	\$ 384
	\$ 2,562
TOTAL COSTS	\$ 42,882

Response 1a 2024:

Year 2024 - 00756L SAP Transformation	
	<i>(In 2021 \$000s)</i>
<u>NON-LABOR COSTS</u>	
Hardware	\$ -
Software	\$ -

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Prepaid Maintenance	\$	-
Vendor Services	\$	20,000
	\$	20,000
<u>LABOR COSTS</u>		
21.4 FTEs	\$	2,178
V&S Factor (17.65%)	\$	384
	\$	2,562
TOTAL COSTS	\$	22,562

d. A project timeline showing start date, completion milestones, and completion date.

Response 1d:



f. Were any alternatives considered? If no, then why not? If yes, then provide a description of the alternative considered, the cost, and why we chose not to adopt the alternative.

Response 1f:

No. SoCalGas currently utilizes the SAP ERP platform for its business and this project enhances the existing long-standing platform.

g. Were any of the project costs subject to competitive bidding? If no, then why not? If yes, then please provide the metrics used and results of the bidding process.

Response 1g:

An RFP was conducted for a systems integrator to lead the design/blueprint phase of the project. The winning bidder was chosen based on RFP responses that scored highest for pricing, experience, systems integration capabilities, process mapping capabilities, rollout planning and strategy, and technical question responses.

Once the current blueprinting phase is complete, an additional RFP will be conducted for the system implementation phase.

APPENDIX C

Gartner: Securing End-of-Support Production Systems

Published 15 March 2023

By Analyst(s): Evgeny Mirolyubov, Neil MacDonald, Tony Harvey

Gartner, *Energy and Utilities Technology Optimization and Modernization Primer for 2023, 2023.*

Securing End-of-Support Production Systems

Published 15 March 2023 - ID G00782821 - 15 min read

By Analyst(s): Evgeny Mirolyubov, Neil MacDonald, Tony Harvey

Initiatives: [Infrastructure Security](#)

Security risks increase as production systems reach the end of their manufacturer support life cycle quicker than the business can replace or retire them. Security and risk management leaders must collaborate with the infrastructure team to minimize the attack surface of end-of-support systems.

Overview

Key Findings

- Security and risk management leaders are frequently unaware of the business-critical systems running on unsupported operating systems and applications, causing technical debt in the organization.
- Interdependencies between operating systems, applications and middleware components often make upgrading just one end-of-support (EoS) component unworkable, requiring an upgrade of the entire system.
- Migrating business-critical applications from an EoS system may be impractical, requiring business leaders to continue to operate EoS systems while migration plans and funding are finalized.
- EoS systems are significantly more susceptible to compromise, becoming the gateway for broader operational and business disruptions.

Recommendations

Security and risk management leaders responsible for infrastructure security should:

- Collaborate with the infrastructure and enterprise architecture teams to maintain an updated inventory of production systems and EoS dates. Integrate IT asset management (ITAM) and unified endpoint management (UEM) data sources to create a holistic asset view.

- Decide which EoS systems to retire and which must continue to operate by working with business counterparts to define a risk profile for each system. At the minimum, assess business criticality, the volume and frequency of use, and connectivity requirements.
- Reduce the attack surface of each EoS system remaining in production, including those scheduled for retirement, by applying compensating security controls.
- Prepare and practice incident response and recovery procedures to identify tooling and procedure changes required for EoS production systems.

Strategic Planning Assumption

By October 2026, 75% of organizations using Microsoft Windows Server 2012 R2 will have yet to complete migrations to a supported platform.

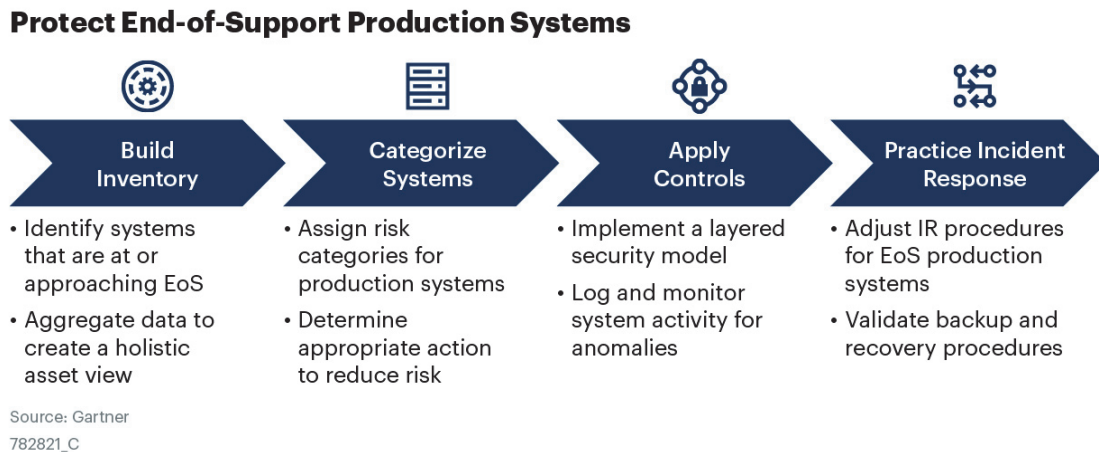
Introduction

All technology becomes obsolete and unsupported over time. While every security and risk management leader recognizes the truth in this statement, Gartner clients often mention that they are running end-of-support (EoS) production systems. ¹ Unsupported systems do not receive bug fixes, enhancements, and, most importantly, security patches – significantly increasing the risk of system compromise. ^{2,3}

While migration to a supported platform is recommended, it's usually difficult to justify the costs against the inherent risk. Upgrades are complex and sometimes not possible due to how applications were architected and the relationship between the app, operating system (OS) and middleware. Even if the application vendors support the updated OS, for business-critical systems this is a major operation that will require extensive testing. If the application vendor does not support the updated OS, then the application must be upgraded, which could require the database to be upgraded. What started as a simple OS upgrade has now become a complex multiyear program to upgrade the core ERP systems. Business applications seldom operate in isolation, and interdependencies between other applications and tools in enterprise environments will often make upgrading a very daunting task.

To protect EoS systems, security and risk management leaders must work with IT and business counterparts to maintain an updated asset inventory, categorize systems according to the level of risk, and apply compensating security controls (see Figure 1). Once implemented, each security layer needs to be continuously monitored and tested, and the security policies should be adjusted as new threats appear.

Figure 1. Protect End-of-Support Production Systems



Gartner.

Analysis

Inventory Production Systems

Security and risk management leaders need to inventory and assess their entire technology estate to identify components and systems that are either at or approaching EoS. This can be done using a variety of tools including: IT asset management (ITAM), software asset management (SAM), unified endpoint management (UEM), and threat and vulnerability management (TVM). Data should be aggregated into a configuration management database (CMDB) or enterprise architecture tool to create a holistic view that includes dependencies (see [ITSM Best Practices: A Guidance Framework for Implementing a Configuration Management Database](#)).

Examine the four layers for each production system:

- **Hardware** – Is the hardware still under warranty or being supported by the vendor or reputable third party, are spares available and are firmware updates still being delivered?
- **Operating system** – This is the most common attack vector, which makes availability of security patches and configuration baselines a critical requirement.
- **Middleware** – Databases, web services, and other middleware can become unsupported but still need patching and vendor or third-party support. SolarWinds and Log4j offer observability technology that exemplifies how unmanaged middleware can introduce significant risk.

- **Application** — Is the application still supported by the vendor, or is the source code still available to implement security fixes if it is a custom in-house application?

Most vendors publish EoS announcements with ample time to prepare for migration, and include recommendations on the migration path when available. Record the EoS date, system dependencies, and other relevant information for every system in the environment. Then, create reminders to ensure systems are upgraded, migrated or retired before EoS. Gartner also recommends that all EoS systems that remain in use are documented on a risk register to maximize transparency.

Categorize Systems According to the Level of Risk

Once the system inventory is built, organizations need to place each supported and unsupported system into one of the following risk categories:

- **High risk** — Systems that are internet-facing and/or contain trade secrets, intellectual property, personally identifiable or other regulatory data, are highly trusted by other systems, or are critical to running the business.
- **Medium risk** — Systems that contain public data and/or provide internal services to employees and systems that are trusted by other internal systems but not externally exposed.
- **Low risk** — Systems with limited users and functionality that provide noncritical services or are easily recoverable or replaceable.

As systems start to approach the end of their manufacturer support life cycle, determine the appropriate response action. Any EoS system that can be virtualized should be. While virtualization does not intrinsically make a system more secure, it provides several advantages. Virtualized systems remove dependencies on hardware, which may be out of support, and offer ways for system managers to take system snapshots that can be quickly restored in the event of a breach.

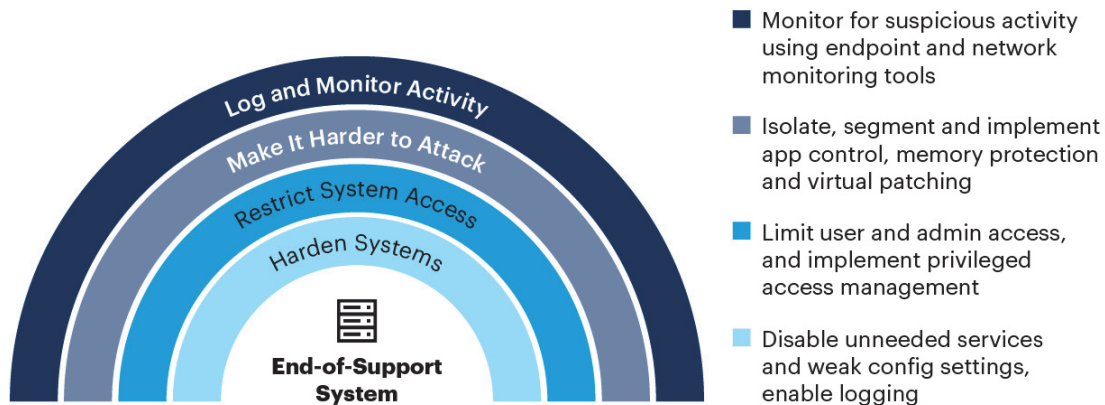
Organizations must also identify production systems that are not delivering useful work for the business, commonly referred to as “zombie servers/virtual machines (VMs).” Identifying and decommissioning these systems should be a priority, as removing them removes the associated security risk and can result in significant operational savings.

Apply Compensating Controls to Reduce Risk

Each system that cannot be retired or virtualized should have a layered security approach applied (see Figure 2), starting with the highest-risk systems. While it may seem that protecting low-risk systems is an unnecessary expense, any vulnerable system represents an extensive attack surface for threat actors wishing to gain an easy foothold into an organization to attack other systems, deploy ransomware, etc.

Figure 2. Adopt a Layered Security Approach

Adopt a Layered Security Approach



Source: Gartner
782821_C

Gartner.

Security and risk management leaders must consider the following factors when prioritizing compensating controls for each system:

- Ownership of the system (self versus third party)
- Each system's level of risk (high, medium, low)
- Remaining support time for systems approaching EoS
- The impact of selected compensating controls on the system
- Protection levels with compensating controls that are already applied to each system
- Compatibility of compensating controls with the EoS system

The life cycle and supportability of compensating security controls used for protection of legacy production systems is equally important. Organizations looking to continue using compensating controls already available to them should discuss the following points with prospective suppliers prior to making new purchases or commitments:

- Does the vendor have a roadmap for the solution selected as the compensating control? Or has the solution already reached end-of-life with no further enhancements planned for it by the vendor?
- Does the vendor continue to issue maintenance releases, logic updates and security patches to address discovered vulnerabilities; especially privilege escalation for agent-based controls?
- Does the vendor provide technical support in case of compatibility or deployment issues?
- Does the system require administrative rights or internet connectivity? Is a proxy or a gateway available for those that don't have the required connectivity?
- Does the solution rely on management consoles, database servers or any other vendor infrastructure that is itself planned for discontinuation?

The list above is not exhaustive and will change as new attack methods emerge. For the latest guidance, Gartner clients should schedule analyst inquiries to learn about the latest threats and how to combat them.

The compensating controls for EoS production systems fall into the areas described in the sub-sections below:

- Harden systems
- Restrict system access
- Make it harder to attack
- Log and monitor activity

Harden Systems

Misconfigurations are a frequent cause of system vulnerabilities. To reduce the attack surface, harden system configurations by disabling unnecessary services and removing default configurations. For example, if system services and unused software and drivers are uninstalled or disabled, then even if there is an exploit that targets those services, your systems are not vulnerable. Make your EoS systems more resilient to attacks and eliminate the root cause of many vulnerabilities by defining and implementing security hardening policies for all end-user endpoints and servers.

Use unified endpoint management (UEM) tools to deploy hardening scripts, Administrative Template XML-Based (ADMX) policies or prehardened OS images. Utilize off-the-shelf hardening standards, such as Microsoft Security Baselines,⁴ Center for Internet Security (CIS) Benchmarks,⁵ or DISA Security Technical Implementation Guidelines (STIGs) to uninstall and/or disable unneeded device drivers, services, software, and capabilities.⁶

Continue to patch any supported software that still remains on the EoS system. For example, if the OS is out of support, applications running on the OS may still be supported and should be patched.

Restrict System Access

Restrict system access to authenticated users, and to only those users and groups that require explicit access. Use a privileged access management (PAM) system or significantly reduce administrative access and permissions, including system-level support accounts and service accounts. Ensure that any administrator accounts and passwords are unique to each system to prevent credential reuse in the event of a breach. Restrict physical access to the systems as well. For more information on privileged access management see [Guidance for Privileged Access Management](#).

For administrative access, mandate the use of a “jump” server running an up-to-date supported OS to manage EoS systems to further increase security. Remove the ability of administrators to connect to management interfaces of EoS systems via any other route. This makes network communication patterns predictable and, thus, easy to monitor.

Make It Harder to Attack

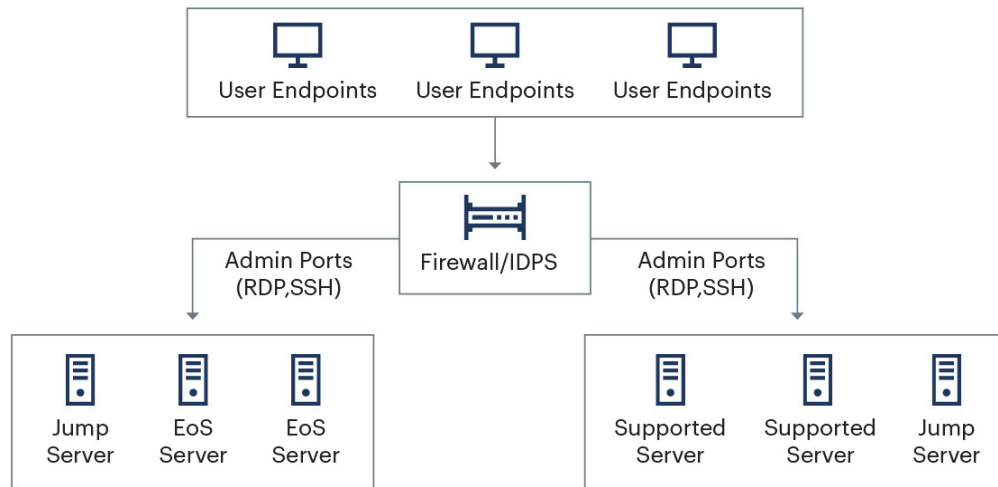
Use a cloud-native application protection platform (CNAPP) to provide consistent visibility and control of all production server workloads, both in the data center and the cloud, and protect against attacks. Assess and deploy CNAPP attack surface reduction functions, including the following:

- **System integrity assurance** – Ensures that the underlying hardware, firmware, hypervisor and VM have not been modified prior to boot up, and monitors critical system and configuration files while the system is running.
- **Application control/allow-listing** – Prevents threat actors from executing applications not on the allow list. Legacy production systems typically have a predictable set of trusted processes making these systems a good fit for allow-listing.
- **Exploit prevention/memory protection** – Prevents attacks attempting to exploit trusted applications running in the system’s memory space, and reduces risks of fileless and memory injection attacks and obfuscated malware.
- **Host-based intrusion protection system with vulnerability shielding** – Provides deep network traffic inspection to each VM and implements “virtual patching” capability to protect systems against attacks on known vulnerabilities.

To reduce lateral movement and network exposure, protect EoS systems using network segmentation. Segmentation is the creation of zones in a network that contains workloads or other assets that need to be isolated from the rest of the environment. Isolate EoS systems behind a firewall and restrict network access to these known vulnerable segments (see Figure 3). The basic principle for a segment containing EoS systems is to be in a default deny mode where all ports, protocols, IP addresses and MAC addresses are denied access unless specifically required for the system to operate.

Figure 3. Network Segmentation Example

Network Segmentation Example



Source: Gartner
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Gartner.

For high-security environments, apply network microsegmentation to segregate higher-risk systems from other systems in the same network segment. By using microsegmentation, if an attacker breaches the enterprise network, you can reduce the level of impact by making it harder for the attacker to spread laterally.

Network firewalling and microsegmentation are also a core element of the server workload protection strategy and are often included as a part of microsegmentation solutions (see [Emerging Tech: Adoption Growth Insights for Microsegmentation](#) for more information).

To protect legacy end-user endpoints, select and deploy an appropriate endpoint protection technology. Such solutions provide a level of prevention and detection, help meet internal and external audits, and serve for an acceptable period of use until the EoS endpoints are upgraded. Ensure that the endpoint protection vendor continues to issue security patches, detection content updates, and bug fixes during the remaining lifetime of the legacy endpoints retained (see [Magic Quadrant for Endpoint Protection Platforms](#) for more information).

Log and Monitor Activity

Prioritize legacy environments when assessing your monitoring strategy. Even the most basic host-level monitoring can make a big difference when dealing with active threats in the environment.

Behavioral monitoring is an advanced capability of modern CNAPP (runtime workload protection functionality) and endpoint protection platform (EPP) tools (detection and response functionality) that identify deviations from normal behavior by continuously analyzing network communications, processes launched, files opened and other behavioral patterns that indicate early signs of malicious activity. Security and risk management leaders should require CNAPP and EPP vendors to provide transparency on the differences in behaviors monitored and threat intelligence available for unsupported systems in comparison to a modern OS agent. Then, be prepared to supplement vendor threat intelligence with custom detection rules if the product functionality permits that.

Consider alternative monitoring technologies, such as network detection and response (NDR), especially for legacy systems that don't allow an agent installation. Even if the infrastructure is not adequately segmented, visibility into network traffic patterns and host-level activities will provide security leaders with an early warning system for abnormal behaviors. By implementing the compensating controls mentioned in this note, organizations should expect fewer deviations from normal behavior and a relatively predictable environment, which means the detections are more likely to be true positives.

Prepare and Practice Incident Response Procedures

Expect to be breached and be ready to perform a root cause analysis to identify and address the source of the exploited vulnerability (technology, process or people) and what methods might be used to prevent a recurrence. Security and risk management leaders must assess and document the impact of dealing with unsupported systems on incident response procedures and tools. For example, alert data collected from EoS systems may be less detailed due to limitations in security tool capabilities, impacting detection engineering and alert escalation processes. Incident declaration thresholds may differ, given the heightened risks associated with legacy systems. Containment, analysis and response workflows are likely to require additional expertise about the systems under attack and the methods of implementing these procedures.

Resource-constrained security teams should evaluate a managed detection and response (MDR) service to complement internal monitoring efforts with 24/7 coverage and expertise (for additional guidance, see [Market Guide for Managed Detection and Response Services](#)). Additionally, procure incident response retainer services in advance to supplement your team with external expertise when you need it most.

See [How to Create an Incident Response Plan](#) for more information on incident response planning and operations.

As a part of the strategy to protect EoS systems, the ability to restore compromised systems to a known good state is also required. Continue to back up EoS systems using existing tools. However, backing up physical installations relies on agents installed in the host operating system, which may not be supported in modern backup applications. For example, support for backing up endpoints like Windows XP is rapidly disappearing. So be prepared to keep a small footprint of the existing backup system available if you plan to replace it with a more modern alternative. Using disk imaging software for backup purposes, especially in the case of proprietary OT devices, like medical scanners and other OT device types, presents a viable alternative. Organizations must also update their backup and recovery procedures to account for these limitations in available backup approaches for EoS systems.

In the event of a system breach that bypasses all the compensating controls above, be prepared to migrate to a newer, supported version of the system. Proactively testing and training for such a scenario will help minimize downtime and impact on the business.

For backup strategy planning, see [Detect, Protect, Recover: How Modern Backup Applications Can Protect You From Ransomware](#).

Evidence

¹ Many production systems are running on near-end-of-support OS, such as Windows Server 2012/R2, which will be end of support on 10 October 2023. Unless migration projects are nearly complete, these systems will continue to be used in production after the end-of-support date. Most vendors will sell extended support at a high cost for a limited time (in the case of Windows 2012/R2, that is October 2026).

[SQL Server 2012 and Windows Server 2012/2012 R2 End of Support](#), Microsoft.

[Windows Server 2012 R2](#), Microsoft Product Life Cycle.

² “In 2021, for example, over 17% of newly discovered vulnerabilities were over five years old.”

“ninety-seven percent of successful credential stuffing attacks involve legacy authentication.”

[How Secure Are Your Legacy Systems?](#), Morphisec Breach Prevention Blog.

³ “Use of unsupported (or end-of-life) software in service of Critical Infrastructure and National Critical Functions is dangerous and significantly elevates risk to national security, national economic security, and national public health and safety. This dangerous practice is especially egregious in technologies accessible from the Internet.”

[Bad Practices](#), CISA

⁴ [Using Security Baselines in Your Organization](#), Microsoft.

⁵ [CIS Benchmarks List](#), Center for Internet Security.

⁶ [Security Technical Implementation Guides \(STIGs\)](#), The DoD Cyber Exchange.

Document Revision History

[Securing End-of-Support Production Systems - 24 December 2019](#)

Recommended by the Authors

Some documents may not be available as part of your current Gartner subscription.

[A Guidance Framework for Developing and Implementing Vulnerability Management](#)

[Prepare for Windows Server 2012 End Of Support](#)

[Magic Quadrant for Endpoint Protection Platforms](#)

[Emerging Tech: Adoption Growth Insights for Microsegmentation](#)

[How to Successfully Deploy Application Control](#)

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Energy and Utilities Technology Optimization and Modernization Primer for 2023

Published 2 February 2023 - ID G00779050 - 8 min read

By Analyst(s): Simon Cushing

Initiatives: [Energy and Utilities Technology Optimization and Modernization](#)

Technology is critical to energy and utility sustainability and resilience in a world of disruption, accelerating energy transition and water stress. Use this initiative to guide vital investments in technology optimization and modernization to provide their essential business capabilities.

Scope

The energy transition and global energy crises mean energy and utilities companies need new capabilities. Our initiative provides guidance on key technology systems for navigating these disruptions.

Topics in this initiative include:

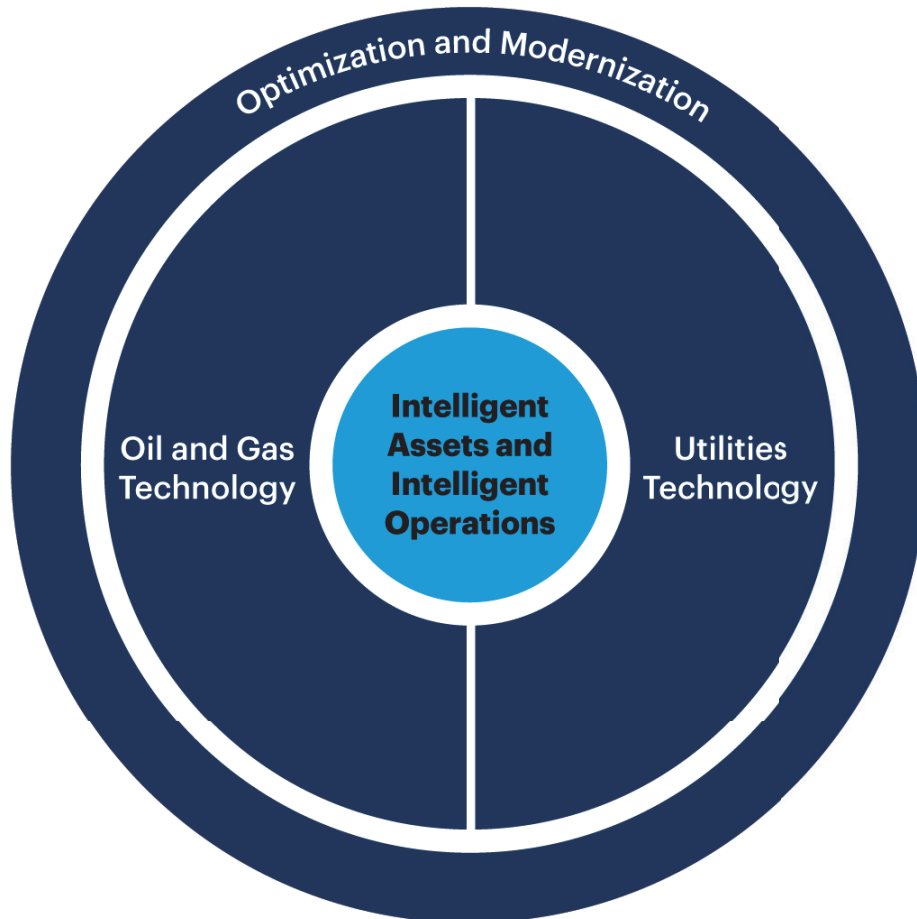
- **Oil and Gas Technology Optimization and Modernization:** Select, implement and exploit technologies that best support evolving oil and gas enterprise goals and enable business optimization.
- **Utilities Technology Optimization and Modernization:** Select, implement and exploit technologies that best support evolving utility enterprise redesign and operational goals and enable business optimization.

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Analysis

Figure 1. Energy and Utilities Technology Optimization and Modernization Overview

Energy and Utilities Technology Optimization and Modernization



Source: Gartner
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Gartner.

Across the world, energy systems and energy markets are under strain. As energy supply and trade reconfigure in response to Russia's invasion of Ukraine, energy prices – especially for natural gas – have risen dramatically. Electricity prices are spiking, and inflation and economic recession are hitting consumers, elevating the risk of a return to energy poverty for millions of people. Energy price caps, energy subsidy and windfall taxes are among the responses impacting energy markets as governments struggle to ensure affordable, secure energy for domestic consumers and industry. Water stress, and in particular the scarcity of accessible, affordable and acceptable clean water supplies, coupled with storms, flooding and rising sea levels, are threatening the balance in water security.

In the near term, outcomes and time frames are difficult to predict. However, it is abundantly clear that energy and utility companies' business and operations will emerge permanently changed. In the midterm to longer term, providers will likely invest to accelerate a massive increase in sustainable energy provision and to reconfigure infrastructure and operations in the process.

None of these outcomes will be achieved without increased exploitation of digital technologies and continued innovation in energy technologies, such as dispatchable energy storage, hydrogen, carbon capture and storage, and others. Scaled renewable energy requires new asset management technologies; expansion of prosumer generation requires enhancing distributed energy management systems. New renewable power purchase agreements require appropriate contract and trading management systems. Consumers seeking affordable, secure and sustainable energy will adopt energy management and optimization systems, and increasing scrutiny will drive growth in emissions management and reporting tools.

As traditional business and operating models are superseded, older rigid technology architectures will be replaced with modernized and composable technology and architectures that enable greater flexibility, faster decision making and greater resilience. One critical advance will be the increasing adoption of intelligent assets; assets that are highly digitalized, optimize across varied objectives, support autonomous operations and control risk. Communicating networks of intelligent assets will enable intelligent operations – lean, automated and end-to-end processes that simultaneously optimize operations, engineering, maintenance, planning, and business and economic performance for the prevailing market conditions. Oil and gas companies, and power and water utilities that adopt intelligent operations, will achieve competitive advantage and superior performance.

CIOs must quickly create new agility and greater resilience by investing effectively to exploit digital technologies' capabilities at scale. They must begin building the technology foundation for intelligent assets and lay the groundwork to support future intelligent operations. Our research is designed to help CIOs maintain optimal technology investment by understanding:

- How critical and emerging technology markets are evolving and how to develop realistic roadmaps for upgrade and modernization of complex and long-standing legacy systems.
- The challenges and benefits of fast-developing digital technologies and how they can be used to modernize companies' technology portfolios and architectures to create composable enterprises.

Topics

Energy and utility CIOs urgently need to build the technology architectures for evolving business capabilities and the digital foundations for the future enterprise and for intelligent operations. They will need to modernize core systems, assess new vendors and partners, and select appropriate new solutions.

CIOs can use our technology optimization and modernization research to separate hype from reality, establish realistic transformation goals, create appropriate roadmaps and make the right technology investments cost efficiently. We provide guidance and insight into technology maturity and associated deployment risk, as well as insight on leading providers and their offerings in vertical technology markets.

Our research centers on the following topics:

Oil and Gas Technology Optimization and Modernization

Oil and gas markets are in turmoil. Volatility is high, and reliable price forecasting is almost impossible. Earnings are high, but unpredictable, and strategists and planners are acting with great caution. Facing a growing energy transition in the longer term, more oil and gas companies are creating new businesses based on less familiar energy technologies. Our research equips oil and gas CIOs to capitalize on the power of digital technologies, make the case for investment and make informed essential technology-related decisions in a time of high uncertainty.

Questions Your Peers Are Asking

- How should I understand, analyze and prepare for the impact of oil and gas business and technology trends?
- Which technology solutions exist to deliver on oil and gas operational efficiency, increased competitiveness, industry sustainability, and the overall goals of digital transformation?
- How should I adopt, manage and use digital technologies to optimize operations, improve business performance, enable new businesses, and achieve oil and gas enterprise goals?

Recommended Content

🔑 Some recommended content may not be available as part of your current Gartner subscription.

- [ADNOC Builds Agility and Resilience by Executing an Enterprise Digital Strategy](#)
- [Market Guide for Asset Performance Management Software](#)
- [Quick Answer: Why You Need to Consider an Energy Management and Optimization System](#)
- [Quick Answer: Use Cascading KPIs to Get More Enterprise Impact From Innovation Initiatives](#)
- [Innovation Insight for Open Subsurface Data Universe \(OSDU\)](#)

Planned Research

- Identifying short- and long-term trends and their implications for oil and gas companies' technology strategies
- Clarifying digital technologies' role in the design and development of intelligent assets and intelligent operations
- Analyzing the impact of enterprisewide adoption of digital technologies for enhancing operational excellence, productivity and enabling new business models
- Analyzing the technology and market direction for critical energy industry technologies, with Market Guides including:
 - Asset investment planning solutions
 - Asset performance management (APM) software
 - Energy management and optimization systems (EMOSs)
 - Energy trading and risk management systems (ETRM)s
 - Greenhouse gas emissions management solutions
 - Geographic information systems (GISs)
 - Lab information management systems (LIMS)
 - Power purchase agreement management systems
 - Renewable energy management systems (REMS)
 - Weather data systems (WDSs)

Utilities Technology Optimization and Modernization

The world's energy markets are changing rapidly. Providing affordable, secure, sustainable energy and water are urgent imperatives driving the redesign of utility operating and business models. In the short term, utilities are challenged to maintain resilience and ensure the integrity of aging physical infrastructure. In the longer term, accelerating deployment of renewable energy poses additional challenges.

Once-stable and slow-changing utilities are facing radical shifts in operational redesign to become sustainable and resilient agile enterprises. In this environment, technology decisions are ever more consequential.

Utility CIOs and business leaders urgently need to create and develop enterprise strategies and technology investments to direct and enable a balanced shift from current to future operating models.

They also need to find and fund the right technology mix to provide the foundations for future capabilities, capitalize on the opportunities created by emerging energy and water provisioning models, and meet the competition from agile new entrants. Our research equips utility CIOs with the technology-centered insight and guidance for navigating this journey.

Questions Your Peers Are Asking

- How should I understand, analyze and prepare for the impact of utility business and technology trends?
- Which technology solutions exist to deliver operational efficiency, scaling of alternative energy provision, new energy services and the overall goals of digital transformation?
- How should I adopt, manage and use digital technologies to optimize operations, improve business performance, enable new businesses and achieve utility enterprise goals?

Recommended Content

🔑 Some recommended content may not be available as part of your current Gartner subscription.

- [Market Guide for Asset Investment Planning Solutions for Energy and Utilities](#)
- [Vital Digital Technology Investments for Water Utilities](#)
- [Top Practices for Utility CIOs Evaluating Enterprise Asset Management Software](#)
- [Market Guide for Distributed Energy Resource Management Systems](#)
- [Quick Answer: What Are the Core Functions of a Renewable Energy Management System?](#)

Planned Research

- Identifying short and long-term trends and their implications for utilities technology strategies
- Clarifying how digital technologies are enhancing asset and business performance, and enabling the energy transition, with emphasis on low-carbon energy technologies
- Describing the impact and implications of the journey toward intelligent assets and intelligent operations, including the evolution of the digital twin in utilities
- Assessing the shape and scope of energy market data solutions
- Analyzing the technology and market direction for critical industry technologies, including Market Guides for:
 - Advanced distribution management systems
 - APM Software
 - Customer information systems
 - Distributed energy resource management systems
 - EMOS
 - ETRM
 - GISs
 - LIMSs
 - Meter data management systems
 - Mobile workforce management for utilities
 - REMSs
 - WDSs

Suggested First Steps

- [The Impacts of Exponential Renewable Generation Growth Across the Energy Ecosystem](#)
- [Quick Answer: What Are IT/OT Alignment and IT/OT Integration?](#)
- [Quick Answer: The Difference Between Enterprise Asset Management and Field Service Management](#)
- [Quick Answer: What's the Difference Between Computerized Maintenance Management and Enterprise Asset Management Systems?](#)

Essential Reading

- [Market Guide for Renewable Energy Management Systems](#)
- [Market Guide for Advanced Distribution Management Systems](#)
- [Promising and Ambitious Blockchain Initiatives for Digital Transformation in Water Utilities](#)
- [Market Guide for Energy Management and Optimization Systems](#)
- [2022 Strategic Roadmap for Composable Utility Customer Information Systems](#)
- [Infographic: Weather Data Solution Use-Case Prism for Utilities](#)

Acronym Key and Glossary Terms

The energy transition	The global energy sector's structural change in energy provisioning, from relying primarily on fossil fuels – including oil, natural gas and coal – to low-carbon renewable energy sources, such as wind, solar, hydrogen and geothermal.
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Evidence

This initiative leverages data that Gartner analysts collect through primary research and their normal interactions with energy and utility enterprises. This data includes inquiries, vendor briefings, energy and utility industry events, primary and secondary research, interviews, publicly available information, related Gartner surveys, and Gartner published research.

Document Revision History

Energy and Utilities Technology Optimization and Modernization Primer for 2022 - 4 February 2022

Energy and Utilities Technology Optimization and Modernization Primer for 2021 - 11 January 2021

Energy and Utilities Technology Optimization and Modernization Primer for 2020 - 24 January 2020

Utility Foundational Technology Optimization Primer for 2019 - 7 February 2019

Utility Foundational Technology Optimization Primer for 2019 - 7 February 2019

Optimizing Foundational Technology in Utilities Primer for 2018 - 9 January 2018

Optimizing Foundational Technology in Utilities Primer for 2017 - 10 January 2017

Optimizing Foundational Technology in Utilities Primer for 2016 - 29 January 2016

Related Priorities

Initiative Name	Description
CIO Leadership of Culture and People	<div><p>This initiative helps CIOs evolve, acquire, develop and orchestrate diverse technology talent enterprisewide to build digital capabilities, shape culture and future-proof the organization. </p></div>
Technology Finance, Risk and Value Management	We explore technology financial management’s evolution to improve decision making, enable business outcomes, and successfully optimize spend and risk while delivering enhanced organizational value.
E&U Digital Transformation and Innovation	Our resources help companies strategize and execute change to achieve greater resilience, deliver a more sustainable future and align with shifting demands in global energy and water provisioning.

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Technology Finance, Risk and Value Management	<p>We explore technology financial management's evolution to improve decision making, enable business outcomes, and successfully optimize spend and risk while delivering enhanced organizational value.</p>
E&U Digital Transformation and Innovation	<p>Our resources help companies strategize and execute change to achieve greater resilience, deliver a more sustainable future and align with shifting demands in global energy and water provisioning.</p>

Initiative Name	Description
CIO Leadership of Culture and People	<p data-bbox="386 191 521 1020"><div><p>This initiative helps CIOs evolve, acquire, develop and orchestrate diverse technology talent enterprisewide to build digital capabilities, shape culture and future-proof the organization.
</p></div></p>
Technology Finance, Risk and Value Management	<p data-bbox="597 174 699 1020">We explore technology financial management's evolution to improve decision making, enable business outcomes, and successfully optimize spend and risk while delivering enhanced organizational value.</p>
E&U Digital Transformation and Innovation	<p data-bbox="773 159 875 1020">Our resources help companies strategize and execute change to achieve greater resilience, deliver a more sustainable future and align with shifting demands in global energy and water provisioning.</p>