

Application No.: A.08-09-023  
Exhibit No.: SCG – 2-A  
Date: February 11, 2009  
Witness: Edward Fong

**SOUTHERN CALIFORNIA GAS COMPANY**  
**ADVANCED METERING INFRASTRUCTURE**  
**SUPPLEMENTAL TESTIMONY**

***\*\*REDACTED, PUBLIC VERSION\*\****

**Prepared Direct Supplemental Testimony**  
**of**  
**Edward Fong**

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

**February 11, 2009**

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1 **I. BACKGROUND**

2 Per Assigned Commissioner Grueneich’s and Administrative Law Judge (ALJ) Hecht’s  
3 scoping memo and ruling (ACR) issued on January 6, 2009, the following testimony addresses  
4 questions directed to the Southern California Gas Company (SoCalGas or SCG) regarding the  
5 “appropriateness of the SoCalGas choices of communications infrastructure and battery  
6 operation”. Specifically, this chapter will address the questions pertaining to the  
7 communications infrastructure (ACR, pp. 7-8).

- 8 1. What efforts did SoCalGas take to investigate the possibility of sharing  
9 communications infrastructure with SCE or another utility?  
10 2. Would it be technically feasible for SoCalGas to share communications infrastructure  
11 with SCE or another utility?  
12 3. How do the estimated costs for AMI communications infrastructure included in the  
13 application compare with the estimated costs of a system that would utilize SCE  
14 communications infrastructure in the overlapping territories?

14 **II. INTRODUCTION**

15 SoCalGas conducted a business case analysis of Advanced Metering Infrastructure (AMI)  
16 deployment under the presumption that SoCalGas and Southern California Edison’s (SCE) AMI  
17 integration was a viable solution. SoCalGas concluded that an independent AMI solution  
18 (hereinafter the “Stand Alone scenario” or “Stand Alone”) would provide ratepayers  
19 approximately \$137 million more net benefits than a SoCalGas/SCE integrated solution  
20 (hereinafter the “Hybrid scenario” or “Hybrid”). In addition, the Hybrid solution would most  
21 likely mean that SoCalGas would incur the additional cost of integrating at least 2 AMI head-end  
22 technologies to SoCalGas’s meter data management system (MDMS). In other words, although  
23 SoCalGas and SCE could use the same SCE AMI network, each utility would need to maintain  
24 their distinct AMI systems to be synchronized and integrated with each utility’s MDM, asset  
25 management and customer information systems.

26  
27 The following is SoCalGas’ response to the first question posed by the ACR.

1 **III. SOCALGAS INITIAL REVIEW, ANALYSIS AND INVESTIGATION OF AMI**  
2 **PRESUMED INTEGRATION WITH SCE’S AMI COMMUNICATIONS**  
3 **INFRASTRUCTURE.**

4 The Division of Ratepayer Advocates (DRA) approached SoCalGas in September of  
5 2007 to explore the potential of integrating SoCalGas Advanced Metering Infrastructure (AMI)  
6 for gas meters with SCE’s AMI system (Itron’s OpenWay®). SoCalGas conducted a  
7 preliminary investigation and analysis to determine whether AMI for gas meters and potential  
8 integration with SCE’s AMI communications infrastructure was viable.

9 This preliminary review included:

- 10 • Analysis of the overlap service territory (approximately 4 million of SoCalGas’ 6 million  
11 meters by year 2015).
- 12 • Analysis of potential reductions in SoCalGas operating costs (i.e., potential operating  
13 benefits) due to reductions in meter reading expenses and other impacted operations.
- 14 • Investigating and understanding of Itron’s OpenWay® technology, including a high level  
15 exchange of information with San Diego Gas & Electric (SDG&E) as SDG&E,  
16 independently, had also selected the Itron OpenWay® technology for its AMI system.
- 17 • Preparation of preliminary estimates for shared communications infrastructure costs.

18 SoCalGas filed a motion on December 3, 2007 to intervene in SCE’s AMI proceeding,  
19 A.07-07-026, to assure that SoCalGas customers were provided the opportunity to gain potential  
20 benefits from potential integration of gas meter AMI with SCE’s AMI communications network.  
21 Specifically, SoCalGas identified several issues for the Commission to consider potential  
22 integration of SCE and SoCalGas AMI systems. DRA, SoCalGas and SCE recognized that an  
23 analysis of an integrated SCE and SoCalGas AMI system should be conducted.

24 “As previously indicated by SCG in its August 30, 2007 pleading and at the September  
25 26, 2007 Pre Hearing Conference, due to the overlap between SCG’ and SCE’s service  
26 territories, SCG has a general interest in closely monitoring this proceeding and,  
27 depending on further developments in the proceeding, SCG’ interest may evolve into a  
28 more active and participatory role. Indeed, over the last few months, SCG’ interests have  
evolved considerably.

**II. REQUEST FOR RELIEF**

Based on input from the Division of Ratepayer Advocates (DRA) and SCG’s preliminary  
analysis, due to the overlap between the SCE and SCG territory, the most cost effective

1 and efficient manner for SCG to implement Advanced Metering Infrastructure (AMI) for  
2 the approximately 3.6 million SCG customers that are also serviced by SCE will most  
3 likely be a solution that integrates SCE's currently proposed AMI and SCG's as yet  
4 declared AMI prospects. Both DRA and SCG believe that by including SCG potential  
5 AMI in SCE's AMI analysis and design, not only will SCG operational benefits be  
6 achieved, but additional customer benefits will materialize from the availability and  
7 provisioning of gas energy information via the Home Area Network (HAN)  
8 communications protocol implemented via SCE's AMI deployment.

9 DRA and SCG likewise agree that the Commission should evaluate the business case for  
10 integrated SCG/SCE AMI from the single SCG/SCE customer perspective, similar to  
11 those business cases for PG&E and SDG&E which included both electric and gas  
12 meters."<sup>1</sup>

13 In particular, SoCalGas requested the Commission provide SoCalGas and SCE anti-trust  
14 protection so that both parties could share technical information and high level cost estimates  
15 regarding potential AMI integration with SCE's Smart Connect® system.

16 "1) The Anti-Trust Issue: As indicated in Attachment A, to further evaluate an SCG/SCE  
17 integrated AMI solution, SCG propounded a data request to SCE. Based on anti-trust  
18 concerns, SCE was unable to respond to the majority of the data request, leaving SCG  
19 without information that is absolutely critical to evaluating an SCG/SCE integrated AMI  
20 solution. At the September 26, 2007 Pre Hearing Conference, Counsel for SCG did  
21 allude to this anti-trust issue (Transcript at p.6, lines 2-9) and then fully raised it in a  
22 subsequent off the record discussion with Administrative Law Judge (ALJ) Hecht  
23 (Transcript at p.21, line 9), seeking an order in ALJ Hecht's scoping memo ordering SCE  
24 and SCG to share data. Nevertheless, the scoping memo that was ultimately issued on  
25 October 17, 2007 did not make any mention of this request. SCG believes that a  
26 Commission order requiring SCG and SCE to share information and work towards  
27 developing an SCG/SCE integrated AMI solution is critical to overcoming anti-trust  
28 concerns."

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<sup>1</sup> Motion of Southern California Gas Company Requesting Order to Participate in A.07-07-026, pp. 1-2

1 “2) Confidentiality Issue: In addition to the anti-trust issue, SCG anticipates potential  
2 problems with SCE’s ability to share vendor responses to SCE’s AMI Request for  
3 Proposal (RFP) and other confidential data. SCG is not requesting specific vendor  
4 information, costs or specifications regarding vendor technologies. Rather SCG requires  
5 approximate charges or costs for specific AMI components to properly evaluate a  
6 business case for an integrated SCG/SCE AMI solution. Accordingly, SCG also seeks a  
7 Commission order directing SCG and SCE to negotiate appropriate non disclosure and  
8 confidentiality arrangements such that RFP and related data can be shared.”<sup>2</sup>

9 In addition, on January 25, 2008, SoCalGas filed testimony in A.07-07-026 to raise the  
10 policy issues regarding proper treatment of incremental costs that SCE would incur that would be  
11 attributable to potential integration with SoCalGas AMI. As discussed in Section V, the  
12 Commission did not make a formal determination during that proceeding. Thus, the issue of  
13 shared communication infrastructure clearly raises questions as to which utility ratepayers will  
14 pay for incremental one-time and on-going costs due to the potential integration of SoCalGas  
15 AMI with SCE’s Smart Connect® OpenWay® network.<sup>3</sup>

16 SoCalGas conducted discussions with SCE during the first half of 2008 to gain  
17 understanding of potential technical, process and pricing/cost sharing issues as well as exploring  
18 the maturity and readiness of SCE’s AMI OpenWay® technology to read gas and water meters  
19 from a different entity. In addition, potential technical and capacity issues were raised in these  
20 discussions. In so doing, SoCalGas began to understand the complexity of technical integration,  
21 pricing and inter-utility cost allocation issues for shared infrastructure that the Commission  
22 would ultimately need to address.

23 Furthermore, SoCalGas has consulted with SCE, Itron and SDG&E to understand Itron’s  
24 OpenWay® technology architecture. SoCalGas has actively participated in SCE’s Contract  
25 Meter Reading workshops.<sup>4</sup>

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26 <sup>2</sup> IBID, pp. 2-3

27 <sup>3</sup> Prepared Direct Testimony of Ed Fong on Behalf of Southern California Gas Company, A.07-07-026, January 25,  
2008

28 <sup>4</sup> Commission approved SDG&E’s AMI in D.07-04-043 and SCE’s AMI in D.08-09-039.

1 **SoCalGas proceeded with the presumption that integration of SoCalGas AMI with SCE's**  
2 **AMI communications network was viable and issued a request-for-proposal in May 2008 to**  
3 **AMI technology vendors, information systems integrators and gas module installation**  
4 **vendors.**

5 Based on SoCalGas' (1) motion to intervene and submission of prepared direct testimony  
6 in A.07-07-026; (2) exchange of information with SDG&E regarding its electric and gas  
7 integration experience using Itron's OpenWay® technology which is identical to that used by  
8 SCE; and (3) discussions with SCE AMI subject matter experts on technical and capacity  
9 considerations, SoCalGas made a presumption that the Hybrid scenario would be the first  
10 scenario to be analyzed. SoCalGas explicitly required in its May 2008 request-for-proposals  
11 (RFP) that vendors provide a proposal and cost estimates for the Hybrid scenario.

12 The comprehensive analysis of vendor cost comparisons demonstrated that the Hybrid  
13 scenario was less cost effective compared to the Stand Alone scenario. SoCalGas included cost  
14 estimates that were derived from SDG&E's AMI experience integrating electric and gas meters  
15 but did not include certain SCE charges or fees not yet quantified, including incremental SCE  
16 costs, allocation of cost for shared AMI assets, or SCE's lost capacity and reduced benefits. In  
17 other words, even without including these additional material SCE costs, the Hybrid scenario is  
18 significantly more expensive and provides \$137 million less net benefits (present value) than the  
19 Stand Alone scenario as shown in my prepared direct testimony, Chapter II, Tables II-2 and II-3,  
20 pp. II-3 and II-4. See Table EFS-II below for a breakdown of the specific cost and benefit  
21 elements defined for the Hybrid versus Stand Alone scenarios for the 4 million meter  
22 SCE/SoCalGas overlap service territory.

23 Table EFS-II also does not include the additional SoCalGas integration costs required for  
24 at least 2 AMI head-end systems. Specifically, a systemwide AMI solution would cover all 6  
25 million SoCalGas customers. Therefore, the complete Hybrid scenario would require an  
26 additional AMI technology solution that would be applicable to the 2 million SoCalGas  
27 customers that are not in the SCE/SoCalGas overlap territory. The Hybrid solution's total cost  
28

1 for SoCalGas 6 million meters includes incremental costs associated with integrating at least 2  
2 AMI head-end systems. (See Mr. Olmsted’s prepared direct testimony, Chapter IV.)

3 **SoCalGas and several water agencies, municipalities, utilities and other water entities have**  
4 **discussed the plan for installing an AMI system.**

5 SoCalGas conducted discussions with the following water entities and has expressed a  
6 strong desire to collaborate and share knowledge with water entities that are planning water AMI  
7 systems. SoCalGas believes the current AMI technologies that are being evaluated, and that will  
8 ultimately be deployed, can successfully read both gas and water meters. As mentioned above,  
9 SoCalGas participated in SCE’s Contract Meter Reading workshops. In addition, a major AMI  
10 technology vendor conducted an analysis of shared efficiencies between SoCalGas and a large  
11 water district in Orange County.

12 **Table EFS-I**  
13 **Water Agency and Entity Contacts**

14 **Water Agencies & Utilities Contacted Regarding Potential AMI**

15 <b>Agency Contacted</b>	16 <b>Timeframe</b>	17 <b>Type Of Contact</b>
18 California American Water	19 May 2008	20 Telephone
21 City of Glendale	22 June 2008	23 Presentation
24 Metropolitan Water District, Southern California	25 June 2008	26 Presentation
27 Metropolitan Water District, Central Basin	28 June 2008	Telephone
Metropolitan Water District, Orange County	June 2008	Presentation
Bureau of Reclamation Project Advisory Committee	July 2008	Presentation
Coachella Valley Water District	August 2008	Presentation
Golden State Water Company	August 2008	Presentation

25 The following is SoCalGas’ response to the second question posed by the ACR.  
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1 **IV. SIGNIFICANT TECHNICAL HURDLES MUST BE OVERCOME FOR**  
2 **SOCALGAS INTEGRATION WITH SCE’S SMART CONNECT® USING**  
3 **ITRON’S OPENWAY®. THE TECHNOLOGY IS NOT READY TO**  
4 **INCORPORATE SEPARATE ELECTRIC AND GAS READS FROM TWO**  
5 **DIFFERENT COMPANIES.**

6 **Significant changes/enhancements would be required to SCE’s head-end and meter data**  
7 **management system (MDMS) to allow full integration of SoCalGas gas meter/modules with**  
8 **a corresponding SCE Smart Connect® electric meter in the overlap territory. SCE**  
9 **network design will not cover all of SoCalGas customers.**

10 Itron’s OpenWay® technology architecture is based on a mesh network of electric meters  
11 (nodes) communicating with one another to pass data to a collector or “cell relay” meter that will  
12 transmit meter information to SCE’s host head-end and MDM systems. Gas meters, water  
13 meters, or other devices that use Itron’s OpenWay® communications infrastructure must be  
14 associated with an electric meter and registered on the network. In other words, for a gas meter  
15 to communicate usage information back to SoCalGas, the gas communications module must  
16 communicate and be “registered” with an SCE electric meter (non-cell relay meter). The SCE  
17 electric meter will then “hop” on the electric meter mesh network and find a “path” to a cell relay  
18 meter. The cell relay meter will gather meter reads from several hundred other electric meters  
19 before transmitting information from the several thousand devices (electric meters, gas modules,  
20 water modules, programming communicating devices (PCDs) associated with an electric meter)  
21 to SCE’s head-end system. The complexity of the current OpenWay® technical architecture  
22 would require significant changes to track and verify different SoCalGas company devices  
23 (assets) on SCE’s AMI network and would, consequently, reduce SCE’s capacity for additional  
24 in-home HAN devices that may be controlled through SCE’s AMI network. SCE outlines the  
25 technical issues that must be considered before SCE can provide a contract meter reading service  
26 offering with their AMI technology. These issues include data communications protocols,  
27  
28

1 bandwidth requirements, data security, etc. Even more succinctly, SCE describes AMI  
2 integration with gas and water meters as not a “cookie cutter” service offering.<sup>5</sup>

3 **An additional 3-4 years would be needed for Itron, SCE and SoCalGas to enhance and**  
4 **develop systems that will integrate SoCalGas gas modules with SCE’s Itron OpenWay®**  
5 **technology.**

6 Itron’s current head-end system will require significant modification to delineate the data  
7 (meter reads) between SoCalGas and SCE. The exact technical specifications and business  
8 functional requirements would need to be determined. Specifically, SCE’s Quarterly Automated  
9 Contract Meter Reading (CMR) Workshop held on October 8, 2008 identified four major  
10 technical integration issues:

11 “(i) the ability for electric meters to communicate gas/water meters through  
12 different barriers (distance, walls, vaults, etc.); (ii) device registration and asset  
13 management issues; (iii) utilization issues for processor/memory of SCE’s meter;  
14 and (iv) the back office systems integration between utilities.”<sup>6</sup>

15 Specifically, SCE’s MDMS would require enhancement to include SoCalGas asset  
16 management information to track, control, reconcile and register changes (new or replacement)  
17 in SoCalGas gas modules. The exchange of asset component information (including asset type,  
18 location, serial numbers, firmware releases, etc.) is an essential interface between MDMS and  
19 head-end systems. Security and protection of utility specific data has not been addressed nor  
20 designed into SCE’s system at the electric meter, cell relay, head-end or MDMS levels.<sup>7</sup>

21 Preliminary estimated cost required for enhancements to head-end system software and  
22 MDMS are included in SoCalGas’s Hybrid scenario cost estimates. Technical resolution of the  
23 issues identified above and implementation of related head-end and MDMS enhancements  
24 cannot even begin for several years.<sup>8</sup> Even more explicitly, the Technology Panel at SCE’s

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25 <sup>5</sup> Opening Brief of Southern California Edison Company (U338-E) On Issues Related to Third-Party Use of  
Advanced Metering Infrastructure, A.07-07-026, April 4, 2008, p.4.

26 <sup>6</sup> Edison SmartConnect™ Quarterly Automated Contract Meter Reading Workshop, October 8, 2008, La Palma,  
CA, Workshop Report, pp. 6-7.

27 <sup>7</sup> IBID, p. 10

28 <sup>8</sup> IBID, p. 7

1 CMR workshop stated that “there are no utilities who can offer automated contract meter reading  
2 to another utility immediately.”<sup>9</sup>

3 See Section IV below for the itemized incremental costs associated with the Hybrid scenario.  
4

5 **Potential integration of SoCalGas gas modules with SCE’s Itron OpenWay® will not**  
6 **address 2 million SoCalGas meters in the non-SCE overlap territory or those gas modules**  
7 **that maybe orphaned within the existing SCE network.**

8       Regardless of the potential for technical integration of different utility devices on SCE’s  
9 Itron OpenWay® technology, SoCalGas must still find an AMI solution for the remaining 2  
10 million SoCalGas customers with meters that are not in SCE’s overlap territory. In addition,  
11 SCE has estimated that certain SCE electric meters will not be connected to the Itron OpenWay  
12 network. Thus, even within the SoCalGas/SCE overlap territory, SoCalGas must find a non-  
13 Hybrid Itron Open Way® AMI solution for some meters.<sup>10</sup> If SoCalGas were to integrate with  
14 SCE’s AMI system, SoCalGas would likely need to install three AMI solutions (i.e., SCE Itron’s  
15 Open Way, SCE non-Itron sites, and the non-SCE overlap territory). The complexity of  
16 integration associated with multiple AMI networks, head-end solutions and inter-company  
17 MDMS is greater than an AMI system that is independent upon the location of electric meters  
18 from a different entity (or entities).

19       The attached map shows that SoCalGas and SCE meters do not overlap in a contiguous  
20 geographical manner.<sup>11</sup> Thereby, several densely populated areas in the middle of SoCalGas  
21 service territory are not served by SCE (e.g., City of Los Angeles, Pasadena, Burbank, Glendale  
22 and Anaheim). Even in the Hybrid scenario, two separate AMI communication systems will  
23 overlap in boundary areas of SCE and SoCalGas meters in the non-SCE areas.  
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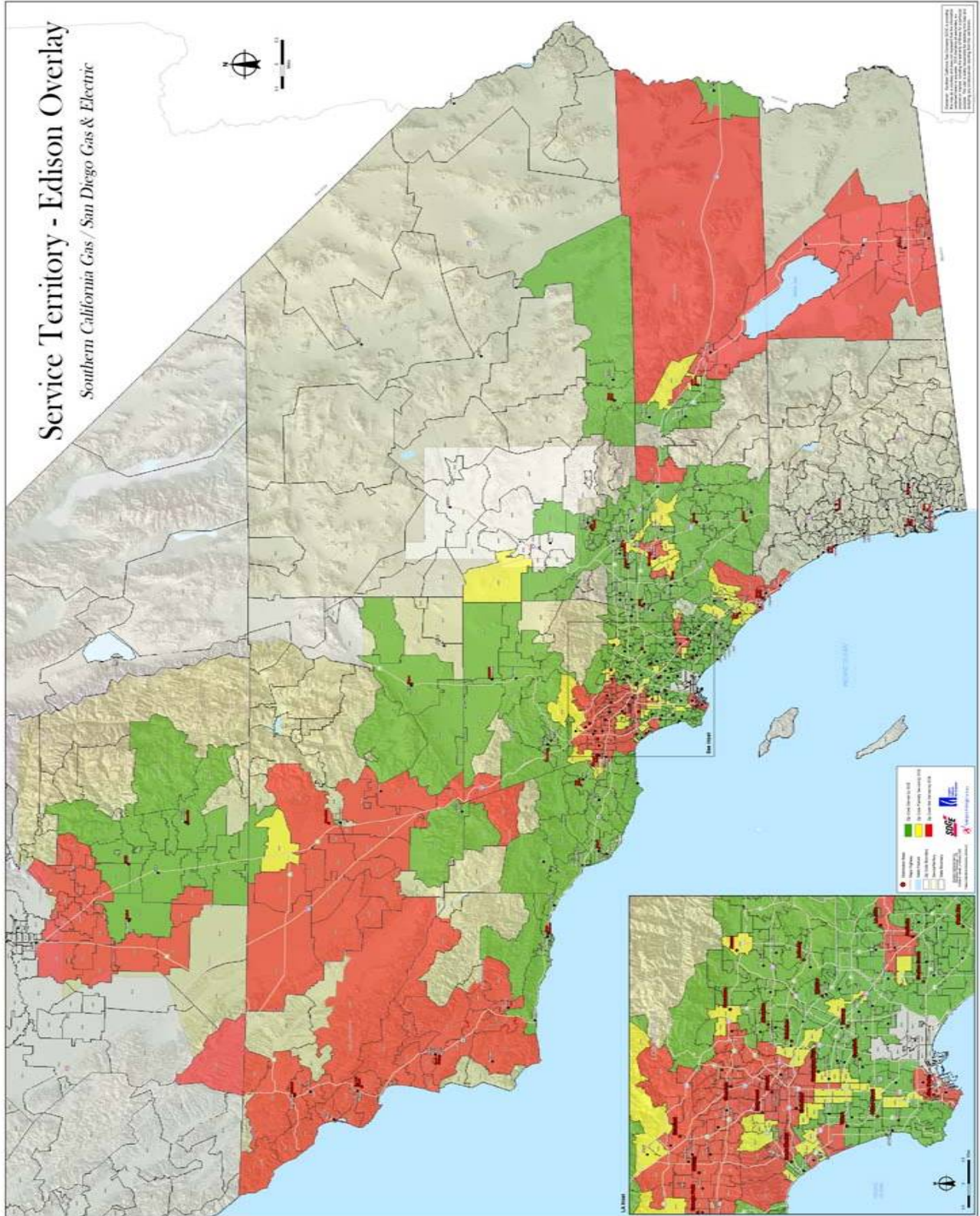
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25 <sup>9</sup> IBID, p. 10

26 <sup>10</sup> Edison SmartConnect™ Quarterly Automated Contract Meter Reading Workshop, June 11, 2008, La Palma, CA,  
27 Workshop Report, p. 6.

28 <sup>11</sup> As indicated in the legend to the attached map, green-shaded areas denote zip codes served by SCE, yellow-  
shaded areas are zip codes partially served by SCE, and red-shaded areas are zip codes not served by SCE.

Figure EFS – 1  
SoCalGas and SCE Service Territory



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2 SoCalGas would necessarily incur the incremental cost associated with potentially  
3 implementing 3 separate AMI communication infrastructures from 3 different vendors. Each  
4 would have separate AMI head-end systems that must interface with a single SoCalGas MDMS.  
5 In addition, the SCE MDMS would almost certainly require a major interface with SoCalGas'  
6 asset management system and an interface with SoCalGas' MDMS. Designing and developing  
7 these interfaces between large and complex information systems are significant projects in and of  
8 themselves.

9 **The addition of SoCalGas gas modules to SCE's AMI network will necessarily reduce**  
10 **SCE's flexibility on its mesh network and customer capabilities due to AMI electric meter**  
11 **limitations.**

12 Itron's OpenWay® current electric meter has a limit on the number of devices that can be  
13 registered on a single electric meter. Adding a gas module that must be registered with an  
14 electric meter will reduce SCE's flexibility to register additional customer devices (e.g.,  
15 programming communicating devices, customer submeters for solar generation, future plug-in  
16 hybrids, etc.). Future expansion of capacity must be planned and the attributable marginal cost  
17 of such incremental capacity must be allocated to the entity causing the incremental capacity  
18 utilization.<sup>12</sup> In the case where a SoCalGas meter is occupying one of SCE's registers, SoCalGas  
19 would need to compensate SCE for the "opportunity cost" (or the lost benefit) of reducing the  
20 number of available registers.<sup>13</sup>

21 In addition, if because of network and meter control purposes, a gas meter must be  
22 "steered" to the same premise (resident's) electric meter, then additional costs may be incurred  
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25 \_\_\_\_\_  
26 <sup>12</sup> Edison SmartConnect™ Quarterly Automated Contract Meter Reading Workshop, October 8, 2008, La Palma,  
CA, Workshop Report, p. 6.

27 <sup>13</sup> Opening Brief of Southern California Edison Company (U338-E) On Issues Related to Third-Party Use of  
Advanced Metering Infrastructure, A.07-07-026, April 4, 2008, pp. 4-5.

1 for gas communication repeaters. The requirements for additional communication repeaters in  
2 the “steered” path scenario are identified in an Itron whitepaper.<sup>14</sup>

3 The following is SoCalGas’ response to the third question posed by the ACR.

4 **V. SOCALGAS CONDUCTED A COMPARISON ANALYSIS OF COSTS AND**  
5 **BENEFITS BETWEEN A “STAND ALONE” AMI SYSTEM AND A “HYBRID”**  
6 **AMI SYSTEM (INTEGRATION WITH SCE’S AMI AND SEPARATE AMI**  
7 **SYSTEM FOR THE NON-SCE OVERLAP TERRITORY).**

8 Table EFS-II delineates in greater detail the comparison table presented in my prepared  
9 direct testimony (Chapter 2, Tables II-2 and II-3, pp. II-3 and II-4). Specifically, Table EFS-II  
10 below compares the costs of AMI for **4 million gas meters** in the SoCalGas/SCE overlap service  
11 territory for the Stand Alone scenario with the Hybrid scenario. Note the total cost for AMI  
12 deployment for the Hybrid scenario that includes SoCalGas’ 6 million gas meters is identified in  
13 my prepared direct testimony, Chapter II and in SCG AMI Workpaper for Chapter 2 – Hybrid vs  
14 Stand Alone Scenario Comparison. The major differences in cost between the Hybrid and Stand  
15 Alone Scenarios are:

- 16 • Reduced SoCalGas capital cost for the communications network, related head-end  
17 servers for the Hybrid scenario;
- 18 • Increased SoCalGas capital cost for gas module communications repeaters;
- 19 • Increased one-time SoCalGas cost for incremental SCE integration expenses,  
20 including additional cell relay meters, head-end server capacity and MDMS capacity;
- 21 • Reduction in SoCalGas pole agreement expenses; and
- 22 • On-going incremental SCE cost for increased license fees for end-point additions to  
23 the head-end software, gas data transmission and other operations and maintenance  
24 that is end-point dependent.

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27 <sup>14</sup> “Zigbee® Smart Energy Join Procedures for 2.4 GZ OpenWay® Gas Modules”, Itron Whitepaper,  
28 OpenWay®Zigbee® Smart Energy Profile Join Procedures, 2008, Itron Inc. “Steered” means a pre-defined path.

**Table EFS-II<sup>15,16</sup>**  
**Total Project Life Cycle Cost and Benefits 2009-34**  
**SoCalGas/SCE Overlap Territory Only – 4 Million Meters**  
 (Undiscounted thousands of dollars)

Key	Cost Element	Hybrid	Stand Alone	Difference
AA	Capital - Network	\$25,033	\$58,347	(\$33,314)
A	Capital - IT + Mtr Read & Cust Svc Field RF/HH devices	\$102,885	\$114,912	(\$12,028)
B	Capital - Meters and Modules	\$533,340	\$514,656	\$18,684
C	Capital - Project Management Office	\$18,650	\$18,650	\$0
D	Capital - Facilities	\$0	\$0	\$0
E	Capital - Gas Transmission & Distribution (Pipeline & Compressor)	\$57,900	\$57,900	\$0
F	Capital - Contingency	\$55,610	\$57,390	(\$1,780)
G	O&M - Billing	\$7,956	\$7,956	\$0
H	Working Cash (theft portion)	\$0	\$0	\$0
I	Working Cash (billing portion)	\$0	\$0	\$0
J	O&M - Customer Contact Center	\$210	\$210	\$0
K	O&M - Customer Service Field	\$307,422	\$307,422	\$0
L	O&M - Customer Communications	\$7,911	\$7,911	\$0
M	O&M - Facilities	\$0	\$0	\$0
N	O&M - Information Technology	\$81,456	\$81,456	\$0
O	O&M - Meter Reading	\$7,354	\$7,354	\$0
P	O&M - Network Related (including Pole Leases)	\$54,781	\$117,618	(\$62,837)
Q	O&M - Project Management Office	\$17,193	\$17,045	\$148
R	O&M - Postage	\$0	\$0	\$0
S	O&M - Administrative & General	\$0	\$0	\$0
T	O&M - Gas Transmission & Distribution (Pipeline & Compressor)	\$185	\$185	\$0
U	So Cal Edison Payments - one time	\$18,849	\$0	\$18,849
V	So Cal Edison Payments - ongoing	\$420,406	\$0	\$420,406
W	O&M - Conservation	\$0	\$0	\$0
X	O&M - Terminal Value	\$0	\$0	\$0
Y	O&M - Contingency	\$17,694	\$12,321	\$5,373
Z	O&M - Carbon Dioxide (CO2)	\$0	\$0	\$0
<b>Subtotal Costs</b>		<b>\$1,734,837</b>	<b>\$1,381,335</b>	<b>\$353,502</b>

<sup>15</sup> Table EFS-II shows cost and benefit elements for the complete project life cycle (2009-2034) in undiscounted, fully loaded, escalated and taxed amounts. The first column (key) is a reference to supporting workpapers that show the detailed cost elements (Excel spreadsheet, Column CE, drop selection menu).

<sup>16</sup> Workpaper EFS-160 is the response provided to DRA DR-19, question 2b and is provided under a confidential document pursuant to PUC Code Section 583 & General Order 66-C.

	<b>Key</b>	<b>Benefit Element</b>	<b>Hybrid</b>	<b>Stand Alone</b>	<b>Difference</b>
1	AA	Capital - Network	\$0	\$0	\$0
	A	Capital - IT + Mtr Read & Cust Svc Field RF/HH devices	\$15,360	\$15,360	\$0
	B	Capital - Meters and Modules	\$129,271	\$130,416	(\$1,145)
2	C	Capital - Project Management Office	\$0	\$0	\$0
	D	Capital - Facilities	\$9,724	\$9,724	\$0
	E	Capital - Gas Transmission & Distribution (Pipeline & Compressor)	\$56,649	\$56,649	\$0
3	F	Capital - Contingency	\$0	\$0	\$0
	G	O&M - Billing	\$82,884	\$91,418	(\$8,534)
4	H	Working Cash (theft portion)	\$2,387	\$2,387	\$0
	I	Working Cash (billing portion)	\$42,011	\$42,011	\$0
	J	O&M - Customer Contact Center	\$7,075	\$7,075	\$0
5	K	O&M - Customer Service Field	\$447,245	\$447,245	\$0
	L	O&M - Customer Communications	\$0	\$0	\$0
6	M	O&M - Facilities	\$0	\$0	\$0
	N	O&M - Information Technology	\$0	\$0	\$0
	O	O&M - Meter Reading	\$1,062,158	\$1,062,158	\$0
7	P	O&M - Network Related (including Pole Leases)	\$0	\$0	\$0
	Q	O&M - Project Management Office	\$0	\$0	\$0
8	R	O&M - Postage	\$4,042	\$4,042	\$0
	S	O&M - Administrative & General	\$15,947	\$15,947	\$0
	T	O&M - Gas Transmission & Distribution (Pipeline & Compressor)	\$180	\$15,345	(\$15,165)
9	U	So Cal Edison Payments - one time	\$0	\$0	\$0
	V	So Cal Edison Payments - ongoing	\$0	\$0	\$0
10	W	O&M - Conservation	\$386,426	\$386,426	\$0
	X	O&M - Terminal Value	\$123,038	\$164,998	(\$41,961)
	Y	O&M - Contingency	\$0	\$0	\$0
11	Z	O&M - Carbon Dioxide (CO2)	\$19,626	\$19,626	\$0
		<b>Subtotal Benefits</b>	<b>\$2,404,024</b>	<b>\$2,470,827</b>	<b>(\$66,803)</b>
12		<b>Net Benefits</b>	<b>\$669,187</b>	<b>\$1,089,492</b>	<b>(\$420,305)</b>

14 Cost estimates for several SCE integration activities, on-going services, incremental  
15 capacity requirements, foregone SCE benefits, and opportunity costs have not been included in  
16 the above comparison. Other costs that would require SCE service fees would include joint  
17 meter/asset trouble shooting/problem resolution, meter maintenance (electric meter maintenance  
18 due to gas module integration) and firmware upgrades. However, even without such cost  
19 estimates, the SoCalGas Stand Alone AMI scenario is a more cost effective alternative for  
20 SoCalGas customers. Note that any incremental costs incurred by SCE that is attributable to  
21 SoCalGas should be charged to SoCalGas ratepayers.



**Table EFS-III  
Other SoCalGas/SCE AMI Integration Costs – Not Quantified**

<b>Additional Network Integration Cost Elements</b>	
<b>Network Integration</b>	Repeater replacements - 15 years  Remote diagnostics requirements impacting host utility operations  Solution to read meters where host utility will not have AMI; "orphaned meters" (SCE estimates that certain electric meters will not be OpenWay)
<b>Back-office Integration</b>	Back-to-back infrastructure required for data exchange (utility to utility dedicated telephone line or equivalent)  On-going maintenance costs of asset management information populating the host utility MDMS
<b>End-Point Deployment &amp; Integration</b>	Coordination of installation & provisioning work; complexity of systems synchronization

The above list of additional cost elements is not an exhaustive list of additional costs that may result from integration of SoCalGas gas modules with the SCE AMI network. SCE costs that may be allocated to SoCalGas for certain shared assets are not included.

**SoCalGas is planning to implement AMI technology that will not depend on the electric meter for multiple end-point meter integration for gas meters. However, the AMI technology will be able to read electric, gas and water meters through the AMI communications network.**

SoCalGas is well into AMI technology vendor assessment, evaluation and selection via its request-for-proposal (RFP) process. Several established AMI technologies have demonstrated capabilities (i.e. have actual installations) that can read water and/or gas meters without the requirement of passing such reads through an electric meter. These AMI technologies have collection (take-out) points that have direct communications between the data collector/transceiver and each end-point meter/module.

1 Specifically, Attachment 1 (not included in redacted version of testimony) shows the  
2 water meter installations of short listed respondents to SoCalGas AMI technology RFP.

3  
4 **Unique AMI systems do not lead to higher incremental costs, but could very well be the  
5 lowest cost solution.**

6 SCE's Automated CMR on October 8, 2008 succinctly depicted the situation of electric,  
7 gas and water utilities that were not entirely overlapping and showed that unique AMI systems  
8 do not necessarily lead to higher costs, but could avoid the significant costs in integration of  
9 "control and synchronization systems".<sup>17</sup> SCE also points to the case of Pacific Gas & Electric's  
10 implementation of separate gas and electric AMI systems.<sup>18</sup>

11 **If the Commission requires additional analysis of specific incremental costs for a SoCalGas  
12 and SCE AMI integration, then the Commission must decide on a cost allocation  
13 methodology for shared assets, allocation of incremental technical and project risks,  
14 valuation of opportunity costs, valuation of lost SCE operating benefits, and full cost  
15 recovery for SoCalGas and SCE as result of incurring additional costs and risks.**

16 With regards to the SCE AMI decision, D.08-09-039, pages 46-51 covers the issue of  
17 SCE providing AMI service to third parties. It states that

18 "In order to ensure that the charges for automated meter reading services reflect the  
19 costs of providing those services, we find that the appropriate charges for services  
20 should be provided on a contract basis, rather than through a tariff, with appropriate  
21 charges determined through negotiation by the parties to the contract. Any contract  
22 for automated meter reading services between SCE and another Commission-  
23 jurisdictional utility shall be submitted to the Commission for review through a  
24 future application. We agree that the charges for these services provided in a contract  
25 should include the incremental cost of providing the services, but it is not necessary  
26 to decide here whether those costs should be limited to incremental costs of  
27 providing the service or should include a portion of the system's fixed costs." (pp.  
28 50-51).<sup>19</sup>

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25 <sup>17</sup> Edison SmartConnect™ Quarterly Automated Contract Meter Reading Workshop, October 8, 2008, La Palma,  
26 CA, Workshop Report, Presentation by Elster's Murray Royce, Slide # 4

27 <sup>18</sup> Opening Brief of Southern California Edison Company (U338-E) On Issues Related to Third-Party Use of  
28 Advanced Metering Infrastructure, A.07-07-026, April 4, 2008, p.5.

<sup>19</sup> SCE's AMI in D.08-09-039, FF 30-32 and COL 4-5.

1 D.08-09-039 provides only broad guidance that contract meter reading services should be  
2 charged at incremental costs. However, the specific methodology for determining incremental  
3 costs and related loaders is undefined. Moreover, D.08-09-039 leaves open how “fixed costs”  
4 should be allocated. Specifically, does “fixed costs” only include shared assets between utilities  
5 or does the Commission intend to include total assets? Regardless of the cost methodology  
6 applied, SoCalGas conducted a conservative assessment of the Hybrid scenario costs by  
7 including the minimum cost elements that are known or extrapolated from the SDG&E  
8 experience in the Hybrid scenario.

## 9 **VI. CONCLUSION**

10 SoCalGas has demonstrated that the analysis of a Hybrid scenario with an integrated SCE  
11 and SoCalGas AMI communications network is not cost effective for SoCalGas and SCE.  
12 SoCalGas initially proceeded with a business case analysis presuming an integrated SCE and  
13 SoCalGas AMI communications network. The analysis to date only includes costs that  
14 SoCalGas could reliably estimate from SDG&E’s AMI experience and technical knowledge  
15 using identical SCE AMI technology. SoCalGas’s analysis does not include all of the potential  
16 additional incremental costs and lost benefits that SCE may incur with integration of SoCalGas  
17 gas modules. The potential savings from using the SCE AMI network is far less than the  
18 additional “costs to achieve” the systems integration necessary to synchronize asset management  
19 systems with the AMI meter data management and head-end systems. Finally, additional cost  
20 would be incurred to integrate a second AMI technology and communications network for the 2  
21 million gas meters in the non-SCE overlap territory and also for meters that are orphaned within  
22 the existing SCE network. SoCalGas concludes that a Stand Alone AMI system is the most  
23 prudent business option.

24 This concludes my prepared direct supplemental testimony.

**ATTACHMENT 1**

**Attachment is a confidential document pursuant to PUC Code Section 583 & General Order 66-C**