

Application of San Diego Gas & Electric Company  
(U-902-E) for Adoption of an Advanced Metering  
Infrastructure Deployment Scenario and Associated Cost  
Recovery and Rate Design.

Application 05-03-015

Exhibit No.: \_\_\_\_\_

**CHAPTER 8  
SUMMARY OF AMI IMPLEMENTATION AND OPERATIONS**

**JULY 14, 2006 AMENDMENT**

**Prepared Supplemental, Consolidating,  
Superseding and Replacement Testimony**

**of**

**TED M. REGULY**

**SAN DIEGO GAS & ELECTRIC COMPANY**

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

**July 14, 2006**

***Material changes to this testimony can be found on pages: 1 and 10***

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3 **II. BACKGROUND**

4 **A. The State's Functional Criteria/Policy Goals**

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5 As part of the R.02-06-001 rulemaking, the CPUC, in conjunction with the  
6 CEC, provided policy direction regarding the minimum level of system  
7 functionality that should be supported by an AMI for purposes of analyzing a full-  
8 scale AMI deployment. Specifically, guidance was given that the AMI system  
9 functionality requirements are driven by the type of rate structures and programs  
10 the system is expected to support. Mindful of the Commission's guidance,  
11 SDG&E is fully committed to seeking an AMI system that will maximize the  
12 amount of demand response and operational benefits that can be achieved cost  
13 effectively.

14 In developing SDG&E's AMI proposal, SDG&E rigorously assessed the AMI  
15 marketplace, seeking systems capable of fulfilling the following six policy goals  
16 (or functional requirements).<sup>3</sup>

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- 17 1. Implementation of the following price responsive tariffs for:
- 18 a. Residential and Commercial Customers on an opt out basis:
- 19 i. Two or three period time-of-use (TOU) rates with ability to change  
20 TOU period length;
- 21 ii. Critical peak pricing with fixed (day ahead) notification (CPP-F);
- 22 iii. Critical peak pricing with variable or hourly notification (CPP-V)  
23 rates;
- 24 iv. Flat / inverted tier rates.
- 25 b. Large customers (200kW to 1MW) on an opt out basis:
- 26 i. Critical peak pricing with fixed or variable notification;
- 27 ii. Time-of-use;
- 28 iii. Two part hourly real-time pricing.

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<sup>3</sup> Joint Assigned Commissioner and ALJ's Ruling Providing Guidance for the Advanced Metering Infrastructure Business Case Analysis' of February 19, 2004, p. 3, 4.

- c. Very large customers (over 1MW) on an opt out basis:
  - i. Two part hourly real-time pricing;
  - ii. Critical peak pricing with fixed or variable notification;
  - iii. Time-of-use pricing.
2. Interval usage data collection that supports customer understanding of hourly usage patterns and how those usage patterns relate to energy costs;
3. Customer access to personal energy usage data that can support customer changes in preference without additional AMI system hardware costs;
4. Compatibility with customer education and energy management applications, customized billing and improved complaint resolution;
5. Compatibility with other utility system applications that promote operating efficiency and service reliability; and,
6. Capable of interfacing with load control communication technology.

Additionally, SDG&E's AMI technology solution will at a minimum:

- a. Be a technology independent, next generation solution supporting:
  - i. Open architecture;
  - ii. Fully upgradeable;
  - iii. Scalability;
  - iv. Flexibility; and
  - v. A complete end-to-end solution.
- b. Be fully integrated with existing operational infrastructures.
- c. Be able to support additional functionality at a later date without the need for significant additional systems hardware.

#### **B. SDG&E Filed its Preliminary AMI Business Case.**

On March 15, 2005, SDG&E filed with the Commission its preliminary AMI business case (A.05-03-015). Although the case submitted was based on the best available information at the time, SDG&E did not have the benefit of a completed Request for Proposal (RFP) process. On August 25, 2005, the Commission issued D.05-08-018, granting SDG&E approval for AMI pre-deployment funding of \$9.3 million in order to perform an extensive RFP process, ~~solicits~~ vendor AMI proposals and other activities as detailed in the multi-party settlement agreement

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1 attached to the decision. This supplemental testimony includes costs obtained  
2 from RFP replies.

3 The pre-deployment funding allows SDG&E to evaluate several AMI  
4 technologies through field tests. This funding also supports the necessary  
5 activities to prepare for mass meter installation, systems readiness for meter  
6 changes and systems interfaces to translate meter reads for collection, billing,  
7 outage management, customer energy presentment, and service order processing.  
8 From June 2005 through March 2006, SDG&E has committed time and resources,  
9 both internally and externally, to identify an AMI solution that can achieve the  
10 estimated benefits for the stated not-to-exceed costs. Cost estimates are based on,  
11 and will not exceed the higher of, the solution set costs derived from the RFP  
12 process. The final costs however, may be less than the higher of the solution set  
13 costs.

### 14 **III. SUMMARY OF IMPLEMENTATION AND OPERATIONS**

#### 15 **A. SDG&E Proposes a Full Deployment of AMI Balanced by Prudent Risk** 16 **Mitigation.**

17 Utilizing union labor, SDG&E proposes to deploy an AMI system including  
18 approximately 1.4 million electric meters and 900,000 gas meters over  
19 approximately 2.5 years. As required by the RFP, by December 2010, the  
20 deployed AMI system will cover 99.5% of SDG&E's meters. SDG&E has  
21 completed a comprehensive project risk assessment and mitigation process in  
22 preparing for AMI implementation. The risk management data and background  
23 regarding loss prevention, exposure avoidance, and risk diversification is  
24 discussed in more detail in Chapters 9 – 12. To develop mitigation approaches  
25 that protect SDG&E and its customers, SDG&E: 1) employed subject matter  
26 experts, and 2) utilized internal and external benchmark data to identify real and  
27 potential risks. This process resulted in a range of risk management steps  
28 including:

- 29 1. The adoption of a "Design, Build, Run, Transfer" approach. This  
30 approach will include detailed Service Level Agreements that require the  
31 AMI communication system vendors to maintain responsibility throughout  
32 the full deployment period and for a minimum of six months thereafter.

- 1           2. Execution of a rigorous RFP process that will result in the evaluation of
- 2           proven technologies coupled with field tests to ensure full scalability prior
- 3           to selecting vendors for communications technology, systems and
- 4           software technology, and meter procurement and installation.
- 5           3. Completion of quality reviews of each vendor to ensure adequate capacity
- 6           capabilities to minimize possible supply chain disruption.
- 7           4. Execution of a contractual agreement with an established, project
- 8           management vendor versed in implementing AMI solutions. Further,
- 9           SDG&E intends to incorporate a joint project management organization
- 10          utilizing proven project management tools and techniques for managing
- 11          supply chain, field activities and back office exceptions.
- 12          5. The intention to specify AMI contractual conditions and requirements that
- 13          will provide the greatest protection against AMI technology and software
- 14          vendors that do not meet their technical and contractual requirements.
- 15          6. Employment of a buy-as-opposed-to-build philosophy to ensure
- 16          efficiency, cost containment, schedule compliance, and benefit realization
- 17          from vendors' experience on other projects.
- 18          7. Completion of several site visits, teleconferences and meetings with
- 19          utilities (nationally as well as internationally) to obtain first hand accounts
- 20          of successes and challenges. SDG&E visited or interviewed:
- 21           a. Pennsylvania Power & Light Co. (PPL)
- 22           b. Idaho Power
- 23           c. TXU Electric Delivery
- 24           d. Jacksonville Electric Authority (JEA)
- 25           e. Ontario Electricity Distributors Association (EDAM)
- 26           f. Utility AMI Organization
- 27           g. City of San Diego Water Department
- 28           h. Anaheim Municipal Utility
- 29           i. Pacific Gas & Electric (PG&E)
- 30           j. Southern California Edison (SCE)

1 8. The inclusion of a 15% deployment cost contingency that will help  
2 mitigate any unforeseen risks.

3 AMI risk assessment and management continues as SDG&E progresses  
4 toward full-scale implementation. SDG&E will evaluate other alternatives such  
5 as contractual risk transfer to the vendor/contractor in control of the scope of  
6 work and, where feasible and commercially available, commercial insurance, or  
7 other financial instruments (letter of credit, etc.). As appropriate, protective  
8 provisions will be incorporated in installer and product manufacturer contracts,  
9 such as “transfer of risk” under the Indemnity/Hold Harmless, Insurance,  
10 Limitation of Liability, Liquidated Damages, Warranty, and other related clauses.  
11 In summary, in considering the AMI scope of work, SDG&E has taken all  
12 identified logical and prudent risk management steps.

### 13 **B. Vendor Sourcing and Selection Process**

14 To ensure a systematic, structured, sound, and fair approach to selecting AMI  
15 vendors and solution sets, while also mitigating risk, SDG&E developed an open  
16 RFP process that is function and benefits-driven, and oriented towards producing  
17 a solution implementation roadmap. SDG&E secured the services of experienced  
18 consultants to take a comprehensive look at the marketplace without bias toward  
19 any specific vendor technology or product for an AMI solution.

20 SDG&E will choose the most cost-effective, least risky, long-term business  
21 solution that facilitates the broad adoption of AMI, diminishes technology and  
22 functional risks, and empowers consumers with tools to 1) improve their  
23 understanding of their personal energy use and, 2) meet or exceed the six policy  
24 goals / functional requirements noted above. The AMI solution SDG&E selects  
25 will be compatible with other utility applications and will improve service  
26 reliability and create operating efficiencies.

27 SDG&E meticulously pursued a benefits-driven approach to AMI to ensure  
28 fulfillment of the six policy goals, realization of demand response and operational  
29 benefits, while providing for the lowest total cost of ownership. SDG&E plans to  
30 enter into contract negotiations and field tests beginning Q2 2006. Once vendor

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1 selections are made and contracts are finalized, SDG&E intends to inform the  
2 Commission by filing the executed contracts via advice letter.

3 SDG&E's bid selection process fully supports the goals of General Order  
4 (GO) 156<sup>4</sup> and includes the rules and guidelines set forth in that order supporting  
5 both workforce and supplier diversity. Consistent with SDG&E's business  
6 practice, monitoring and reporting measures are in place to ensure that diversified  
7 business practices are performed and measured. In addition, safety is an integral  
8 part of SDG&E's core workplace values and is a primary consideration of the  
9 AMI project. All installment, operations and administration will follow strict  
10 safety guidelines and sound ergonomics principles. Safety standards are a crucial  
11 part of the RFP evaluation process.

12 SDG&E anticipates that contract negotiations will not have a material impact  
13 on the cost estimates included in this business application. If, however,  
14 negotiations result in materially different cost assumptions, SDG&E will file an  
15 advice letter to reflect the new assumptions. Mr. Charles discusses the vendor  
16 solution set and selection process in more detail in Chapter 9.

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17 **C. SDG&E Will Evaluate Multiple Technologies and is Committed to Open**  
18 **Architecture.**

19 SDG&E's commitment to selecting the most cost effective, next generation  
20 solution compels us to examine various communication technologies such as  
21 Broadband over Power Lines (BPL), WiMax, WiFi and other broadband  
22 technologies that have the potential to provide synergies with other utility  
23 applications. SDG&E's AMI vision allows for flexibility with regard to  
24 communications technologies and offers minimal overlap costs in this area should  
25 any broadband technology substantiate a more viable solution. Should a material  
26 or 'transformational' change in the AMI technology or product market occur from  
27 March 2006 through the deployment period, SDG&E may request a delay in this  
28 proceeding and/or in the AMI deployment activities. SDG&E's philosophy is to  
29 continue actively valuating and assessing new emerging AMI technologies even

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<sup>4</sup> GO 156: Rules Governing the Development of Programs to Increase Participation of Women, Minority and Disabled Veteran Business Enterprises in Procurement of Contract from Utilities as Required by Pub. Util. Code §§ 8282 – 8286.

1 as SDG&E completes field tests that resulted from the AMI request for proposal  
2 (RFP). Moreover, as part of prudent business practice, SDG&E will continue to  
3 review and assess new emerging AMI technologies, communications methods and  
4 in-home demand response enabling technologies. As a result of this market place  
5 monitoring, SDG&E may issue an addendum to the AMI RFPs issued in October  
6 2005, or a new RFP that will allow for the evaluation of new technologies. Any  
7 new AMI technologies or new market product offerings would need to provide  
8 SDG&E customers with additional value and functionality or reduced costs such  
9 that the net incremental benefits from the potential new technology or offering  
10 exceeds the cost to convert or change from the selected SDG&E AMI solution  
11 set(s).

12 Open architecture and communications standards allows SDG&E the ability  
13 to adopt multiple technologies with minimal incremental cost impact. SDG&E  
14 proactively supports open architecture through participation in groups such as  
15 UtilityAMI and OpenAMI. As Mr. Pruschki details in Chapter 11, SDG&E is  
16 considering various WAN and head-end systems technology that offer open  
17 architectures. Local Area Network (LAN) and AMI communications systems do  
18 not have readily available open architecture.

19 **D. The CPUC Should Not Consider Broadband Over Power Line in This**  
20 **Proceeding**

21 Issues related to BPL should not be considered by the CPUC in this  
22 proceeding. Consolidation of these issues here would cause unnecessary delay  
23 and largely waste the progress that has been made in the AMI proceeding over the  
24 past three years.

25 Since mid-2002, the Commission and numerous parties have invested  
26 significant time and thought in the R.02-06-001 rulemaking considering a host of  
27 AMI issues, minimum criteria and business case analytical methodology. That  
28 effort has revealed that AMI has it own benefits and can be accommodated  
29 through a number of communications systems, of which BPL may be one. The  
30 significant benefits of AMI should not be delayed by regulatory consideration of  
31 BPL as one of those alternatives.

32 **E. AMI Program Management**

1           SDG&E recognizes that the size and complexity of this proposed AMI project  
2 requires the services of a project management firm with demonstrated expertise in  
3 large projects to ensure a successful deployment. Through the RFP process,  
4 SDG&E entered the marketplace, seeking vendors interested in performing all  
5 AMI program management activities, all AMI field operational services, or both.  
6 The various options include multiple layers of service level and financial  
7 responsibilities. Mr. Charles discusses AMI project management and related  
8 costs in greater detail in Chapter 9.

9 **IV. SUMMARY OF OPERATIONAL COSTS**

10           The incremental operational costs of deploying an AMI system are found  
11 primarily in Chapters 9 - 12. This testimony represents the revised estimates of  
12 implementing an AMI system with results from the Request for Proposal (RFP)  
13 process. The operational costs included within this supplemental testimony will  
14 not be reflected in SDG&E's General Rate Case.

15 **A. Chapter 9, Testimony of Patrick Charles**

16           In Chapter 9, Mr. Charles describes SDG&E's human resource, facilities and  
17 project management costs for a contracted workforce. This includes the additional  
18 costs related to employee recruitment and office facilities necessary for  
19 incremental labor to implement and maintain an AMI system. Mr. Charles also  
20 describes SDG&E's plan to establish a project management office (PMO)  
21 operated by well-established vendors and SDG&E personnel. The PMO will  
22 focus on establishing a comprehensive project plan that maximizes the potential  
23 to complete the AMI project on time and within budget, while managing  
24 foreseeable project risks, and identifying unforeseen project risks.

25 **B. Chapter 10, Testimony of Dawn Welch**

26           In Chapter 10, Ms. Welch describes SDG&E's scalable and flexible AMI  
27 Information Technology (IT) systems. Scalability allows for application growth,  
28 the adoption of new technology without replacement, price sensitive rates and  
29 compatibility with load control devices affecting demand response. Ms. Welch  
30 also describes the introduction of new systems architecture promoting both  
31 flexibility and cost effectiveness of future systems changes. In addition, Ms.

1 Welch describes buying available systems versus building them, leveraging  
2 completed research and development experience from various vendors. Further,  
3 Ms. Welch discusses benefits derived from collecting and storing interval data,  
4 next day online presentment of electric consumption to customers and full  
5 integration of AMI into SDG&E's current information systems.

6 **C. Chapter 11, Testimony of Paul Pruschki**

7 In Chapter 11, Mr. Pruschki describes AMI communications systems capable  
8 of full two-way communications providing daily retrieval of fifteen minute and  
9 hourly usage data from electric meters and one-way communication providing  
10 daily usage data from gas meters. In addition, Mr. Pruschki describes how  
11 SDG&E's AMI communications system provides near real-time data for outage  
12 management, and daily data for theft detection, and forecasting. Mr. Pruschki  
13 also discusses a two way communications conduit into the home or office to  
14 facilitate the use of Programmable Controllable Thermostats (PCTs), an enabling  
15 technology which will help customers manage there energy usage and stimulate  
16 demand response. Further, Mr. Pruschki describes SDG&E's AMI  
17 communications enabled bi-directional electric meters capable of recording and  
18 storing consumption that will support programs like net metering and California's  
19 Solar Initiative

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20  
21 **D. Chapter 12, Testimony of Jose Carranza**

22 In Chapter 12, Mr. Carranza describes the process to replace and/or retrofit a  
23 projected 1.4 million electric meters and 900,000 natural gas meters in  
24 approximately two and one-half years. Additionally, Mr. Carranza describes  
25 SDG&E's requirement that installation vendors partner with the International  
26 Brotherhood of Electrical Workers (IBEW) Local Union 465. Further, Mr.  
27 Carranza discusses SDG&E's role in establishing a close working relationship  
28 with installation vendors to minimize service disruption to customers, ensure  
29 safety, and audit quality of workmanship.  
30  
31

1 **V. CONCLUSION**

2 SDG&E's AMI project is large and complex. SDG&E believes it has taken the  
3 necessary steps to effectively evaluate the potential AMI technology solutions and to  
4 quantify the operational benefits associated with deploying the system. This will ensure  
5 that expected operational and demand response benefits can be achieved in a cost  
6 effective manner.

7 SDG&E expects to implement an AMI solution is capable of exceeding the six  
8 functional requirements / policy goals referenced above, and can: 1) support a variety of  
9 dynamic pricing tariffs and operational efficiencies; 2) collect energy usage for electric  
10 customers on a 15-minute or hourly interval basis and natural gas customers on a daily  
11 basis; 3) provide online presentation to customers of their specific usage; 4) provide  
12 flexibility and scalability without significant additional hardware; 5) provide the  
13 capability of interfacing with all other SDG&E systems; and 6) offer operating costs and  
14 benefits that support achieving the expected demand response benefits.

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15 In summary, SDG&E's AMI project provides a viable solution to improve  
16 customer experience and education, and to provide the opportunity for seeking  
17 operational efficiencies in delivering reliable energy service.

18 This concludes my testimony.

1 **VI. QUALIFICATIONS OF TED M. REGULY**

2 My name is Ted Michael Reguly and I am employed by San Diego Gas and  
3 Electric Company (SDG&E). My business address is 8326 Century Park Court, San  
4 Diego, CA 92123.

5 My present position is Director of AMI Program Office in the AMI Program  
6 Office Department of SDG&E. My primary responsibility is to oversee the development  
7 and implementation of the AMI program. I have been employed by SDG&E since 1981.  
8 I have held various positions of increasing responsibility in Electric Generation, Electric  
9 and Gas Distribution, Supply Management, and Gas and Electric Customer Service  
10 supervision. In 2005, I assumed the position of Director of the AMI Program Office in  
11 the Customer Services Division of SDG&E. I am a registered California Mechanical  
12 Engineer. I received a B.S. in Mechanical Engineering from California State University,  
13 Long Beach, and an MBA from San Diego State University.

14 This concludes my prepared direct testimony. I have not previously testified  
15 before the California Public Utilities Commission.