BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Application of Pacific Gas and Electric Company for Authority to Increase Revenue Requirements to Recover the Costs to Deploy an Advanced Metering Infrastructure U 39 E	A.05-06-028 (Filed June 16, 2005)

TWELFTH SEMI-ANNUAL ASSESSMENT REPORT ON THE DEPLOYMENT OF PACIFIC GAS AND ELECTRIC COMPANY'S ADVANCED METERING INFRASTRUCTURE PROGRAM AND TWELFTH QUARTERLY REPORT ON THE IMPLEMENTATION PROGRESS OF THE SMARTMETER™ PROGRAM UPGRADE

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Dated: October 1, 2012

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Pacific Gas and Electric Company (PG&E) submits the attached Twelfth Semi-Annual Assessment Report on the deployment of its Advanced Metering Infrastructure (AMI) Program and the Twelfth Quarterly Report on the implementation progress of its SmartMeter™ Program Upgrade. PG&E combines both the semi-annual and quarterly reports from the AMI and SmartMeter™ proceedings into a single filing as a result of consultations with the Energy Division. These reports comply with the requirements of D.06-07-027, Ordering Paragraph (O.P.) 16, D.09-03-026, O.P. 7, and the May 4, 2010 Assigned Commissioner's Ruling in A.05-06-028.

Respectfully Submitted,

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By: */s/ Christopher J. Warner*
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Pacific Gas and Electric Company
Advanced Metering InfrastructureSemi-Annual Assessment Report
SmartMeter™ Program Quarterly Report
January 1 – June 30, 2012

(CPUC Decisions 06-07-027 and 09-03-026)

Date of Filing: October 1, 2012

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Pacific Gas and Electric Company
Advanced Metering Infrastructure Semi-Annual Assessment Report
SmartMeter™ Program Quarterly Report
January 1 – June 30, 2012

I. Executive Summary

This is Pacific Gas and Electric Company's (PG&E or the Company) twelfth semi-annual assessment report (Report) regarding the deployment of PG&E's Advanced Metering Infrastructure (AMI) Program (now the SmartMeter™[1] Program) and serves as the thirteenth quarterly report for the SmartMeter™ Program Upgrade.[2] This Report reflects the period from January 1, 2012 through June 30, 2012.

Consistent with the AMI Decision, this Report provides updates in the following areas: (1) advances in AMI technology; (2) a self-assessment of AMI system operating performance based on performance criteria that PG&E established with input from the Commission's Energy Division and the Division of Ratepayer Advocates (DRA); (3) an updated cost-effectiveness review; and (4) customers' interest in real-time usage data.[3]

A. Introduction

PG&E's SmartMeter™ Program is the largest installation of advanced meters in North America, with 9.4 million electric and gas SmartMeters™ installed as of June 30, 2012. Playing a foundational role in modernizing the electric grid, SmartMeters™ in California are a critical part of statewide policy to better manage energy, and to create

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[1] SmartMeter™ is a licensed trademark of SmartSynch, Inc.

[2] PG&E proposed its SmartMeter™ Program in Application (A.) 05-06-028, which the California Public Utilities Commission (CPUC or Commission) approved in Decision (D.) 06-07-027 (the AMI Decision). The AMI Decision requires that PG&E provide the Commission with a semi-annual report assessing the SmartMeter™ deployment. See Ordering Paragraph (O.P.) 16. PG&E issued an updated SmartMeter™-proposal (the SmartMeter Upgrade) in A. 05-06-028, which the Commission approved in D.09-03-026 (the Upgrade Decision). There, the Commission directed PG&E to provide quarterly reports on the Program. See O.P. 7. PG&E conferred with the Commission's Energy Division to establish the information to be provided and has prepared this Report to comply with the requirements of both the AMI Decision (O.P. 16) and the Upgrade Decision (O.P. 7).

[3] D.06-07-027 at pp. 57-58.

the smarter grid that the State needs to incorporate more renewable resources, deliver cleaner energy, and realize the State's ambitious energy efficiency goals.

More recently, PG&E has pioneered an "opt-out" alternative[4] for customers who do not wish to have SmartMeters™ – a previously-unanticipated practice that utilities across the country (e.g., Central Maine Power, Portland General Electric, NV Energy) have emulated; and PG&E also has launched the Green Button, a means for customers to download their energy-usage data in a standard format.

B. Update on the SmartMeter™ Program

PG&E's SmartMeter™ Program is nearing the completion of the objectives that the Commission outlined in the AMI and Upgrade Decisions. This section of the Report provides an overview of Program developments and PG&E's progress on individual elements of the Program during the first six months of 2012.

1. Progress in PG&E's AMI Deployment

As of June 30, 2012, PG&E had installed 9.4 million gas and electric SmartMeters™ (including retrofits[5]) – far and away the largest AMI-deployment in North America – and the associated network equipment and information technology (IT) necessary to operate PG&E's SmartMeter™ system. Specifically, as of June 30, 2012, approximately 9,398,000 meters (approximately 5,176,000 electric and 4,222,000 gas meters) have been converted to, or replaced with, SmartMeter™ technology, representing approximately 93 percent of the total PG&E meter population. Of this number, PG&E has "activated" approximately 5,660,000 meters and recorded $144.3 million of benefits to the gas and electric SmartMeter™ balancing accounts.

4 See A.11-03-014 and D.12-02-014. As of the time of this filing, roughly 31,400 customers have asked to opt-out of the SmartMeter™ Program.

5 PG&E installed 370,500 first-generation SmartMeters™ between March 2006 and December 2008.

PG&E continues to deploy solid-state electric meters communicating over a radio frequency (RF) mesh network, and gas modules communicating over an RF network. The deployment of the RF Mesh network was planned to consist of an initial phase to deploy Access Points (APs) at defined locations throughout PG&E's service territory, followed by subsequent phases to deploy additional APs to strengthen the network where required. As of December 31, 2011, PG&E had installed all of the 11,379 electric network devices (APs and Relays) and 4,817 gas network data collection units (DCUs) anticipated for the SmartMeter™ Program.[6]

Further details of the SmartMeter™ Program's deployment status are provided in Section II of the Report. Further details of the SmartMeter™ Program's cost and benefit status are detailed in Section III of this Report.

During the first half of 2012, PG&E continued its customer outreach activities to address the concerns that some customers have expressed about SmartMeter™ technology. These activities included increased customer contacts before, during, and after deployment. In addition, PG&E has continued to ensure the accuracy of its SmartMeters™ through meter-testing at the manufacturers' factories, random-sample testing at PG&E's Fremont-based meter shop, and field-testing at customer premises. It is PG&E's practice to field-test any SmartMeter™ upon customer request. In addition, PG&E launched its SmartMeter™ Opt-Out Program on February 1, 2012, as discussed in greater detail in Section II.A.

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[6] Note that although PG&E has deployed all of the network equipment that it anticipated, there may be unique, individual locations requiring modifications to optimize performance. In addition, customers' delay in accepting installation of SmartMeters™, as represented in the Extended Delay List, already has reduced connectivity (i.e., degraded the RF-network) in some cases; and opt-outs from the SmartMeter™ Program will degrade the RF-network and its performance, necessitating reinforcement. Neither opt-outs nor the activities reflected in the Extended Delay List originally were anticipated by PG&E or the Commission.

2. Program Costs and Benefits

In late 2010 and early 2011, the SmartMeter™ Program Management Office (PMO) performed a detailed review of all workstream forecasts. The Program sought and received approval in February 2011 from PG&E's Board of Directors to exceed the cost-cap that the CPUC authorized and to spend up to $2,335 million to complete the Program, with $39 million to be borne by Company shareholders. As reported in its financial disclosures, PG&E recorded an earnings reserve of $36 million, representing the current forecast of capital-related costs by which the Company expects to exceed the CPUC-authorized cost cap. PG&E will continue to update its forecasts as the Program continues and may incur additional costs.

As of June 30, 2012, PG&E had allocated the entire $2,335 million Board-authorized program amount to Program workstreams, and the PMO continues to monitor actual spending against the Board-approved forecast, as well as monitor issues and risks that could contribute to potential cost overruns. SmartMeter™ Program expenditures through June 30, 2012 totaled approximately $2,253 million.

3. System Performance Criteria

System performance metrics are provided in Table IV-2.

4. Customer Interest in Accessing Real-Time Usage and Pricing Information

PG&E launched its SmartRate™ Program in May 2008. As of September 25, 2012, the SmartRate™ Program had 79,418 active and pending residential customers. Details of the SmartRate™ Program are provided in Section V of this Report.

5. SmartMeter™ Information Technology Progress

During the last half of 2011, PG&E substantially completed the implementation of the complex IT systems and interfaces necessary to support the SmartMeter™ Program, as discussed in Section VI of this Report.

6. Advances in AMI Technology

PG&E continues to monitor metering and network collector technologies as the AMI-industry advances. PG&E also continues to participate in industry activities related to advanced metering and communication networks, as well as monitor announcements and activities that are significant in the industry, as reported in Section VII of this Report. These activities allow PG&E to stay actively involved in and aware of industry developments.

II. Progress in PG&E's AMI Deployment

A. Overview

In 2011, PG&E substantially completed its deployment of necessary network-infrastructure and its development of necessary IT to support the SmartMeter™ Program. In the first six months of 2012, PG&E continued to deploy SmartMeter™-endpoints, installing approximately 80,637 gas and 73,188 electric SmartMeters™, as well as upgrade 60 first-generation electric meters.

Subject to various outstanding issues, including customers' elections to opt-out of the SmartMeter™ Program, the Program's 2012-13 activities will focus on substantially completing the remaining meter deployment. The deployment schedule is dependent upon the availability of trained resources, an effective supply chain, and access to customer premises to make the necessary changes at each service location, variations in which could affect the scheduling of meter endpoint installations. These undertakings are further complicated by the competing urgency to remove the SmartMeters™ of customers who opt-out of the SmartMeter™ Program, which PG&E has prioritized since the SmartMeter™ Opt-Out Program's inception.

PG&E launched its SmartMeter™ Opt-Out Program on February 1, 2012, immediately following the CPUC's issuance of Decision 12-02-014. The SmartMeter™ Opt-Out Program provides residential customers with the option to choose electromechanical meters instead of SmartMeters™. The Commission has established interim charges for customers electing to opt-out of the SmartMeter™ Program, specifically an initial charge of $75 and an ongoing monthly charge of $10 (the CPUC set the opt-out charges for CARE/FERA customers at $10 upfront and $5 monthly).

The CPUC's decision also ordered a second phase of the proceeding to consider (1) a community-based opt-out alternative and (2) cost recovery, including setting final customer charges. At the Administrative Law Judge's request, PG&E filed legal briefing on community opt-out on July 16, 2012 (opening brief) and July 30, 2012 (reply brief); and PG&E filed testimony regarding its cost-recovery on August 10, 2012. The CPUC has stated that it expects to issue its Phase 2 decision on community-based opt-out in January 2013 and on cost recovery issues in May 2013.

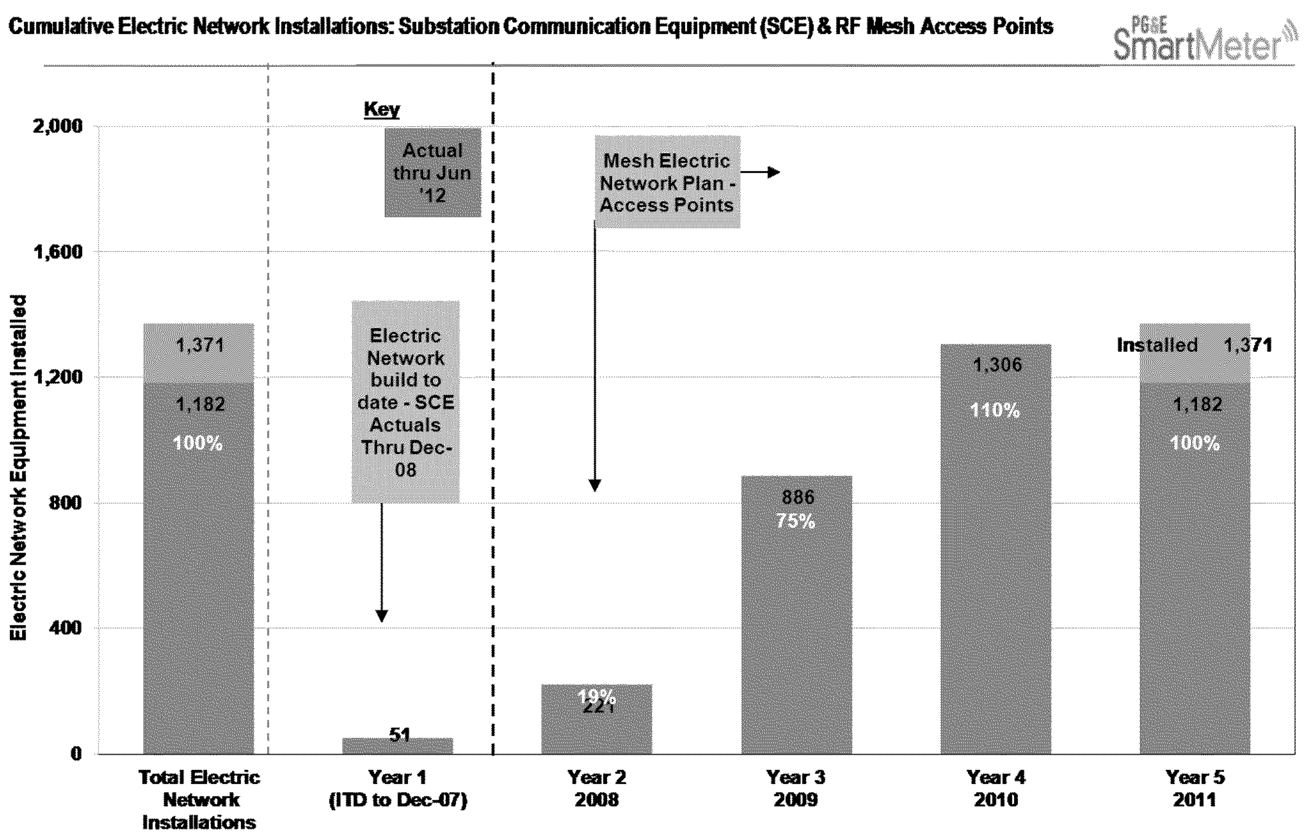
B. Infrastructure Installations

As of June 30, 2012, PG&E had installed approximately 9.4 million meters (including retrofits) with SmartMeter™ technology. PG&E has deployed approximately 364,000 retrofit endpoints to replace the Company's first-generation meters, which relied on PowerLine Carrier (PLC) technology. Tables II-1 through II-4 summarize the progress of PG&E's SmartMeter™ Program implementation through June 30, 2012.

Table II – 1

Cumulative Meters (In Thousands)	2007	2008	2009	2010	2011	2012 (Thru June)
Electric Meters Installed	136	376	2,306	4,067	5,095	5,176
Gas Meters Installed	142	1,294	2,310	3,645	4,149	4,222
Total	278	1,670	4,616	7,712	9,244	9,398
Electric Meters Activated	54	183	1,150	2,000	2,504	2,876
Gas Meters Activated	24	601	1,538	2,192	2,539	2,784
Total	78	784	2,688	4,192	5,043	5,660

Table II – 2



Electric Network - Substation SCE	Total	Yr 1 (to Dec-07)				
Cumulative Installed thru 06/12	51	51				
Plan	51	51				
Electric Network - RF Mesh Access Points	**Total**	**Yr 1 (to Dec-07)**	**2008**	**2009**	**2010**	**2011**
Cumulative Installed thru 06/12	1,371	-	221	886	1,306	1,371
Plan	1,182	-	221	886	1,306	1,182

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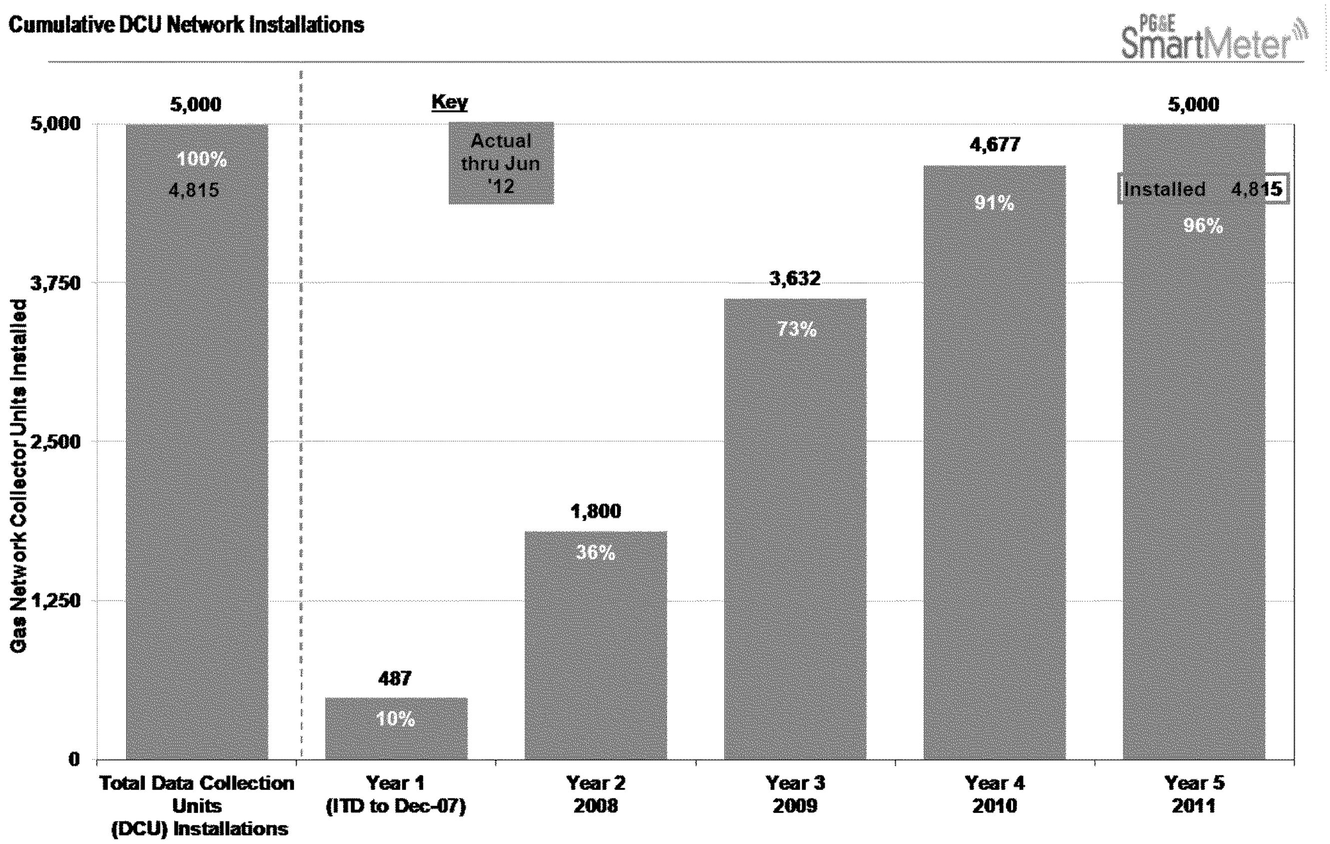
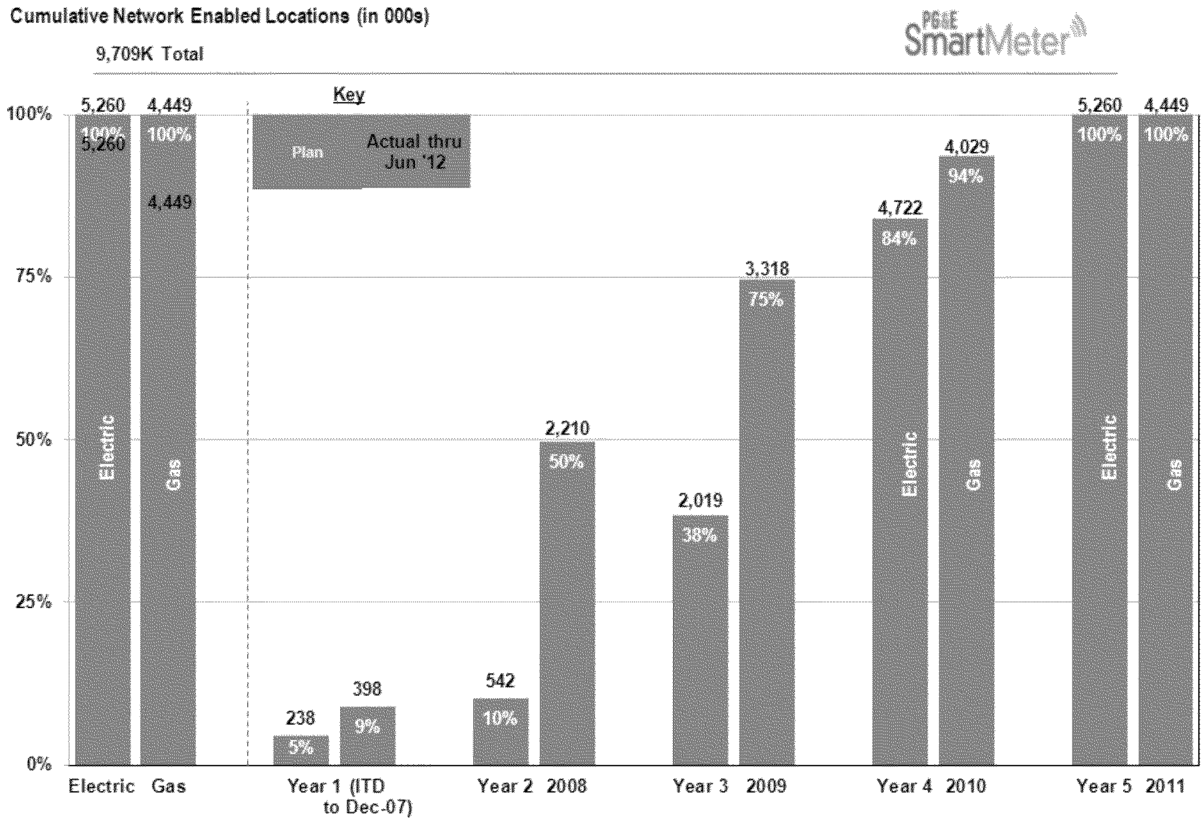
Table II – 3



Cumulative Data Collection Unit (DCU) Installations	Total	Yr 1 (to Dec-07)	2008	2009	2010	2011
Installed thru 06/12	4,815	487	1,800	3,632	4,677	4,815
Plan	5,000	487	1,800	3,632	4,553	5,000

Table II - 4



Cumulative Network Enabled Locations	Total	2007		2008		2009		2010		2011	
(000)		Electric	Gas	Electric	Gas	Electric	Gas	Electric	Gas	Electric	Gas
Enabled thru 06/12	9,709K	238K	398K	542K	2,210K	2,019K	3,318K	4,424K	4,162K	5,260K	4,449K
Plan*	9,709K	238K	398K	542K	2,210K	2,019K	3,318K	4,722K	4,029K	5,260K	4,449K

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III. Program Costs and Benefits

A. <u>SmartMeter™ Program Costs</u>

The SmartMeter™ PMO maintains governance over the allocation of both the Program's annual budget and the budget-to-completion for each of the Program's respective workstreams. For purposes of this Report, the workstreams are summarized into four major categories: Field Delivery, Information Technology, Customer & SM (SmartMeter™) Operations, and PMO/Business Operations.

The Program budget includes a risk-based allowance directed by the officer-led Steering Committee, which the CPUC authorized to address unanticipated costs necessary to complete the defined Program work scope. In addition, the PMO recommends reallocations, both increases and decreases, within and among workstream budgets, as circumstances require.

As shown in Table III-1, through June 30, 2012, the SmartMeter™ Program incurred costs of approximately $2,253 million ($1,833 million in capital and $420 million in expense). Of this total dollar amount, Field Delivery activities have cost approximately $1,483 million (66 percent) and IT-related activities have cost approximately $509 million (22 percent). The remaining 12 percent is attributed to the (a) Customer & SM Operations and (b) PMO/Business Operations categories.

<u>Table III – 1</u>

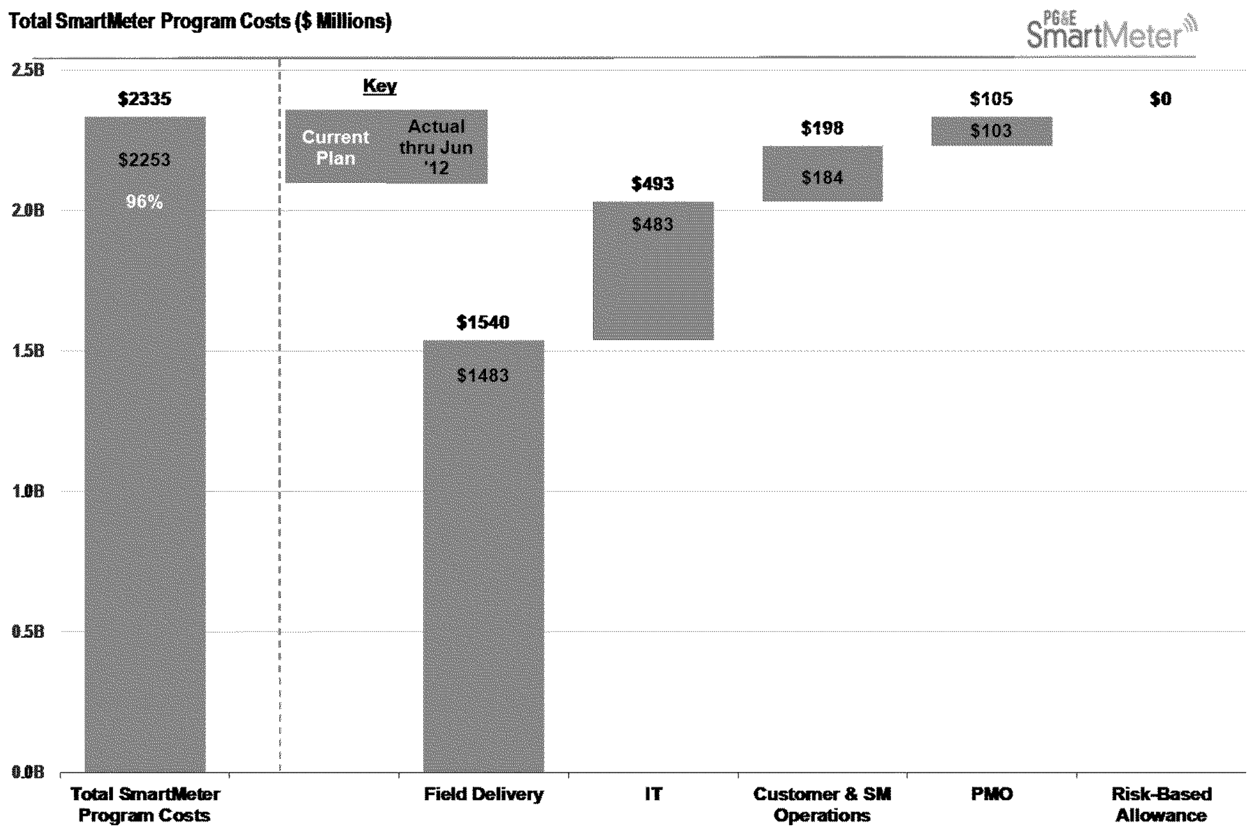
($ Millions)	TOTAL	Field Delivery & Solutions	Information Technology & Business Process	Customer & SM Operations	PMO & Technology Monitoring	Risk-Based Allowance
Plan as of December 31, 2011	2,335	1,537	493	200	106	
Cost Adjustments	-	3	-	(2)	(1)	
Plan as of June 30, 2012	2,335	1,540	493	198	105	
Risk-Based Allowance Drawdown to Date	178					178
Future Potential Use	-					-
Total Risk-Based Allowance	(178)					-
Additional Board-approved Cost	129					
Actuals Thru June 30, 2012	2,253	1,483	483	184	103	
% of Plan	96%	96%	98%	92%	95%	

The Customer & SM Operations category includes $54.8 million specifically authorized in the AMI Decision for the purpose of marketing Critical Peak Pricing programs. As of June 30, 2012, PG&E utilized approximately $40.2 million of this $54.8 million in support of SmartRate™ marketing.

(Thousands of Dollars)	2006 Actual	2007 Actual	2008 Actual	2009 Actual	2010 Actual	2011 Actual	2012 Actuals	Total
SmartRate™ Marketing & Education and Customer Web Presentment	349	1,166	6,811	6,828	2,500	19,385	3,207	40,245

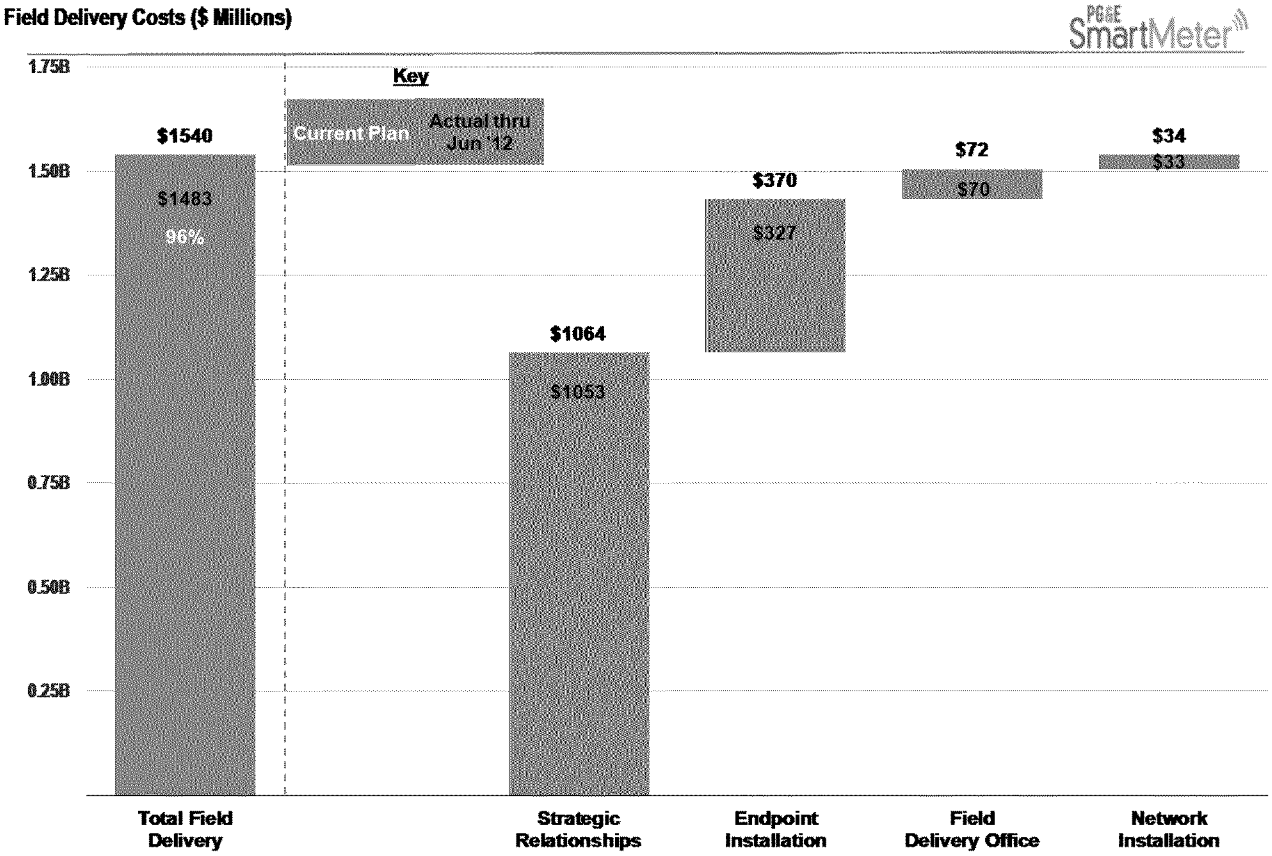
Tables III-2 through III-7 show PG&E's incurred costs from inception through June 30, 2012, for the SmartMeter™ Program, as well as each respective budget category. The percent-of-expenditures refers to the total incurred expenditure through June 30, 2012 as a percentage of the adjusted workstream budgets at Program completion.

Table III-2



$ Millions	Total SmartMeter Program Costs	Field Delivery	IT	Customer & SM Operations	PMO	Risk-Based Allowance
Actual thru June 30, 2012	$ 2,253	1,483	483	184	103	N/A
Plan as of December 31, 2011	$ 2,335	1,537	493	200	106	-
Cost Changes/Reallocation	$ -	3	-	(2)	(1)	-
Plan as of June 30, 2012	$ 2,335	1,540	493	198	105	-
% of Plan completed	96%	96%	98%	93%	98%	-

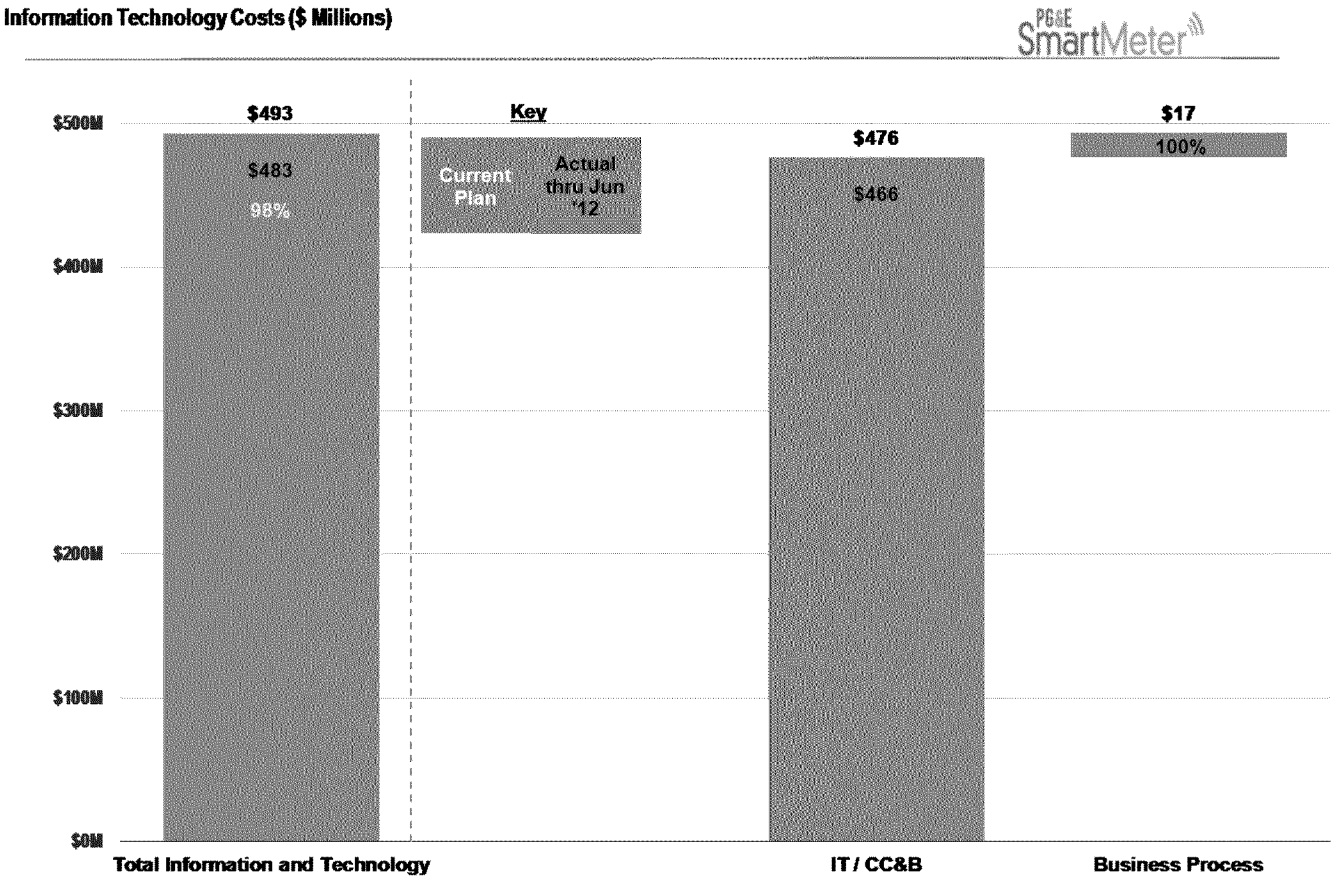
Table III-3



$ Millions	Total Field Delivery	Strategic Relationships	Endpoint Installation	Field Delivery Office	Network Installation
Actuals thru June 30. 2012	1,483	1,053	327	70	33
Plan as of December 31, 2011	1,537	1,064	370	68	35
Cost Changes/Reallocation	3	-	-	4	(1)
Plan as of June 30, 2012	1,540	1,064	370	72	34
% of Plan Expended	96%	99%	88%	97%	97%

$ Millions	Network Installation	Electric Network	Gas Network
Actuals thru June 30, 2012	$ 33	21	12
Plan as of December 31, 2011	$ 35	24	12
Cost Changes/Reallocation	$ (1)	(1)	-
Plan as of June 30, 2012	$ 34	23	12
% of Plan Expended	97%	91%	99%

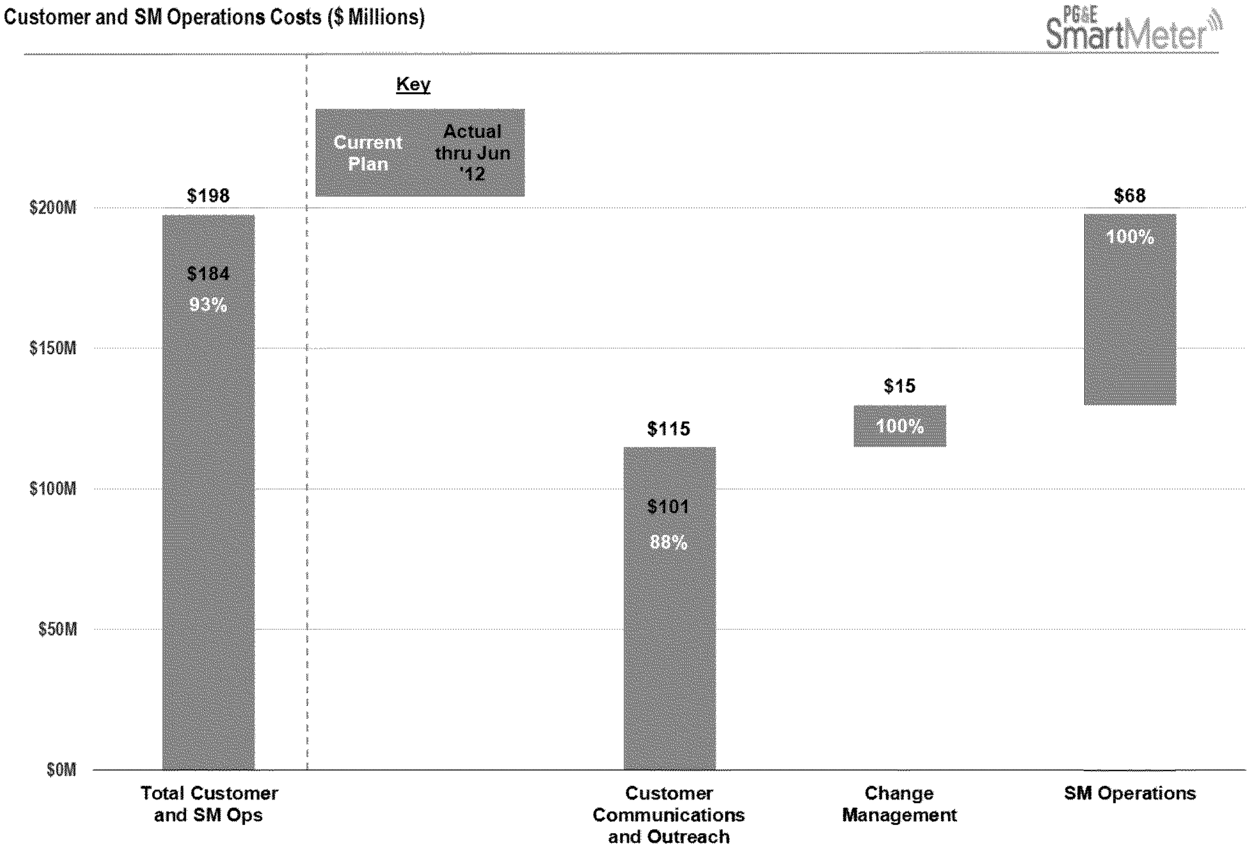
Table III-4



$ Millions	Total Information and Technology		IT / CC&B	Business Process
Actuals thru June 30, 2012	$	483	466	17
Plan as of December 31, 2011	$	493	476	17
Cost Changes/Reallocation	$	-	-	-
Plan as of June 30, 2012	$	493	476	17
% of Plan Expended	98%		98%	100%

Note: Totals subject to rounding

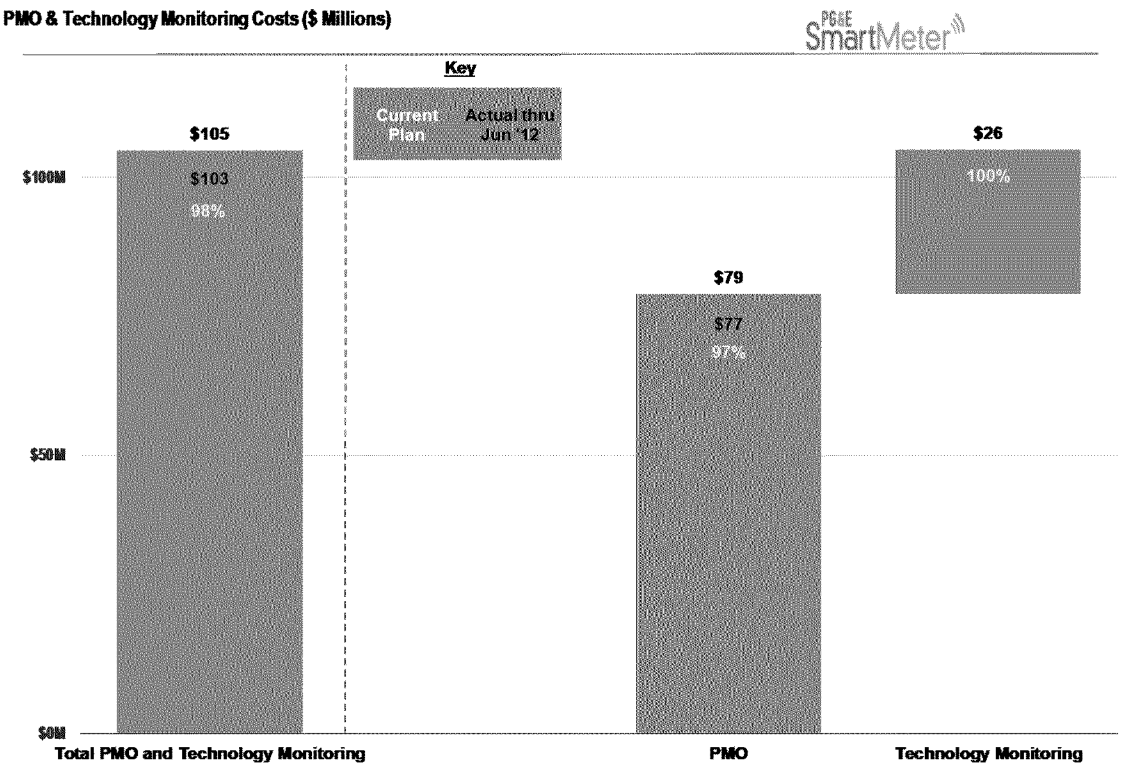
Table III-5



$ Millions	Total Customer and SM Ops	Customer Communications and Outreach	Change Management	SM Operations
Actuals thru June 30, 2012	$ 184	101	15	68
Plan as of December 31, 2011	$ 200	112	18	70
Cost Changes/Reallocation	$ (2)	3	(3)	(2)
Plan as of June 30, 2012	$ 198	115	15	68
% of Plan Expended	93%	88%	100%	100%

Note: Totals subject to rounding

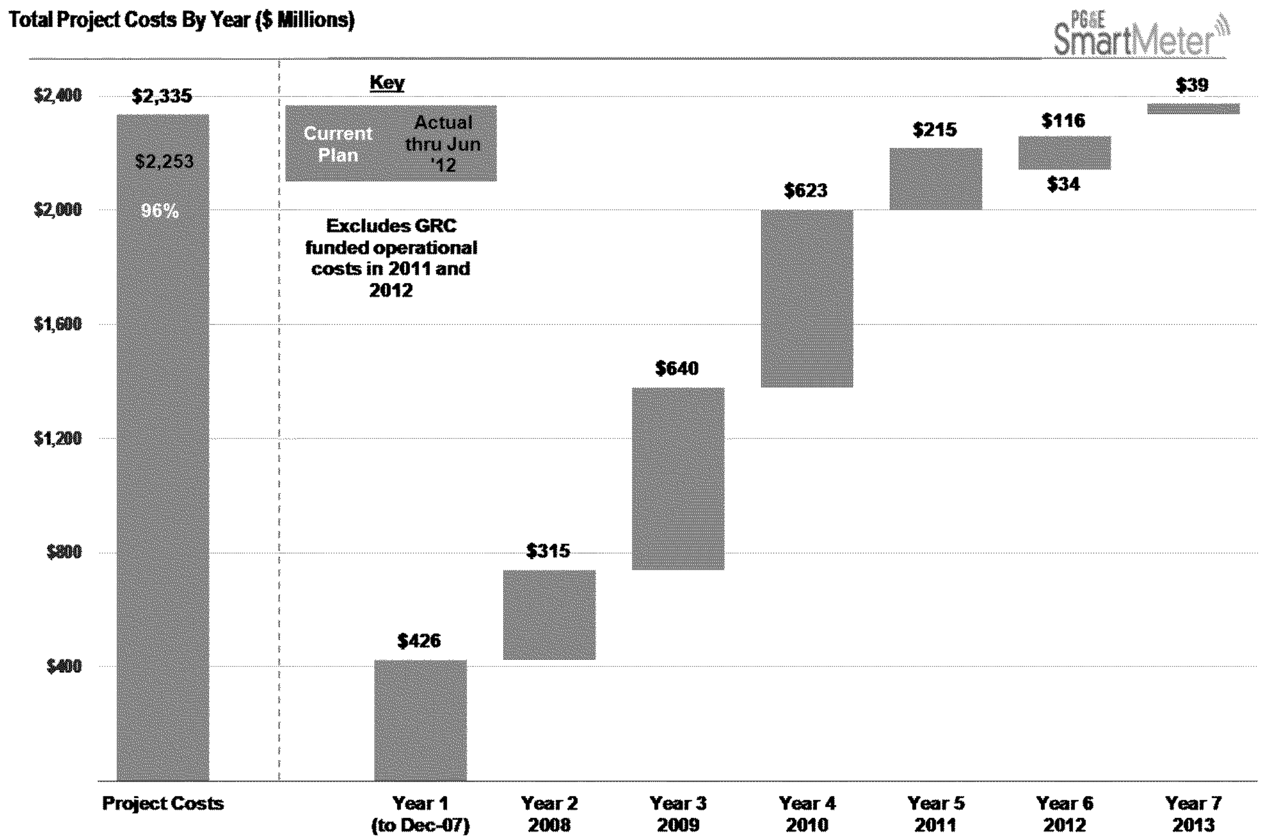
Table III-6



$ Millions	Total PMO and Technology Monitoring	PMO	Technology Monitoring
Actuals thru June 30, 2012	$ 103	77	26
Plan as of December 31, 2011	$ 106	80	26
Cost Changes/Reallocation	$ (1)	(1)	-
Plan as of June 30, 2012	$ 105	79	26
% of Plan Expended	98%	97%	100%

Note: Totals subject to rounding

Table III-7



$ Millions	Project Costs	Year 1 (to Dec-07)	Year 2 (CY 2008)	Year 3 (CY 2009)	Year 4 (CY 2010)	Year 5 (CY 2011)	Year 6 (CY 2012)	Year 7 (CY 2013)
Actuals thru June 30, 2012	$ 2,253	426	315	640	623	215	34	-
Plan as of June 30, 2012	$ 2,335	426	315	640	623	215	117	39
% of Plan Expended	96%	100%	100%	100%	100%	100%	29%	0%

Note: Totals subject to rounding

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B. Operational Benefits Realization

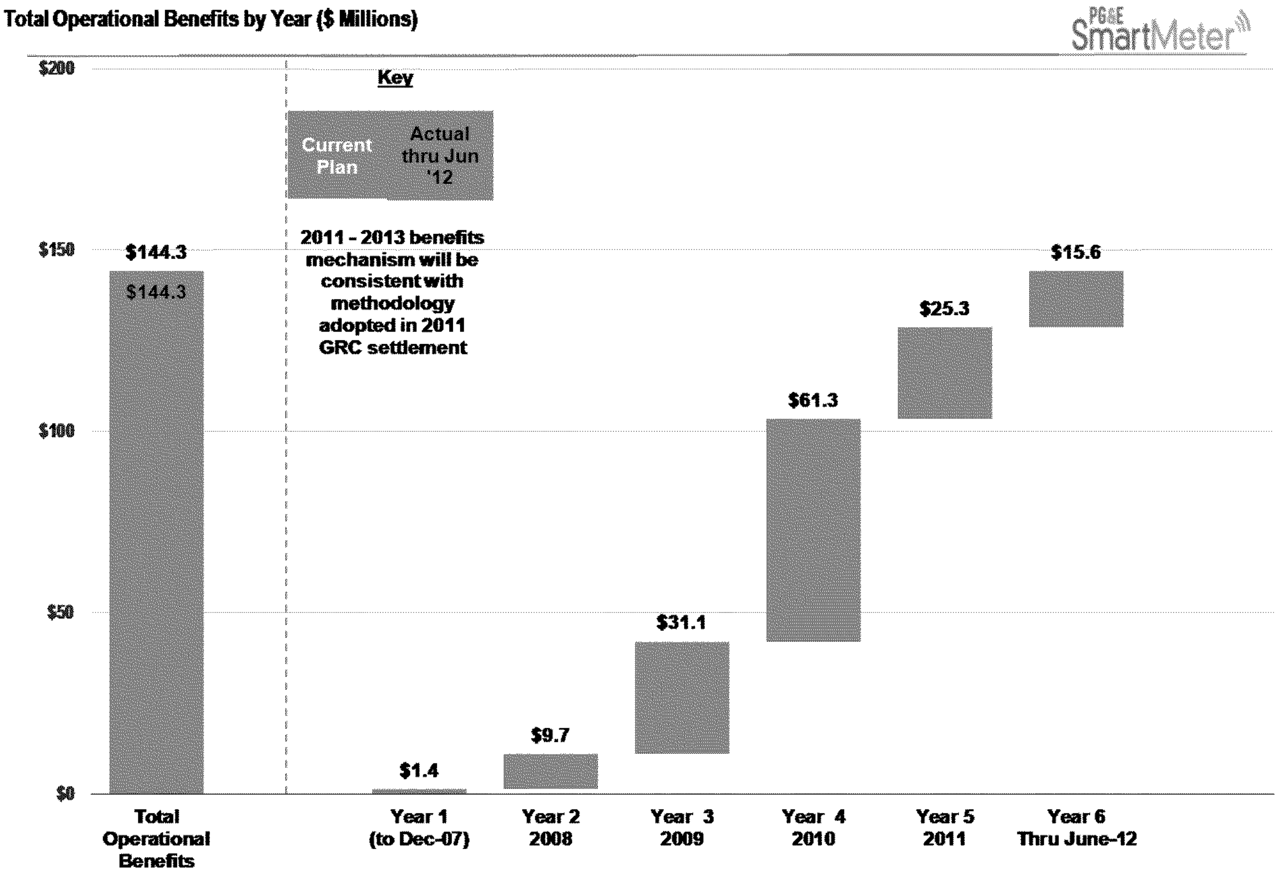
The Program realizes operational benefits when meters fitted with SmartMeter™ technology are activated, which occurs following installation of the meters and transition to SmartMeter™-based wireless billing.

PG&E transitions gas and electric meters to wireless reads and billing when: (1) the meters are installed and capable of wireless reads and billing; (2) the communications network infrastructure is in place to remotely read the meters; and (3) the remote meter reads become stable and reliable for billing purposes. Once enough customers on a particular "route string" transition to SmartMeter™ billing, manual reading of the meters on that "route string" ceases, at which point those meters are considered "activated."

PG&E's first meter activations occurred in December 2007. Through June 30, 2012, approximately 8,898,000 meters have been transitioned, and approximately 5,660,000 meters have been activated, with $144.3 million corresponding cumulative benefits recorded as credits to the balancing accounts. Such amounts are consistent with the calculation methodologies and savings rates adopted in the AMI and Upgrade Decisions, as adjusted by the 2011 General Rate Case (GRC) Decision 11-05-018.

Table III-8 shows activated meters and the corresponding benefits based on the savings rates adopted in the AMI and Upgrade Decisions. These benefits totaled $1.9543 per meter per month for electric and $1.0366 per meter per month for gas. Commission-approval of the 2011 GRC Settlement set activated meter benefits at $0.9225 per meter per month for electric and $0.0189 per meter per month for gas. In compliance with the 2011 GRC Settlement, the activated meter benefits were adjusted effective January 1, 2011, the largest adjustment of which was the removal of meter-reading savings that are now reflected in a new Meter Reading Cost Balancing Account.

Table III – 8



Activated Meter Benefit - Current Forecast (As of June 30, 2012)

(in thousands)		Year 1* (To Dec-07)	Year 2* (CY 2008)	Year 3* (CY 2009)	Year 4 (CY 2010)	Year 5 (CY 2011)	Year 6 (Thru June-12)
Meters							
Activated Electric meter months		50	1,436	6,669	17,495	26,812	16,623
Activated Gas meter months		21	2,086	12,666	21,341	28,314	16,299
Total Activated meter months		71	3,521	19,335	38,836	55,127	32,922
SmartMeter Balancing Account							
Electric at $1.77 per meter month	$1.77	$89	$2,544				
Electric at $1.95 per meter month	$1.95			$12,925	$34,191	-	-
Gas at $1.04 per meter month	$1.04	$22	$2,162	$13,129	$22,122	-	-
Electric at $0.92 per meter month		-	-	-	-	$24,734	$15,334
Gas at $0.02 per meter month		-	-	-	-	$535	$308
Reduced Software Licensing		$1,251	$5,000	$5,000	$5,000	-	-
Automate Interval Billing		-	-	-	-	-	-
		$1,362	$9,706	$31,054	$61,313	$25,269	$15,642

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IV. System Performance Criteria Metrics

System performance criteria and metrics are measured and reported on an ongoing basis. As stated in previous reports, PG&E may modify these criteria and metrics in order to better characterize system performance.

In Table IV-1, PG&E has summarized SmartMeter™ Program Data metrics for timely and estimated bills for the first and second quarters of 2012.

Table IV – 1

Timely Bills		
Month	**Overall**	**SmartMeter**
January 12	99.86%	99.92%
February 12	99.90%	99.95%
March 12	99.92%	99.97%
April 12	99.92%	99.97%
May 12	99.91%	99.97%
June 12	99.90%	99.97%
Total % of Service Agreements (SAs) Billed ≤ 35 Days as compared to all active SA's.		

Estimated Bills		
Month	**Overall**	**SmartMeter**
January 12	0.33%	0.05%
February 12	0.32%	0.05%
March 12	0.33%	0.05%
April 12	0.33%	0.06%
May 12	0.24%	0.07%
June 12	0.26%	0.07%
Number of bill segment calculations based on estimated usage as a % of all completed bill segments.		

The performance criteria presented in Table IV-2 are based on the number of actual reads retrieved by the head-end system versus the expected number of reads provided by the head-end system. Deployment in areas with poor communications coverage degrades performance, while firmware upgrades and supplemental network designs for existing and new installations improve performance. PG&E considers that the system performs as designed within the specified system requirements. Additionally, PG&E's monitoring of SmartMeter™ billing continues to indicate performance that meets and/or exceeds established criteria.

Table IV – 2

Performance Criteria	Jan'12 thru Jun'12	Jul'11 thru Dec'11	Jan'11 thru Jun'11	Jul'10 thru Dec'10	Jan'10 thru Jun'10	Jun'09 thru Dec'09
1. Electric module failure rate	0.25%	0.27%	0.42%	0.45%	0.09%	0.34%
2. Gas module failure rate	0.02%	0.11%	0.27%	0.09%	0.14%	0.36%
3. Electric network failure rate	0.57%	0.19%	0.52%	0.35%	0.23%	0.63%
4. Gas network failure rate	0.45%	0.95%	0.65%	0.13%	0.14%	0.34%
5. Electric billing data collection failure rate	0.11%	0.15%	0.23%	0.27%	0.39%	1.14%
6. Gas billing data collection failure rate	0.86%	0.36%	0.29%	0.23%	0.16%	0.22%

The definitions of the system performance criteria presented in Table IV-2 are as follows:

Electric module failure rate: This rate represents the incidence of meters removed specifically for suspected meter hardware failures (such as blank displays, meter/module hardware errors, and non-communicating meters). This rate does not count external causes (e.g., broken covers, customer-damaged meters, or tampering/theft). Meters removed for suspected meter hardware failures are investigated through the Return Material Authorization (RMA) process.

Gas module failure rate: This rate represents the incidence of modules removed specifically for suspected hardware failures (such as bad battery/poor charging patterns, bad module circuits, and non-communicating modules). This rate does not count external causes (e.g., customer-damaged meters, scheduled meter changes, or dog-caused damage). Modules removed for suspected hardware failures are investigated through the RMA process.

Electric network failure rate: This rate represents the incidence of network components removed and submitted for RMA (such as APs and relays failing to communicate or failing to maintain charging capacity). This rate also includes component failure in substation communication equipment.

Gas network failure rate: This rate represents the incidence of gas network components removed and submitted for RMA (such as components failing to maintain charging capacity, drifting off frequency, experiencing cellular failures, and experiencing failed electronic boxes).

Electric billing data collection failure rate: This rate represents the number of electric SmartMeters™ from which complete data (complete backhaul data, daily anchor, and complete set of intervals) were not retrieved, divided by the total number of electric SmartMeters™. This measure consists of the percentage of complete daily data sets, one good anchor read and complete good interval reads, averaged over the defined period. Any service point with an estimated anchor and/or estimated interval read(s) fails this measure and is excluded. Failure of this read metric does not lead to an estimated bill; an accurate bill can be generated in most cases.

Gas billing data collection failure rate: This rate represents the number of gas SmartMeters™ from which a daily cumulative read was not retrieved, divided by the total number of gas SmartMeter™ devices. Failure of this read metric does not lead to an estimated bill; an accurate bill can be generated in most cases.

V. Customer Interest in Accessing Real-Time Usage and Pricing Information

PG&E launched its residential critical peak pricing program, SmartRate™, in May 2008. This program encourages customers to manage energy usage during particularly hot summer days, when SmartDay™ events are triggered. PG&E's more aggressive acquisition efforts in 2012 have resulted in over 50,000 new customer enrollments in 2012. As of September 25, 2012, PG&E has a total of 79,418 active and pending SmartRate™ participants.

Decision 10-02-032, which adopted Peak Day Pricing (PDP), ordered 172 SmartRate™ small to medium businesses to transition to PDP as of May 1, 2010. The decision also ordered residential customers on SmartRate™ to default to PDP as of February 1, 2011. PG&E requested, and the CPUC granted, an extension to November 1, 2011 for this transition. In Decision 11-11-008, the CPUC deferred this transition.

In 2010, PG&E made changes to its SmartRate™ marketing strategy to account for the program ending in 2010 and the CPUC's decision to default all SmartRate™ customers to PDP in February 2011. Given the differences between SmartRate™ and PDP, as well as uncertainty in the ultimate characteristics of the pending PDP program, PG&E adjusted the focus of its SmartRate™ outreach to maintain its then-existing population of program participants. SmartRate™ customers received both a welcome-back letter and retention mailer. The welcome-back letter reminded customers about the start of the season and provided information to allow customers to update their notification sources. The retention mailer included customer-centric tips for event days. PG&E also communicated with customers when notifications were unsuccessful to obtain updates to notification contact information.

In June 2012, PG&E published its Final 2011 Ex Post and Ex Ante Load Impact Evaluation report for the Residential SmartRate™, Time-Of-Use rates schedules and SmartAC™ Program, which provides details on the 2011 season performance of the SmartRate™ population. This evaluation is conducted using the industry's best practices and methods and is compliant with California's Demand Response Protocols (CPUC Decision 08-04-050). The statewide Demand Response Measurement and

Evaluation Committee vets this report, which PG&E disseminates to the service list for CPUC Rulemaking 07-01-041. The findings include:

- There were 15 SmartDays™ during the 2011 season (conducted from May 1 through October 31).
- On average, participants reduced peak electricity use by 13 percent across the 15 event days.
- June's two event days offered the season's highest average reduction of about 15 percent.
- In general, participants with central air conditioning reduced peak electricity use more (approximately 23 percent) than those without it.
- 86 percent of SmartRate™ respondents report being very satisfied with SmartRate™.
- A higher portion of low-income customers indicated high levels of satisfaction compared to non-low-income respondents (90 percent versus 83 percent).
- 83 percent of respondents perceived they were saving energy during their SmartRate™ participation and 82 percent of those thought they experienced a lower bill.
- 90 percent of respondents plan to continue on SmartRate™.
- 88 percent of respondents would recommend SmartRate™ to a friend, and 60 percent have done so.

Although PG&E focused on retaining existing SmartRate™ customers in 2010-11, it also attempted to recruit new customers in connection with the deployment of SmartMeters™ to improve demand response and customer satisfaction. This new campaign solicited tips from participants concerning how to reduce peak demand (and associated electric bills) by offering a chance to win a prize with their submission. PG&E communicated these tips to customers through SmartDay™ event notifications to timely encourage customers to respond to the price signals.

In November 2011, the CPUC granted PG&E's request to retain SmartRate™ as a residential tariff option until the Commission finalizes its long-term residential-rate strategy. In 2012, given the greater certainty that the SmartRate™ program would continue, PG&E broadened its customer acquisition efforts, setting an aggressive goal of 77,000 total customer enrollments by the end of 2012.

During 2012, PG&E's SmartRate™ marketing plan leveraged the following lessons learned from prior SmartRate™ marketing efforts:

- Targeted direct mail was selected as the primary marketing tactic due to its proven effectiveness in driving program enrollment.
- Messaging used in the 2012 campaign utilized insights from customer responses in 2009 and prior research on messaging to determine which approaches resulted in the highest levels of customer responses.
- Cross-marketing was conducted with PG&E's SmartAC customers because previous marketing efforts to these customers in 2009 had resulted in among the highest levels of SmartRate™ enrollments

PG&E also expanded the reach of the campaign to include more eligible customers. The larger audience of eligible residential customers was segmented and targeted based on customer data including: higher levels of energy usage, geographic targeting to warm climate zones, propensity to respond, and other factors. Additionally, the 2012 campaign included follow-up email marketing to customers that requested additional information about SmartRate™ as a result of the 2011 lead generation efforts.

To support currently enrolled customers, the SmartRate™ customer strategy provides ongoing communications to maximize their benefits from the program. These customers receive a series of communications to inform and engage them on ways to succeed on SmartDays. The intent of these efforts is to maintain the historically low level of less than two percent attrition.

As noted above, the combined marketing efforts to both acquire and retain customers in 2012 have resulted in a total of 79,418 active and pending SmartRate™ customers to date, surpassing PG&E's goal of 77,000 total customer enrollments by the end of 2012.

VI. SmartMeter™ Information Technology Progress

The SmartMeter™ Program established the SmartMeter™ Technology Completion Project (SMTCP) in the spring of 2011 to consolidate its remaining individual SmartMeter™ IT projects, including performance enhancement efforts, into a single effort. Centralized project management of the remaining IT efforts resulted in a focused, streamlined and financially-efficient solution delivery. The SMTCP Project was successfully completed and all functionality was transitioned to Operational Support in December 2011. The SmartMeter™ IT work is now substantially complete.[7]

VII. Advances in AMI Technology

A. Distribution Automation Update

On June 30, 2011, in compliance with Senate Bill 17, PG&E submitted its Smart Grid Deployment Plan (Application 11-06-029) to the CPUC, sharing PG&E's vision for the Smart Grid and a broad plan for modernizing its electric grid infrastructure to deliver a

[7] Two IT projects (related to Home Area Network and the Peak Time Rebate program) are deferred, along with their budgeted dollars, until the CPUC finalizes the scope and timeline for the programs. The CPUC issued a Resolution on the HAN Program on September 27, 2012, as discussed in Section VII.B.

host of energy and cost savings to customers. The plan included proposals by which PG&E's AMI communications network would support Distribution Automation applications, including line sensor applications.

On November 21, 2011, PG&E filed its Smart Grid Pilot Deployment Project, Application 11-11-017, seeking approval for six pilot projects that will test, evaluate, and pilot selected technologies and initiatives, which when fully deployed could provide significant customer benefits, modernize PG&E's electric grid, and support the Smart Grid policy goals outlined in Senate Bill 17. A CPUC decision on PG&E's application is pending.

In Decision 12-04-025, the Commission adopted metrics to measure the Smart Grid deployments of PG&E, Southern California Edison Company, and San Diego Gas and Electric Company. PG&E will report these metrics in its Smart Grid Deployment Plan Annual Report, to be submitted to the Commission on October 1, 2012. As the SmartMeter™ program draws to a close, PG&E expects that the Commission will monitor PG&E's participation in and reporting on Distribution Automation activities in the Smart Grid proceeding.

B. <u>HAN Update</u>

The CPUC continues to encourage development of Home Area Network (HAN) functionality. In Decision 11-07-056, the Commission ordered PG&E, Southern California Edison Company, and San Diego Gas and Electric Company to file HAN "rollout" implementation plans by the end of November 2011, including an initial-phase rollout of up to 5,000 HAN devices starting March 1, 2012. PG&E's HAN Implementation Plan, filed on November 28, 2011, describes the capabilities and schedule for PG&E's HAN-enabled programs, including discussion of how standards-development and market-adoption will affect the plan.

In March 2012, PG&E began its Initial Rollout Phase, with in-home display devices to 500 residential customers. PG&E is currently planning and designing for its Early Adopter Phase, whereby customers will be able to buy and self-register a HAN device with PG&E to obtain near real time energy usage data from their SmartMeter™.

On September 27, 2012, the Commission issued Resolution E-4527, addressing the utilities' HAN Implementation Plans. Among other things, Resolution E-4527 requires PG&E to revise its HAN Implementation Plan to incorporate the new requirements provided in the Resolution. These new requirements include:

- Accepting customers' HAN activation requests beginning on January 15, 2013;
- Supporting an infrastructure that can accommodate the following number of HAN activation requests:
    - 5,000 before June 30, 2013
    - 25,000 before December 31, 2013
    - 200,000 before December 31, 2014
- Developing with the other investor-owned utilities 1) a common set of reasonable requirements and testing process for validating interoperability between the utilities' electric smart meters and commercially-available HAN devices offered by third parties and 2) a common set of reasonable requirements to be satisfied by a HAN device supplier for its device to be eligible for interoperability validation testing by the utility.

C. Technology Industry Updates

PG&E continues to lead and participate in industry activities related to advanced metering and communication networks, including through memberships in professional organizations and attendance at conventions and trade shows. In the first quarter of 2012, PG&E representatives delivered presentations at the Distributech conference (January 2012).

PG&E actively participates in the following significant groups as part of the Company's commitment to an open and interoperable Smart Grid:

- Utility Communications Architecture (UCA)[8] Open Smart Grid Technical Committee – Providing oversight over UCA's systems, communications, security, simulations, and certification and testing working groups. The UCA Open Smart Grid committee (a utility leadership committee) has been integral in setting utility requirements in UCA and providing them to the appropriate standards bodies.
- UCA Open Auto DR (Chair) – Transforming the Lawrence Berkeley National Laboratory Automated Demand Response requirements from a specification to a standard.
- Smart Energy Profile 2.0 (SEP 2.0) Application Specification – Creating an open standards-based communication technology to enable two-way communication between devices and energy service providers. A PG&E representative is the chair of the Security sub-group for this application protocol specification.
- OpenSG "Green Button" Task Force (Proposed) – Creating an OpenADE/ESPI based common format to allow users to download their data and share it with third-party application developers.

[8] The UCA® International Users Group is a nonprofit corporation consisting of utility user and supplier companies dedicated to promoting the integration and interoperability of electric/gas/water utility systems through the use of international standards-based technology.

- SAE J2847/1 – Setting the communication standards between vehicle and grid for purposes of energy transfer and defining its mapping to the SEP 2.0 HAN application standard.
- OpenADR Alliance (A PG&E representative is the treasurer and board member of this nonprofit corporation) – Fostering the development, adoption, and compliance of a Smart Grid standard known as Open Automated Demand Response (OpenADR).
- The National Institute of Standards and Technology (NIST) SmartGrid Testing and Certification Committee (SGTCC) – Creating and maintaining the necessary documentation and organizational framework for compliance, interoperability and cyber-security testing and certification for SGIP-recommended Smart Grid standards.
- NIST SGIP[9] – Defining requirements for essential communication protocols and other common specifications and coordinating development of these standards by collaborating organizations in a public/private partnership.

PG&E continues to believe that making these standards interoperable through a comprehensive certification process should be one of the industries' highest priorities. PG&E will continue to work with major industry stakeholders and the above organizations in assisting with that challenge.

[9] The NIST initiated the SGIP to support NIST in fulfilling its responsibility, under the Energy Independence and Security Act of 2007, to coordinate standards development for the Smart Grid.