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Case Study of Smart Meter System Deployment

Recommendations for Ensuring Ratepayer Benefits

APPENDICES

March 2012

About DRA

The Division of Ratepayer Advocates (DRA) is an independent consumer advocacy division within the California Public Utilities Commission (CPUC) that represents the customers of California's investor-owned utilities. DRA's statutory mission is to obtain the lowest possible rates for utility service consistent with safe and reliable service levels.

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APPENDICES

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Table of Contents

APPENDIX 1: Glossary 1

APPENDIX 2: Overview of AMI in California 5

APPENDIX 3: Cost Recovery 12

APPENDIX 4: DRA Methodology 15

APPENDIX 5: List of Business Case Costs and Benefits 20

APPENDIX 1: Glossary

AMI	Advanced Metering Infrastructure. AMI is also commonly referred to as " smart meters," although AMI encompasses meters and other equipment, software, and processes necessary to make the meters fully functional. SCE's SmartConnect is a specific example of an AMI system.
Capital Expenditure	An expenditure that is treated as an accounting asset and depreciated over time. They also are placed in rate base, and customers pay a rate of return on these expenditures. Capital expenditures include all long-term assets, which are expected to be "used and useful" over an extended period of time; for instance IT hardware and software physical plant, and related equipment, etc. In other words, a capital expenditure is a capital investment (i.e., part of rate base), upon which the utility is allowed to earn a profit (commonly referred to as rate of return). The capital investment shows on the utility's balance sheet.
CEC	California Energy Commission
CPP	Critical Peak Pricing. A time-varying rate in which customers are notified, typically on a day-ahead basis, that their rates will increase during a specified "event" (usually four to six hours during the late afternoon). CPP events are typically called in anticipation of abnormally high demand or other system constraints.
CPUC	California Public Utilities Commission
CSBU	Customer Services Business Unit. The organization at SCE which includes meter reading, field service, and billing, which is most affected by the SmartConnect program.

Demand Response (DR)	Gives individual electric customers the ability to reduce or adjust their electricity usage in a given time period, or shift that usage to another time period, in response to a price signal, a financial incentive, or an emergency signal. Programs designed to reduce energy demand during peak usage periods, which drives procurement of new capacity. This includes time-varying rates/tariffs, programs designed to generate load control and price-responsive demand response, and in certain cases energy conservation. Generally used in reference to DR programs adopted by the CPUC.
Deployment Costs/Benefits	Costs/benefits which have been approved by regulators and for which a cost-recovery mechanism has been established. For SmartConnect, this originally referred to costs/benefits incurred during the time period beginning September 18, 2008 through December 31, 2012[1]. It also describes the costs/benefits required to be provided by the functionality, features, and programs proposed in SCE's application (adopted in D.08-09-039).
DRA	Division of Ratepayer Advocates
DR-specific Costs/Benefits	As opposed to operational costs/benefits (see below), DR-specific costs are those that are not necessary for AMI deployment, *except* to implement and administer DR programs. DR benefits are benefits that could only occur as a result of these programs.
ERRA	Energy Resources Recovery Account
ESCBA	Edison SmartConnect Balancing Account. Also referred to as the SmartConnectBA by SCE.
GRC	General Rate Case
HAN	Home Area Network

[1] SCE has proposed modifying the pervious definition of SmartConnect deployment costs to extend beyond December 31, 2012. See SCE testimony in the TY 2012 GRC, Exhibit SCE-4, volume 1, page 30.

IHD	In-Home Display
IOU	Investor owned utility
Incremental AMI-enabled Costs/Benefits	Requests for new AMI enabled programs, operational costs, or capital investments which promise benefits beyond those quantified in the original business case. "Incremental" refers to those costs and benefits that were either excluded or underestimated in the original business case for various reasons (e.g., unforeseen costs).
Meter Month	A term used to amortize deployment period benefits into rates. For each new meter, it is the number of months the meter has been in service, as counted starting 8 months after the meter was purchased. For example, 10 meters installed May 1, 2009 would generate 120 meter months as of December 31, 2010.
Operational Costs/Benefits	In terms of the AMI business cases, operational costs are all the costs necessary to implement and administer AMI deployment. Operational benefits are all the benefits resulting from such costs. In R.02-06-001, the CPUC directed the electric IOUs to analyze AMI deployment scenarios that included operational costs/benefits only, and scenarios that included both operational and DR-specific costs/benefits.
Operations & Maintenance (O&M) Expense	An accounting expense that shows on the utility's income statement (i.e., annual profit and loss statement). O&M expenses are not included in rate base. O&M expenses include, for example, purchased power and fuel; customer accounts, services, and marketing expenses; and administrative and general expenses.
PCT	Programmable Communicating Thermostat

Post-Deployment Costs/Benefits	Costs/benefits, other than deployment costs, in the adopted cost-benefit analysis and which have corresponding benefits in the AMI business case. For SCE, those costs/benefits incurred during the time period beginning January 1, 2013.[2]
PTR	Peak Time Rebate. Demand Response (DR) program in which customers are notified, typically on a day-ahead basis, that they may receive rebates for reducing their electricity usage during a specified "event" (usually four to six hours during the late afternoon). PTR events are typically called in anticipation of abnormally high demand or other system constraints.
PVRR	Present Value Revenue Requirement
RSS	Remote Service Switch (connect/disconnect). A feature of SmartConnect meters installed on services less than 200 amps which allows the utility to end, and restart electrical service remotely, without sending a service technician.
SCE	Southern California SCE
SmartConnect	Southern California SCE's brand name for their AMI system.
SPP	Statewide Pricing Pilot
TOU	Time-of-Use. A time-varying rate in which prices vary depending on the season and time of day. TOU prices are typically higher during "peak" and "semi-peak" hours, when demand is expected to be higher, as opposed to " off-peak" hours. In contrast to CPP, TOU does not include significantly higher prices that can be applied to rates on a day-ahead basis.

[2] Ibid.

APPENDIX 2: Overview of AMI in California

AMI is intended to provide benefits to customers and service providers by automating meter reading, optimizing utility resources, and providing utility customers with information about their energy use. AMI is a metering and information technology (IT) system that typically consists of:

- Advanced electronic meters that collect interval usage data, often referred to as smart meters;
- A home area network (HAN) that shares price and usage data between the smart meter and digital devices in the house;
- A system of communication networks allowing data transfer and communication between the meter and the utility;
- Other energy management devices, making use of commonly available fixed communications networks; and
- Data capture and management systems that make the smart meter information available to a wide range of users within the utility.

In California, AMI has its origins in the electricity crisis of 2000-2001, which was a period of highly volatile wholesale electricity prices and rolling outages resulting from deregulation of the wholesale energy market. Following the electricity crisis, the California Legislature passed a number of bills[3] and approved emergency funding to implement programs aimed to save

[3] Three urgency bills targeting energy use and peak demand were enacted during calendar years 2000 and 2001: Assembly Bill 970 (Statutes of 2000), Senate Bill 5X (Statutes of 2001), and Assembly Bill 29X (Statutes of 2001).

energy and reduce peak electric demand.[4] One of the bills passed was Assembly Bill (AB) 29x, which provided $35 million from the State General Fund to the California Energy Commission (CEC) to equip all large customers (those with peak electric demand levels of 200 kW or greater) with interval meters. Additionally, the CPUC and CEC developed the state's Energy Action Plan,[5] which guided policies and programs to maintain electric system reliability (i.e., "keeping the lights on"), control utility costs, and reduce greenhouse gas (GHG) emissions. AMI was one of those programs.

In June 2002, the CPUC instituted Rulemaking (R.) 02-06-001 to "enhance electric system reliability, reduce power purchase and individual consumer costs, and protect the environment."[6] Working with other state agencies, the CPUC placed a high priority on the development of demand responsiveness capability in the California electricity market.[7] Declaring the meter as the starting place for developing demand response capability for any customer, the CPUC initially focused on metering hardware and software by developing a plan for AMI deployment.[8]

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[4] CEC Report to the Legislature, *Feasibility of Implementing Dynamic Pricing in California* (October 2003), mimeo at 1. *See* http://uc-ciee.org/downloads/dyn_prcng_rprt.pdf, accessed April 6, 2011.

[5] Energy Action Plan I (adopted May 8, 2003); Energy Action Plan II (adopted September 21, 2005). See http://www.energy.ca.gov/energy_action_plan/2003-05-08_ACTION_PLAN.PDF and http://www.energy.ca.gov/energy_action_plan/2005-09-21_EAP2_FINAL.PDF , accessed June 15, 2011.

[6] "Order Instituting Rulemaking on policies and practices for advanced metering, demand response, and dynamic pricing", R.02-06-001, June 6, 2002, p. 1

[7] "Interim Opinion in Phase 1 Adopting Pilot Program for Residential and Small Commercial Customers," D.03-03-036, in R.02-06-001, March 13, 2003, pp. 3 (mimeo). Demand Response "gives an individual electric customer the ability to reduce or adjust their electricity usage in a given time period, or shift that usage to another time period, in response to a price signal, a financial incentive, or an emergency signal." *See* "Interim Opinion in Phase 1 Addressing Demand Response Goals and Adopting Tariffs and Programs for Large Customers," D.03-06-032 in R.02-06-001, June 5, 2003, Attachment A p. 1, (mimeo).

[8] R.02-06-001, p. 5 (mimeo).

The CPUC adopted two decisions in early 2003 and determined that the proceeding would continue with a second phase. The first decision established a Statewide Pricing Pilot (SPP) program for small commercial and residential customers, designed to measure customers' response to different types of time-varying rate tariffs in conjunction with AMI.[9] The second decision adopted Demand Response (DR) programs and voluntary time-varying rate tariffs for large customers, utilizing previously installed interval meters funded by AB 29X.[10] That decision also adopted a vision statement that determined all customers should have an advanced metering system capable of supporting time-varying rate tariffs, if cost-effective.[11]

The CPUC initiated Phase 2 in September 2003 with a key focus of developing an analysis framework for the IOUs to use in developing AMI business cases. The framework would include a determination of appropriate categories of costs and benefits.[12] Two rulings were issued in 2004. One provided policy direction regarding the minimum level of AMI system functionality[13] and the other contained requirements for analysis to be included in utility AMI applications.[14]

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[9] D.03-03-036.

[10] D.03-06-032.

[11] D.03-06-032, Attachment A pp. 2-3 (mimeo). The vision statement was attached to the decision and intended to be a living document.

[12] "Assigned Commissioner and Administrative Law Judge's Ruling Setting Forth Scope of Phase 2," R.02-06-001, September 19, 2003, pp. 1-2 and 4 (mimeo).

[13] "Joint Assigned Commissioner and Administrative Law Judge's Ruling Providing Guidance for the Advanced Metering Infrastructure Business Case Analysis," in R.02-06-001, February 19, 2004, pp. 2-6 (mimeo).

[14] "Administrative Law Judge and Assigned Commissioner's Ruling Adopting a Business Case Analysis Framework for Advanced Metering Infrastructure," R.02-06-001, July 21, 2004, Appendix A (mimeo) ("July 2004 Ruling").

The utilities also were ordered to file preliminary AMI deployment analyses followed by applications containing AMI deployment strategies.[15] Thus, the CPUC explicitly required the IOUs to proceed with developing AMI deployment proposal, and California's three large electric IOUs filed applications for deployment of AMI beginning in 2005.

SCE's initial business case analyses for AMI showed that AMI was not a cost-effective endeavor at that point in time. Specifically, only two of SCE's scenario analyses showed a positive present value revenue requirement (PVRR),[16] and those two scenarios were largely dependent on the added demand response from large customers (maximum demand >200 kW) that already had interval meters. In its revised business case, SCE stated that "the technology envisioned by the Ruling is unproven and not commercially available at this time."[17]

In order to move forward with a cost-effective plan for AMI while also meeting CPUC deadlines, SCE filed an application in March 2005 for *pre-deployment* funding to develop an AMI product that would provide greater functionality and thereby deliver further benefits, which SCE argued were necessary to make its AMI business case cost-effective. SCE proposed a project with three phases, the second and third phases only if it succeeded in making AMI cost-effective during the first. In A.05-03-026 ("Phase 1 Pre-deployment"), SCE sought

[15] July 2004 Ruling, pp. 2 and 4 (mimeo). *See* Attachment A and Appendix A.

[16] PVRR is a single calculated value that sums the time-discounted cost/benefit cash flows of SmartConnect (in terms of revenue requirements) for each year of the program.

[17] "Southern California Edison Company's (U 338-E) Revised Preliminary Analysis of Advanced Metering Infrastructure Business Case," in R.02-06-001, January 12, 2005, p. 17 (mimeo).

authorization to spend up to $31 million in pre-deployment costs.[18] In December 2005, the CPUC approved $12 million through an all-party settlement for SCE's Phase 1 pre-deployment application.[19]

SCE filed its Phase 2 application in December 2006, seeking authorization to spend up to $67 million in 2007 for AMI pre-deployment, focusing on testing whether AMI equipment available on the market would meet SCE's technical and business requirements. The results of these tests were to be used for validating costs and benefits of the full deployment business case.[20] The CPUC approved Phase 2 pre-deployment funding in the amount of $45.22 million.[21]

SCE filed its Phase 3 application in July 2007 (referred to in this Case Study as the SmartConnect Application), seeking authorization to spend $1.634 billion to deploy a specific AMI system it called SmartConnect. Including a forecasted $1.2 billion in post-deployment costs, SCE initially estimated that this investment would result in $109 million net benefits (PVRR). This estimate was increased to $116 million net benefits (PVRR) through a set of errata testimony and workpapers, even though the estimated benefits did not change and the total (nominal) costs increased by nearly $200 million. This result was achieved by shifting upfront costs to later years: cost *reductions* in the deployment period had a greater impact on

[18] "Southern California Edison Company's (U 338-E) Application for Approval of Advanced Metering Infrastructure Deployment Strategy and Cost Recovery Mechanism," A.05-03-026, p. 1 (mimeo). Since the Advanced Integrated Meter (AIM) Project was SCE's original Advanced Metering Infrastructure (AMI), the term "AMI project" can be used.

[19] "Decision Adopting Settlement for Funding of Southern California Edison Company's Advanced Integrated Meter Project," D.05-12-001, in A.05-03-026 Dec. 1, 2005, pp. 1-2 and 6 (mimeo).

[20] "Southern California Edison Company's [U 338-E] Application for Approval of Advanced Metering Infrastructure Pre-Deployment Activities and Cost Recovery Mechanism," A.06-12-26, pp. 1 and 3 (mimeo).

[21] "Decision Approving Pre-Deployment Funding for Southern California Edison Company's Advanced Metering Infrastructure Project," D.07-07-042, in A.06-12-026, July 26, 2007, p. 1 (mimeo).

cost effectiveness, in present value terms, than even larger cost *increases* in the post-deployment period.

DRA and The Utilities Reform Network (TURN) actively participated in the proceeding. DRA's analysis at the time showed that SCE's business case would result in a negative net benefit (i.e., net cost) of approximately $216 million.[22]

SCE's business case continued to evolve through several iterations, and SCE and DRA eventually reached a settlement agreement, which they petitioned the CPUC to adopt.[23] In late 2008, the CPUC adopted the SCE – DRA Settlement Agreement in D.08-09-039 ("SmartConnect Decision"), by which the parties estimated a final net benefit of $9.2 million (PVRR). In the SmartConnect decision, the CPUC authorized SCE to spend up to $1.634 billion in AMI deployment costs over a deployment period extending through 2012.

Thus, while the deployment cost reflected in the settlement stayed nearly the same as what SCE initially requested, the cumulative effect of the multiple revisions was to increase post-deployment costs (most notably for back office/IT systems and Demand Response [DR] programs) and to decrease benefits (specifically, energy conservation and DR benefits) for every year except the first year of deployment (2008) and the final five years of the estimated project life (2028-2032).

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[22] "Testimony of Southern California Edison Company's Advanced Metering Infrastructure (AMI) Deployment Application (Public Version)," A.07-07-026, January 25, 2008, p. 1-1 (mimeo).

[23] In addition to its motion for adoption of the Settlement Agreement, SCE filed jointly with TURN a motion for adoption of stipulations, which are contained within the Settlement Agreement.

The SmartConnect Decision explicitly authorized only a deployment period budget of $1.63 billion for SCE's SmartConnect program. However, in basing the decision on a finding that the program was cost-effective, it implicitly adopted forecasted post-deployment costs of $1.58 billion and lifetime benefits of $7.4 billion (nominal).[24] As shown in Table 1 below, containment of deployment period (i.e., 2008-2012) costs is a necessary, but not sufficient, requirement for ensuring customers actually receive net benefits from SmartConnect deployment:

Table 1: Costs and Benefits of SmartConnect Program

($millions, nominal)

	Deployment	Post-Deployment	Total
Benefits	$437.6	$6,999.7	$7,437.3
Costs	$1,633.5	$1,582.1	$3,215.6
Net Benefits	-$1,195.9	$5,417.6	$4,221.7

Note: The $9.2 million net benefit (PVRR) discussed above reflects the time value of money, while the $4,221.7 million in Table 1 does not.

[24] D.08-09-039, Findings of Fact (FoF) 2, 4, 6, 9, and 10.

APPENDIX 3: Cost Recovery

Utility expenditures for programs, equipment, plant, and expenses are authorized in CPUC decisions, but authorization does not directly result in rates increasing or decreasing. Additional mechanisms are required to ensure the utility collects these authorized costs through customer bills. Fundamental ratemaking mechanisms include General Rate Cases (GRCs), Balancing Accounts, advice letter compliance filings, and tariff books.

Balancing Accounts are used extensively by the CPUC and utilities to account for program costs and to provide a record of compliance with approved budgets. Typically, program expenditures are entered as debits in the balancing account, and program funding that has previously been approved is entered as a credit. The balance can be checked at any time, and if the account has a net debit, the program is over-budget.

A Balancing Account is merely a mechanism by which utilities record costs that they intend to recover in rates. In and of itself, a Balancing Account does *not* ensure that a) the balance conforms to the adopted budget; or b) the expenditures were correctly booked to the account.[25]

Cost recovery for AMI costs in 2008 through 2012 can be simplistically summarized as follows:[26]

[25] Unless the accounts are audited, which does happen on a selective basis.

[26] Recovery of AMI pre-deployment costs of $12 million are not addressed here.

- SmartConnect costs, and some benefits, are tallied in the Edison SmartConnect Balancing Account (ESCBA);
- The forecasted SmartConnect deployment revenue requirement is added to customer rates *before* expenses are incurred; and
- Rates are subsequently adjusted for any differences between forecasted and actual revenue requirements.

In actuality this is a complicated process that involves multiple interrelated balancing accounts and a detailed understanding of the multifaceted Energy Resources Recovery Account (ERRA) proceedings.

Every August, SCE files an ERRA "forecast" application to request authority to recover costs for the next year. In April of the following year, SCE files its ERRA compliance, or "review" application, through which the CPUC reviews the prior year's recorded costs and may determine specific disallowances, in which case SCE must reflect the disallowed amount as a rate reduction. However, SCE combines approximately 15 separate balancing accounts – including the ESCBA – into complex ERRA applications. SCE is the only one of the three electric IOUs that recovers its non-ERRA costs in this manner.[27]

Going forward, the process described above will be modified. Beginning in August 2011, SCE's SmartConnect costs will not be recovered through the ERRA proceedings. DRA requested that SCE implement its consolidated revenue requirement via an advice letter filing,

[27] PG&E and SDG&E file separate annual advice letters to "true-up" any difference between their authorized revenue requirements and actual collections for their various balancing accounts.

instead of through its ERRA Forecast application. This treatment allows greater scrutiny of SmartConnect costs since they are not eclipsed by the larger fuel and power procurement costs. Pursuant to a CPUC decision, SCE will no longer implement its consolidated revenue requirement in future ERRA Forecast applications.[28]

In SCE's 2012 GRC application (A.10-11-015), SCE requests authority to keep ESCBA open, with certain limitations, through 2014.[29]

[28] "Decision Approving a Consolidated Revenue Requirement Increase of $403.8 Million, But a Rate Level Increase of $183.4 Million," D.11.04-006, in A.10-08-001, April 14, 2011, p. 10 (mimeo). Finding of Fact 9. *Also see* discussion at p. 7.

[29] "2012 General Rate Case – Customer Service Volume 1 – Policy," A.10-11-015, November 23, 2010, p. 30 (mimeo).

APPENDIX 4: DRA Methodology

DRA performed an extensive review of documents from CPUC proceedings and reports from the California Energy Commission (CEC) to develop the background sections of this report. The cost-effectiveness review included four major analytical steps:

1. Review and summarize pertinent sections of the AMI business case developed in SCE's Application (A.) 07-07-026 ("SmartConnect Application");[30]
2. Analyze SCE's recorded AMI costs and benefits and pending cost recovery requests;
3. Compare steps 1 and 2 above; and
4. Investigate and explain the cause of and deviations found in step 3 above.

Some parties may argue that SCE is not bound to producing the benefits forecasted in its adopted SmartConnect business case. But the fact is that a showing of cost-effectiveness was required for adoption of the SmartConnect program.[31] Even though SCE may not be required

[30] SCE's "AMI business case" for SmartConnect is a detailed analysis of whether the proposed program will provide net benefits on a present-value basis. *See* A.05-03-026 (Southern California Edison Company's (U 338-E) Application for Approval of Advanced Metering Infrastructure Deployment Strategy and Cost Recovery Mechanism), (March 30, 2005); A.06-12-026 (Southern California Edison Company's (U 338-E) Application for Approval of Advanced Metering Infrastructure Pre-Deployment Activities and Cost Recovery Mechanism), (December 21, 2006); and A.07-07-026 (Southern California Edison Company's (U 338-E) Application for Approval of Advanced Metering Infrastructure Deployment Activities and Cost Recovery Mechanism), (July 31, 2007). *Also see* http://www.sce.com/CustomerService/smartconnect/industry-resource-center/regulatory-filings.htm, accessed Jun. 28, 2011.

[31] "Decision Approving Settlement on Southern California Edison Company Advanced Metering Infrastructure Deployment," D. 08-09-039, in A. 07-07-026, September 22, 2008, pp. 55-56 (mimeo), Findings of Fact 2 and 6. Finding of Fact (FoF) 2: "In order to approve this application, we must find that the proposed AMI system affirmatively answers the following questions: c. Is SCE's AMI proposal cost-effective, and will it provide lasting value for SCE's customers?" FoF 6: "The proposal for AMI deployment contained in the Settlement Agreement is cost effective." The CPUC, through R.02-06-001, required that proposals for AMI deployment be cost-effective. See Joint Assigned Commissioner and Administrative Law Judge's Ruling Providing Guidance for the Advanced Infrastructure Business Case Analysis (Feb, 19, 2004).

to realize each of the benefits to the level forecasted, the business case provides the best baseline, or yardstick, by which to evaluate the implementation of the SmartConnect program and its ongoing performance. Regardless of whether a utility should be bound by forecasted cost-effectiveness showings, the policy goals underpinning AMI deployment can only be achieved through realizing the claimed benefits associated with AMI. Otherwise, customers are left "holding the bag" for a very expensive metering system.

The first step of reviewing the AMI business case was complicated by the fact that SCE's SmartConnect business case evolved through three iterations before the program was adopted. Moreover workpapers were not provided to support the final adopted values. In order to conduct its analysis, DRA reviewed the workpapers SCE submitted under its SmartConnect Phase 3 application (A.07-07-026), which identified 134 different costs and 50 benefits resulting from SmartConnect deployment.[32] SCE workpapers describe each of these in four "parts," which are supported with Microsoft Excel spreadsheets:

- **Part A**: **A single spreadsheet which provides a description of each cost and benefit on one tab.** Other tabs provide deployment period values for these costs and benefits and provide summaries for O&M costs, capital costs, and benefits. Annual values for 2007-2012 are provided for the costs, but not the benefits.
- **Part B: A single spreadsheet with two tabs.** The first tab summarizes post-deployment O&M and capital costs and groups them by the seven categories. The second tab summarizes O&M and capital benefits for both deployment and post-deployment periods.

[32] Approximately 120 of these costs categories were incurred in the deployment period, and 78 in the post-deployment period.

- **Part C**: Provides over 10,000 rows of data in one spreadsheet, with one row for each year of each cost and benefit. The nominal 2009 value, simple calculations, and general descriptors are provided including deployment/post-deployment, capital/O&M, and labor/non-labor.
- **Part D**: Provides multiple spreadsheets that show the detailed calculations of the annual values in Part C for many of the costs and benefits.

Separate errata and rebuttal workpapers supplemented the original spreadsheets. Workpapers were also provided to calculate the PVRR of the project, but DRA did not use those spreadsheets in this analysis. SCE workpapers Part C contained a wealth of information and were the basis of DRA's workpapers after three significant modifications were made. First, the format of "one line for each year of each cost and benefit" made review and charting difficult. DRA reformatted the data with 1) costs and benefits in rows and 2) annual and summary data in columns. Separate tabs are provided for capital and O&M data.

The second significant change was incorporating all data for the original, errata, and rebuttal workpapers into a single file, which was then adjusted to account for the settlement agreement. SCE states that it did not update its workpapers to reflect the final settlement adopted by the SmartConnect decision.[33] DRA therefore resorted to inferring these adjustments based on the adopted settlement.[34]

[33] SCE response to DRA data request (DRASmtCnt-SCE-KAR-002 question 2), received April 29, 2011.

[34] Appendix A to D.08-09-039. DRA's key witnesses in the SCE Phase III application have either left DRA or were otherwise unable to assist this team in its examination of the adopted costs and benefits.

The final adjustment was classifying the costs and benefits as either operational or Demand Response (DR). For costs, this was primarily achieved by reviewing the description of each cost and benefit and making a judgment call. DRA determined that most costs should be considered operational; to the extent that a given cost seemed necessary only to implement the DR and energy conservation programs, DRA classified it as "DR-specific." Both the original and errata testimonies (Exhibit SCE-3) and workpapers provided summary estimates of operational and DR benefits. DRA tested its allocation of benefits against this data and made adjustments as necessary.

The resulting workpaper was cross-checked against the settlement and original workpapers to ensure they were accurate within $0.05 million.[35] The final DRA workpaper allows easy review, sorting, and charting of summary data, or annual data for any year, for each cost and benefit.

Analysis of the recorded and requested costs required extensive discovery with SCE. Even though SCE was cooperative and timely in providing responses, the iterative nature of discovery resulted in some unresolved questions. Many of these questions relate to the final step of the analysis, which involves identifying the cost deviation between the AMI business case and subsequent filings. This effort was complicated by the fact that the cost categories in the AMI business case were not perfectly aligned with those used in subsequent proceedings. Note that DRA's analysis to-date is based on nominal values for each year of the business case, since there was insufficient time or resources to normalize values to a common year.[36]

[35] Figures in adopted settlement were rounded to the nearest $0.1 million.

[36] In its workpapers, SCE provided annual itemized cost data in nominal terms and separately provided a "revenue requirement model" by which (nominal) cost categories could be translated into revenue requirements. While it is more

Small, but noteworthy, errors may be encountered where costs and benefits calculated in different years are compared.

accurate to analyze revenue requirements as these are the real costs to ratepayers, DRA did not have sufficient information to be able to calculate revenue requirements for each individual cost-benefit item.

APPENDIX 5: List of Business Case Costs and Benefits

Changed/ Added	CB ID	Organization	Description
	C01.01	Business Customer Division	Additional FTEs will be needed to develop business customer education materials, address customers questions/inquiries and to conduct rate analysis for new rates enabled by the SCE SmartConnect™ program.
	C01.02	Business Customer Division	Additional FTEs will be needed to support business customer project management work related to the SCE SmartConnect™ enabled tariffs and programs during deployment.
	C02.01	Customer Communication Organization	SCE SmartConnect™ will result in the availability of customer usage data on the company website and thereby increase the number of customers calling with questions regarding access to the data and usage of the data provided.
	C02.02	Customer Communication Organization	Deployment will result in increased customers calls (i.e. 1st new bill, SCE SmartConnect™ welcome packaging including new Peak Time Rebate notification.) This identifies the incremental costs associated with completing the new calls.
	C02.03	Customer Communication Organization	Interval usage data from SCE SmartConnect™ meters will allow for the adoption of Time-of-Use (TOU) tariffs and will result in an increase in calls from medium size Commercial & Industrial customers who call to opt out of the default TOU rate.

	C02.04	Customer Communication Organization	Initial deployment of SCE SmartConnect™ will result in an increase in training costs for new hires and existing employees.
Settlement	C02.05	Customer Communication Organization	Prepayment services will result in an increase of customer calls to process payment and to provide answers to questions regarding this payment option.
	C02.06	Customer Communication Organization	The new remote service switch will enable SCE to disconnect customers for non-payment that could not be completed by field personnel, which will increase calls to the CCO to reconnect service and authorize SCE to energize their site.
	C02.07	Customer Communication Organization	The new remote service switch will require customers to make a 2nd call to the Customer Communication Organization to authorize their service to be energized .
	C02.08	Customer Communication Organization	Interval usage data from SCE SmartConnect™ meters will allow for the adoption of Critical Peak Pricing (CPP) and result in an increase in medium Commercial & Industrial customers who will call to enroll in a CPP rate or have CPP questions.
Rebuttal	C02.09	Customer Communication Organization	The Title 24 Programmable Communicating Thermostats/Advanced Load Control (PCT/ALC) program will result in an increase of customer calls regarding enrollment and questions about the PCT program.
Rebuttal	C02.10	Customer Communication Organization	The SCE (non Title 24) Programmable Communicating Thermostats/Advanced Load Control (PCT/ALC) program will result in an increase of customer calls regarding enrollment and questions about the PCT program.
	C02.12	Customer Communication Organization	Interval usage data from SCE SmartConnect™ meters will allow for the adoption of Time-of-Use (TOU) tariffs and will result in increase in calls from residential customers who want to opt-in to a TOU rate.

	C02.13	Customer Communication Organization	Residential and small C&I (=<20kW) will be automatically enrolled in the Peak Time Rebate (PTR) program, resulting in inquiries about PTR.
	C05.01	Corporate Communications	Customers will require communications regarding the rollout of SCE SmartConnect™ and impacts to them.
	C06.01	Corporate Real Estate	SCE SmartConnect™ deployment will require expansion/remodel/upgrade of the existing meter test facility to accommodate new meter testing.
	C06.02	Corporate Real Estate	Facility expansion resulting from SCE SmartConnect™ deployment will require an increase in project managers to support the expansion activities.
Settlement	C06.03	Corporate Real Estate	The net increase in call center and billing staffing will result in increased space requirements and associated facility costs.
	C06.04	Corporate Real Estate	The increase in Information Technology (IT) and SCE SmartConnect™ Program Management staff will result in increased space requirements and associated facility costs.
	C09.01	Energy Supply & Management	Enhanced real-time reporting capability of SCE SmartConnect™ will result in increased complexity of load forecasting modeling.
	C09.02	Energy Supply & Management	Expected decrease in amount of customers on fixed tariffs will decrease load forecasting accuracy.
	C10.01	Field Services and Meter Reading	Deployment of SCE SmartConnect™ meters will require training of new and existing field services and meter reading staff.
	C10.02	Field Services and Meter Reading	Higher attrition of meter readers during deployment results in the hiring of less experienced meter readers who are less productive.
	C10.03	Field Services and Meter Reading	Field service representatives will replace single-phased residential, network, and small C&I SCE SmartConnect™ meters that fail after installation.

Rebuttal	C10.04	Field Services and Meter Reading	Deployment of SCE SmartConnect™ meters will require a project management team (project managers, regional supervisors, and analysts) to monitor and support the effort.
	C10.05	Field Services and Meter Reading	Deployment of SCE SmartConnect™ meters will require additional personnel to install A-base meters and Unable to Complete meters.
Rebuttal & Settlement	C10.06	Field Services and Meter Reading	The capabilities of the new meter will result in more tamper detection cases. In addition, the investigation will be more costly as it will require special field visits, whereas SCE currently uses routine manual meter reading for this purpose.
	C10.07	Field Services and Meter Reading	The reduction in orders performed by field service representatives results in longer drive times between remaining orders and therefore an increase in field service representatives to perform the orders.
	C10.08	Field Services and Meter Reading	Collector Meters that contain batteries will require meters to be replaced every 5 years to replace the batteries.
	C10.09	Field Services and Meter Reading	Installation of SCE SmartConnect™ meters will require replacement of locking devices and barrels.
Errata	C11.01	Information Technology	Meter Data Management System (MDMS) Infrastructure, hardware and software licensing and maintenance costs related to data collection and processing for SCE SmartConnect™ meters, not including Architecture and Project Management costs.
Errata	C11.02	Information Technology	Meter Data Management System (MDMS) IT Application Services costs related to data collection and processing for SCE SmartConnect™ meters. Meters require configuration of MDM Commercial Off-the-Shelf package and interface with SCE legacy systems.

Errata	C11.03	Information Technology	Project management and IT architecture costs related to data collection and processing for SCE SmartConnect™ meters. Meters will require a configuration / installation of the Meter Data Management (MDM) Commercial Off-the-Shelf (COTS) package.
Errata	C11.04	Information Technology	Infrastructure costs for web enhancements required for SCE SmartConnect™ implementation. Enhancements are for customer participation in demand response programs and to accommodate the expected increase in customer web access to SCE.com.
Errata	C11.05	Information Technology	Application development and Project Management costs for web enhancements related to implementation of SCE SmartConnect™ . Enhancements are for customer participation in demand response programs and to accommodate the expected increase in web access.
Errata	C11.06	Information Technology	Hardware and software costs to support SCE SmartConnect™ telecommunication data management from front office to back office.
Errata	C11.07	Information Technology	Telecommunication hardware implementation and maintenance costs related to the installation of Infrastructure required to support SCE SmartConnect™ Telecommunication data management from front office to back office.
Errata	C11.08	Information Technology	Telecommunication costs related to purchase and maintenance of hardware, and software licensing for SCE SmartConnect™ Telecommunications Infrastructure.
	C11.09	Information Technology	IT infrastructure costs related to upgrades or replacment of SCE's existing load control system. The load control system is required to support SCE SmartConnect™ Demand Response programs.

	C11.10	Information Technology	IT application costs related to upgrades or replacement of SCE's existing load control system. The load control system is required to support the SCE SmartConnect™ Demand Response programs.
	C11.11	Information Technology	IT Project Management / IT Architecture costs related to upgrades or replacement of SCE's existing load control system. Load Control System is required to support the SCE SmartConnect™ Demand Response programs.
	C11.12	Information Technology	Telecommunication hardware implementation costs related to SCE SmartConnect™ Network Management Console, a subcomponent of the Data Center Aggregator. The sub-component is for controlling the SCE SmartConnect™ system and for system alert messages.
	C11.16	Information Technology	Planning, Preparation and Execution of all test phases related to the SCE SmartConnect™ Program.
	C12.01	Personal Computer Equipment	Increases in staffing will result in the purchase of additional personal computers. Costs are based on annual computer lease-proxy rate and service/repair costs.
	C13.01	Job Skills Training	The net increase in call center activity will require training specialists to develop and deliver training courses for new customer service representatives and SCE SmartConnect ™ training for all representatives.
	C13.02	Job Skills Training	Deployment of SCE SmartConnect™ meters will require training specialists to develop and deliver training courses for meter installation staff, revenue protection staff, and existing field services and meter reading staff.
	C13.03	Job Skills Training	Deployment of SCE SmartConnect™ meters will require training specialists to develop and deliver training courses for meter technicians, meter test analysts, and engineering and meter shop field operations supervisors.

	C13.04	Job Skills Training	The implementation of new rate options for residential customers will require training specialists to develop and deliver training courses for revenue services organization personnel.
	C13.05	Job Skills Training	The implementation of new rate options for business customers will require training specialists to develop and deliver training courses for business customer division personnel.
	C13.06	Job Skills Training	The SCE SmartConnect™ deployment will require training specialists to develop and deliver training courses for other customer solutions business unit personnel.
	C13.07	Job Skills Training	The net increase in call center activity in the rural districts will require training specialists to deliver training courses for new rural customer service representatives and SCE SmartConnect™ training for all rural representatives.
	C13.08	Job Skills Training	Deployment of SCE SmartConnect™ meters in the rural districts will require training specialists to deliver training courses for rural meter installation staff, revenue protection staff, and existing field services and meter reading staff.
	C13.09	Job Skills Training	The increase in training specialists and contractors will require supervision and project oversight support for the department.
	C14.01	Market Management	SCE SmartConnect™ implementation will require the development, production and distribution of customer welcome notifications which will include new rates options, programs and services.
	C14.02	Market Management	Implementation of SCE SmartConnect™ enabled optional residential TOU rates will require the development of a marketing campaign that notifies and educates our residential customers about the TOU rate plans and potential benefits.

	C14.03	Market Management	Implementation of SCE SmartConnect™ enabled Critical Peak Pricing (CPP) rates will require the development of a marketing and educational campaign to encourage our medium size Commercial & Industrial customers to enroll in CPP rates.
Rebuttal	C14.04	Market Management	Implementation of Programmable Communicating Thermostat (PCT) programs will require the development of a target marketing and educational campaign to encourage customers to enroll in the programs and participate in cycling events.
Settlement	C14.05	Market Management	Implementation of the SCE SmartConnect™ enabled PrePay program will require the development of a educational and promotional materials to communicate the benefits of the program and encourage customer enrollment through the call center.
	C14.06	Market Management	Implementation of the SCE SmartConnect™ enabled residential Peak Time Rebate (PTR) program will require the development of a educational and promotional materials to communicate the benefits of the program and encourage customers' participation.
	C14.07	Market Management	Implementation of the SCE SmartConnect™ enabled default Time of Use (TOU) rates for medium size Commercial & Industrial customers will require the development of a marketing campaign that informs customers about rate plan and potential benefits.
	C15.01	Market Research	Market research will be required during deployment and post-deployment of the SCE SmartConnect™ meters related to customer communications, program participation and rate opt-outs.

	C15.02	Market Research	Implementation of SCE SmartConnect™ enabled Time of Use (TOU) rates and Peak Time Rebate (PTR) program will require research and monitoring of <200kW customer participation and behavioral changes.
	C15.02	Market Research	Implementation of SCE SmartConnect™ enabled Time of Use (TOU) rates and Peak Time Rebate (PTR) program will require research and monitoring of <200kW customer participation and behavioral changes.
	C15.03	Market Research	Implementation of SCE SmartConnect™ Critical Peak Pricing (CPP) rates will require research and monitoring of CPP participation among 20-200kW business customers.
Rebuttal	C15.04	Market Research	The implementation of SCE SmartConnect™ enabled Programmable Communicating Thermostat programs will require research and monitoring of residential customers participation.
Settlement	C15.05	Market Research	Implementation of SCE SmartConnect™ web-based interval usage and cost information and the new Pre-Pay program will require research and monitoring of customer participation, utilization and program functionality preferences.
	C16.01	Electrical Metering Services	Meter technicians will be required to install all "complex" (CT-rated or 3-phase) SCE SmartConnect™ meters.
	C16.02	Electrical Metering Services	Deployment of SCE SmartConnect™ meters will require meter technicians, meter test analysts, and field operations supervisors to attend training courses.
	C16.03	Electrical Metering Services	Meter technicians will be required to address trouble reports and replace failed "complex" (CT-rated or 3-phase) SCE SmartConnect™ meters and to install antennas on CT-rated SCE SmartConnect™ meters.

Rebuttal & Settlement	C16.04	Electrical Metering Services	The tamper detection ability of the SCE SmartConnect™ meter and absence of monthly visits from meter readers will result in an increase in meter technicians to assist in revenue protection investigations related to 3 phase and CT rated meters.
	C16.05	Electrical Metering Services	Meter technicians will replace 3 phase and CT rated meter collectors due to battery failures after 5 years.
	C17.01	Engineering & Meter Shop	The deployment of SCE SmartConnect™ meters will require the purchase of a field validation tool for use during deployment and for troubleshooting meter failures.
	C17.02	Engineering & Meter Shop	Some Commercial & Industrial SCE SmartConnect™ meters will require engineering by technical specialists prior to installation.
	C17.04	Engineering & Meter Shop	All SCE SmartConnect™ meters will have to be acceptance tested, resulting in an increase in meter technicians to perform meter testing as well as costs for reconfiguration and purchase of testing new equipment.
	C17.05	Engineering & Meter Shop	The increase in meter engineering and testing work will require additional analysts support.
	C17.06	Engineering & Meter Shop	The installation of SCE SmartConnect™ meters will result in costs of salvaging old electronic meters.
	C17.07	Engineering & Meter Shop	A-base adaptors will have to be purchased to accommodate the SCE SmartConnect™ meter.
	C17.10	Engineering & Meter Shop	Failure of some SCE SmartConnect™ meters upon installation will result in cost to ship the meters back to the vendor.
Settlement	C17.11	Engineering & Meter Shop	The replacement of current meters with SCE SmartConnect™ meters will result in damage to the meter panels which will have to be repaired.

	C17.13	Engineering & Meter Shop	Expected life span for meter collector batteries will require the purchase of new batteries and replacement of failed batteries.
	C17.14	Engineering & Meter Shop	The purchase of antennas will be required for some CT-rated SCE SmartConnect™ meters.
	C17.15	Engineering & Meter Shop	Failure of some SCE SmartConnect™ meters within the warranty period will result in cost to ship the meters back to the vendor.
	C17.16	Engineering & Meter Shop	The failure of SCE SmartConnect™ meters will result in costs to salvage the failed meters.
	C19.01	Products & Services	There will be an increase in labor and non-labor costs to develop, implement and provide ongoing management of the SCE SmartConnect™ enabled web-based energy information program for all customers <200kW.
	C20.01	Supply Chain Management	SCE SmartConnect™ deployment will require additional meter handling resources to purchase, ship and manage inventory of new SCE SmartConnect™ meters to be installed by SCE, as well as additional training for existing and new personnel.
	C21.01	Predeployment Costs	Pre Deployment funding for SCE SmartConnect™ Project.
	C21.02	Predeployment Costs	The development of back office systems related to the 2007 Application considered as deployment acitivities and did not receive pre-approved customer funding.
	C21.03	Predeployment Costs	The development of Field Deployment costs related to the 2007 Application considered as deployment activities and did not receive pre-approved customer funding.
	C22.01	SCE SmartConnect™ Program Mgmt	The SCE SmartConnect™ program will require Finance and Compliance, Regulatory, and Overall Project Management efforts throughout the deployment.

Errata	C22.02	SCE SmartConnect™ Program Mgmt-MAA	The SCE SmartConnect™ program will require cost and benefit contingencies to help mitigate execution risks associated with a project of this nature and magnitude.
	C22.03	SCE SmartConnect™ Program Mgmt-MAA	A significant percentage of new SCE SmartConnect™ meters will be installed by an outside vendor.
Errata	C22.04	SCE SmartConnect™ Program Mgmt-MAA	The SCE SmartConnect™ deployment will require the purchase of meters for initial installation.
Errata	C22.05	SCE SmartConnect™ Program Mgmt-MAA	The SCE SmartConnect™ deployment will require the purchase of meters for customer growth.
Errata	C22.06	SCE SmartConnect™ Program Mgmt-MAA	The failure of SCE SmartConnect™ meters beyond the warranty period will require the purchase of replacement meters.
	C22.08	SCE SmartConnect™ Program Mgmt	The SCE SmartConnect™ program will require Management of Field Deployment throughout the deployment period.
	C22.13	SCE SmartConnect™ Program Mgmt	The SCE SmartConnect™ program will require Tariffs, Programs & Services efforts throughout the deployment period.
Errata	C22.14	SCE SmartConnect™ Program Mgmt	The SCE SmartConnect™ program will require Product Management efforts throughout the deployment period.
Errata	C22.16	SCE SmartConnect™ Program Mgmt	The SCE SmartConnect™ program will require Business & System Integration efforts related to the Meter Data Management System throughout the deployment period.

	C22.17	SCE SmartConnect™ Program Mgmt	The SCE SmartConnect™ program will require Business & System Integration efforts related to the Load Control System throughout the deployment period.
	C22.18	SCE SmartConnect™ Program Mgmt	The SCE SmartConnect™ program will require Business & System Integration efforts related to the Back Office System throughout the deployment period.
	C22.19	SCE SmartConnect™ Program Mgmt	The SCE SmartConnect™ program will require office space related to Overall Project Management efforts throughout the deployment period.
	C23.01	Revenue Services Organization	Deployment: Implementation of SCE SmartConnect™ will require manual exception processing for SCE SmartConnect™ bills that fail billing system validations and customer opt-out of Time-of-Use (TOU) rate schedules.
Rebuttal & Settlement	C23.02	Revenue Services Organization	Installation of SCE SmartConnect™ meters will uncover energy theft which will increase the number of revenue protection cases and customer inquiries.
	C23.03	Revenue Services Organization	Deployment: Implementation of SCE SmartConnect™ will result in additional resources needed to address usage validation issues such as providing bill verification support, and processing quality assurance checks on new rates.
	C23.04	Revenue Services Organization	Implementation of SCE SmartConnect™ will require regulatory and process improvement initiative support.
	C23.05	Revenue Services Organization	Post-deployment: Implementation of SCE SmartConnect ™ will require manual exception processing for SCE SmartConnectTM bills that fail billing system validations and customer opt-out of Time-of-Use (TOU) rate schedules.

	C23.06	Revenue Services Organization	Post-deployment: Implementation of SCE SmartConnect ™ will result in additional resources needed to address usage validation issues such as providing bill verification support, and processing quality assurance checks on new rates.
Settlement	C23.07	Revenue Services Organization	Prepaid Services program will require incremental program resources in Credit & Payment Services (CAPS).
Settlement	C23.08	Revenue Services Organization	Customers who participate on the PrePay program will require balance notifications to help them manage their energy consumption and costs and to be notified when their prepay balance is low.
	C23.09	Revenue Services Organization	Bill presentation costs will increase due to the projected volumes of customers enrolling in the Critical Peak Pricing (CPP) program.
	C24.01	TDBU Accounting	SCE SmartConnect™ meter deployment will increase handling costs at SCE district facilities.
	C27.01	TDBU Rurals	Deployment of SCE SmartConnect™ meters will require training of new and existing field services and meter reading staff for rural customers.
	C27.02	TDBU Rurals	Higher attrition of meter readers during deployment produces a lower productivity rate and therefore a higher number of meter readers will be required than if the attrition rate remained unchanged for rural customers.
	C27.03	TDBU Rurals	Field service representatives will replace single-phased residential, network, and small Commercial & Industrial SCE SmartConnect™ meters that fail after installation.
	C27.05	TDBU Rurals	Deployment of SCE SmartConnect™ meters will require additional personnel to install the meters and to supervise and support the installation for rural customers.

Rebuttal & Settlement	C27.06	TDBU Rurals	The capabilities of the new meter will result in more tamper detection cases. The investigation will be more costly as it will require special field visits, whereas SCE currently uses routine manual meter reading for this purpose for rural customers.
	C27.07	TDBU Rurals	The reduction in orders performed by field service representatives results in longer drive times between remaining orders and therefore an increase in field service representatives to perform the orders for rural customers.
	C28.01	Tariff Programs & Services	An increase in FTEs will be required to develop, implement and support the SCE SmartConnect™ enabled Critical Peak Pricing (CPP) program for our medium size C&I customers (20kW to 200kW).
	C28.04	Tariff Programs & Services	Medium size C&I customers who enroll in the SCE SmartConnect™ enabled Critical Peak Pricing (CPP) program will require event notifications, which will be communicated by phone or text messages.
	C28.05	Tariff Programs & Services	An increase in FTEs will be required to develop, implement and provide ongoing management of the SCE SmartConnect™ enabled Programmable Communicating Thermostat (PCT) program for Title 24 compliant new construction and retrofit project type customers.
	C28.06	Tariff Programs & Services	An increase in FTEs will be required to develop, implement and provide ongoing management of the SCE SmartConnect™ enabled Programmable Communicating Thermostat (PCT) program for SCE customers (Non-Title 24 project type customers).
Rebuttal	C28.07	Tariff Programs & Services	Incentive rebates will be provide to SCE customers who purchase and installation SCE compliant programmable communicating thermostats (PCTs) and enroll in the SCE SmartConnect™ enabled thermostat program.

	C28.08	Tariff Programs & Services	An increase in FTEs will be required to develop, implement and provide ongoing program management for the SCE SmartConnect™ enabled Peak Time Rebate (PTR) program for residential customers.
	C28.09	Tariff Programs & Services	There will be an incremental increase in costs to provide residential customers who would like personal Peak Time Rebate (PTR) day-ahead event notifications by voice and text messages.
Rebuttal added	C28.10		NEW -- Cost of PCT equipment for new construction and retrofits.
	C29.01	Transportation Services	The net increase in field service representatives (during deployment only) and meter technicians will result in an increase in vehicles and associated costs.
	C29.02	Transportation Services	Degradation of meter reading productivity during SCE SmartConnect™ deployment will result in an increase in meter reading FTEs and a subsequent increase in vehicles and associated costs.
	C29.03	Transportation Services	The increase in overtime hours worked by existing and new field services representatives and meter technicians during SCE SmartConnect™ deployment will result in an increase in maintenance costs associated with existing vehicles.
	C29.04	Transportation Services	The increase in network services engineering and construction personnel will result in an increase in vehicles and associated costs.
Rebuttal	C31.01	Program Services Center	Customer participation in the Programmable Communicating Thermostat (PCT) program (Title 24 project type customers) will result in additional FTEs to process customer enrollment and applications.

Rebuttal	C31.02	Program Services Center	Customer participation in the Programmable Communicating Thermostat (PCT) Program (Non-Title 24 project customers) will result in additional FTEs to process customer enrollment and applications.
Settlement	C32.01	HR Enterprise Change Office	Organizational change management activities will be required to support the implementation new business processes resulting from SCE SmartConnect™.
	C32.02	HR Enterprise Change Office	Career planning activities to support employees whose jobs will be eliminated or significantly changing as a result of SCE SmartConnect™.
Errata	C33.01	ERP	Other incremental costs to the SCE SmartConnect™ Program resulting from the delay in the ERP implementation of Customer Care Solutions (CCS) to 2013.
Rebuttal added	C38.01		NEW -- Societal cost of higher meter energy usage. Not included in cost-effectiveness analysis.
	B02.01	Customer Communication Organization	Improved accuracy of SCE SmartConnect™ meter reads is expected to result in decrease of calls from customers inquiring about inaccurate billing data.
	B02.02	Customer Communication Organization	Faster service reconnection will result in decrease of follow-up phone calls from customers.
	B03.01	Claims	Elimination of meter readers and field service representatives will result in fewer claims for vehicle-related accidents, injuries, and other incidents.
	B06.01	Corporate Real Estate	Reduction in meter reading and field service crews will cause reduction in facility costs.
Rebuttal	B07.01	Demand Response	Interval usage data from SCE SmartConnect™ meters will allow for the adoption of Time of Use (TOU) rates. Customers are expected to shift load from peak to off-peak times, thereby resulting in avoided energy and capacity purchases.

Rebuttal	B07.02	Demand Response	Interval usage data from SCE SmartConnect™ meters will allow for the adoption of Critical Peak Pricing (CPP). Customers are expected to shift load from peak to off-peak times, thereby resulting in avoided energy and capacity purchases.
Rebuttal	B07.03	Demand Response	SCE SmartConnect™ meters which can communicate with in-home devices will enable a Title 24 PCT/ALC load control program in which load can be curtailed for economic reason or system stability.
Rebuttal	B07.04	Demand Response	SCE SmartConnect™ meters which can communicate with in-home devices will enable an SCE PCT load control program (Non-Title 24 Project Required PCT Customer Installations) in which load can be curtailed for economic reason or system stability.
Rebuttal	B07.08	Demand Response	Interval usage data from SCE SmartConnect™ meters will allow for the adoption of a Peak Time Rebate (PTR). Customers are expected to shift load from peak to off-peak times, thereby resulting in avoided energy and capacity purchases.
Both	B07.10	Demand Response	Increase customer awareness of their energy usage and costs through SCE SmartConnect™ programs is expected to cause an energy conservation effect.
Errata	B07.11		C/B ID Deleted Per Errata (consolidated with B07.10).
	B08.01	Energy Efficiency	SCE SmartConnect™ interval meter capabilities will reduce data collection costs for required energy efficiency and demand response studies.
	B09.01	Energy Supply & Management	Improved forecasting will result in reduction in hour-ahead and real time purchases and sales.

	B10.01	Field Services and Meter Reading	The remote disconnect/reconnect feature of the SCE SmartConnect™ meter will reduce the number of field service representatives required to perform reconnect, disconnect, turn-on and turn-off orders.
	B10.02	Field Services and Meter Reading	Remote/Automated meter reading on demand will reduce the number of field service representatives required to perform billing inquiry pickup reads.
	B10.05	Field Services and Meter Reading	Reorganization of Meter Services Organization after SCE SmartConnect™ will reduce the number of managers.
	B10.06	Field Services and Meter Reading	Remote/Automated meter reading on demand will eliminate the need for meter reader supervisors to oversee meter reading activities.
	B10.07	Field Services and Meter Reading	Remote/Automated meter reading on demand will eliminate the need for supervising field service representatives to coordinate meter reading activities.
	B10.08	Field Services and Meter Reading	Remote/Automated meter reading on demand will eliminate the need for meter readers to perform manual collection of on-cycle meter reads, billing pickup reads and no read pickup reads.
	B10.09	Field Services and Meter Reading	Remote/Automated meter reading on demand will eliminate the need to refresh meter reading handheld devices currently scheduled every 5 years.
	B10.10	Field Services and Meter Reading	Remote/Automated meter reading on demand will reduce the number of field service representatives required to perform Basic Work Requests (BWR).
	B10.11	Field Services and Meter Reading	Replacement of Advanced Meter Reading (AMR) meters with SCE SmartConnect™ meters will result in elimination of monthly AMR meter reading fees after deployment 2012 and beyond.

	B11.01	Information Technology	SCE SmartConnect™ meter reading system is automated and customized for monthly reads. Current meter reading systems will be decommissioned, resulting in cost savings for hardware, maintenance and refresh.
	B12.01	Personal Computer Equipment	Decreases in staffing will result in the purchase of fewer personal computers. Benefits are based on annual computer lease-proxy rate and service/repair costs.
	B13.01	Job Skills Training	The reduction of Meter Readers & Field Service Representatives during steady state due to the remote/automated meter will result in fewer training specialists needed.
	B16.01	Electrical Metering Services	The meter sample test program performed by meter technicians will be deferred during SCE SmartConnect™ implementation.
	B16.02	Electrical Metering Services	Interval Data Recorder (IDR) meters will no longer require a field visit from meter technicians to install an IDR meter for rate changes.
	B17.01	Engineering & Meter Shop	The deployment of SCE SmartConnect™ meters will eliminate the need to purchase old electromechanical meters for new business and meter failures.
	B17.02	Engineering & Meter Shop	The installation of SCE SmartConnect™ meters will result in credits from salvaging old mechanical meters.
Rebuttal	B23.01	Revenue Services Organization	SCE SmartConnect™ will allow SCE to read and bill all sub-accounts on the same day, which will reduce payment lag, result in a one-time reduction of the overall Accounts Receivable balance, and reduce working capital interest expense.
	B23.02	Revenue Services Organization	Remote turn-off allows SCE to more readily disconnect customers for non-payment, which will help limit unpaid balances and result in reduced write-off.

	B23.03	Revenue Services Organization	Remote disconnect / reconnect will reduce back office processing of billing exceptions.
Settlement	B23.04	Revenue Services Organization	SCE SmartConnect™ will increase the accuracy of meter reads due to the elimination of manual processes, thereby reducing the number of billing exceptions during post-deployment.
Rebuttal & Settlement	B23.05	Revenue Services Organization	Prepaid electric services will result in cash flow improvement.
Settlement	B23.06	Revenue Services Organization	Prepaid electric services will result in reduction of bad debt expenses because prepaid customers will have improved (zero) credit risk compared to typical deposit customers, who may not have adequate deposit to cover bad debt exposure.
Rebuttal	B25.01	TDBU Engineering	The reduction in system peak demand from price response programs is expected to result in a deferral of certain transmission and distribution expenditures.
Rebuttal	B25.02	TDBU Engineering	The reduction in system peak demand from load control programs is expected to result in a deferral of certain transmission and distribution expenditures.
	B26.01	TDBU Operations	Hourly customer load data allows accurate transformer loading analysis, reducing overtime costs to replace failed transformers.
	B26.02	TDBU Operations	Remote meter communication enables SCE to reduce field visits to diagnose customer "no-power" calls where the meter is actually energized.
	B27.01	TDBU Rurals	The remote disconnect/reconnect feature of the SCE SmartConnect™ meter will reduce the number of field service representatives required to perform reconnect, disconnect, turn-on and turn-off orders for rural customers.

	B27.02	TDBU Rurals	Remote/Automated meter reading on demand will reduce the number of field service representatives required to perform billing inquiry pickup reads for rural customers.
	B27.07	TDBU Rurals	Remote/Automated meter reading on demand will eliminate the need for supervising field service representatives to coordinate meter reading activities for rural customers.
	B27.08	TDBU Rurals	Remote/Automated meter reading on demand will eliminate the need for meter readers to perform manual collection of on-cycle meter reads, billing pickup reads and no read pickup reads for rural customers.
	B27.09	TDBU Rurals	Remote/Automated meter reading on demand will eliminate the need to refresh ITRON meter reading handheld devices for rural customers.
	B27.10	TDBU Rurals	Remote/Automated meter reading on demand will reduce the number of field service representatives required to perform Basic Work Requests (BWR) for rural customers.
	B29.01	Transportation Services	Net reduction in field services personnel is expected to allow for a reduction in vehicles and associated costs.
	B29.02	Transportation Services	Net reduction in meter reading personnel is expected to allow for a reduction in vehicles and associated costs.
	B30.01	Workers Comp	Labor savings arising from the automation of meter reading, service disconnection and service reconnection will result in a corresponding reduction in workers' compensation.
	B36.01	Field Services and Meter Reading	Funds for removal of existing meters.
Rebuttal added	B38.02		NEW -- Societal benefit of increased energy theft revenue collected. Not included in cost-effectiveness analysis.