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Witnesses: L. Cagnolatti
P. Campbell
P. De Martini
J. Gregory
E. Helm
C. Hu
S. Kiner
L. Oliva



SOUTHERN CALIFORNIA
EDISON

An *EDISON INTERNATIONAL* Company

(U 338-E)

***EDISON SMARTCONNECT™ DEPLOYMENT
FUNDING AND COST RECOVERY***

Volume 2: Deployment Plan

Before the

Public Utilities Commission of the State of California

Rosemead, California

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EDISON SMARTCONNECT™ DEPLOYMENT FUNDING AND COST RECOVERY

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I.

INTRODUCTION

The purpose of this exhibit is to present a detailed description of the deployment plan for Edison SmartConnect™, Southern California Edison Company's (SCE's) proposed advanced metering infrastructure (AMI) solution and its related customer tariffs, programs and services. Through its deployment plan, SCE will accomplish the installation of Edison SmartConnect™ meters to all residential and small commercial customers below 200 kW (approximately 5.3 million meters) over a five-year period from 2008 through 2012 (the "Deployment Period"). SCE's proposed deployment plan goes beyond the technical and logistical aspects of installing a major new metering infrastructure. SCE's AMI system design and deployment plan entails a comprehensive effort to meet the six functional requirements of the Commission¹ and the additional functionality identified in the Phase I Settlement Agreement² through a new generation of metering, communications and data processing systems to enable the customer to make informed, intelligent decisions regarding their energy choices. In SCE's Phase II decision on pre-deployment, the Commission found that SCE has satisfied the Commission's functional requirements finding that "SCE's proposed AMI project will meet the minimum functionality criteria established by President Peevey."³

Chapter II of this exhibit provides a general overview of the Edison SmartConnect™ project and its deployment activities, objectives and functionality, including the project management structure, the overall deployment schedule, and a summary of costs and benefits. Chapter III details the planned activities and estimated costs and benefits for the Deployment Period based on the major functional areas of the Edison SmartConnect™ program: Acquisition of Meters and Communication Network Equipment; Installation of Meters and Communication Network; Implementation and Operation of New Back Office Systems; Customer Tariffs, Programs and Services; Customer Service Operations; and

¹ See "Joint Assigned Commissioner and Administrative Law Judges Ruling Providing Guidance for the Advanced Metering Infrastructure Business Case Analysis, in R.02-06-001, dated 02/19/04, pp. 3 and 4.

² See D.05-12-001 for All part "Settlement Agreement" filed with the Commission by SCE, DRA, TURN and CCUE.

³ D.07-07-042, Finding of Fact No.1.

1 Overall Program Management. Chapter IV provides a description of the estimated Contingency
2 required for deployment. Chapter V summarizes the estimated costs and benefits during the
3 Deployment Period, and includes estimated reductions in operational costs as well as avoided capacity
4 and energy costs due to new demand response capabilities. All the dollar estimates in this exhibit are in
5 nominal terms unless specified otherwise.

II.

OVERVIEW OF EDISON SMARTCONNECT™ DEPLOYMENT

This chapter provides a brief review of SCE's experience to date with advanced metering systems and describes SCE's overall approach to complete the system-wide deployment of the Edison SmartConnect™ meters, communications infrastructure, information technology (IT) systems and related new programs and services enabled by Edison SmartConnect™. This Chapter also identifies the total estimated deployment costs and benefits for each key deployment area.

A. Review of SCE's Experience with Advanced Metering Systems

Prior to undertaking the Edison SmartConnect™ business case analysis in 2004, SCE had already established itself as an industry leader in many respects:

- SCE has been a pioneer in developing, installing and operating automatic meter reading (AMR) systems with over 580,000 AMR meters installed;
- SCE also has over 20 years experience with advanced metering systems beginning with the Metricom meter in the late 1980s, with many still in service and through the 13,000 large commercial and industrial customers with Real Time Energy Meters (RTEM) meters initially installed earlier this decade; and
- SCE's two-way radio frequency telecommunications experience also includes one of the largest distribution automation networks in North America.

SCE's approach to AMI over the past three years has sparked a marked change in the industry definition of smart metering⁴ and availability of commercial products to meet this need. Since 2005, SCE set about a deliberate and collaborative process with metering and communication system vendors to influence their product designs toward SCE's vision of a smart meter that integrated the next generation of advanced metering functionalities and capabilities. SCE's vision included many new product specifications to enhance the metering function, such as an open flexible metering and communications platform, home area network interface and a fully integrated service switch in all

⁴ An example is the Texas Public Utilities Commission's smart meter rules issued in May 2007 that were based in part on SCE's requirements.

1 residential meters. In pursuing its vision, SCE became a key player and primary driver in bringing about
2 this “next generation” of metering systems, which have become a reality in the marketplace.

3 As a result of SCE’s efforts, Edison SmartConnect™ will not only meet the Commission’s
4 functionality requirements, but it will go even further to assure the long term feasibility of this major
5 infrastructure replacement program and lasting benefits for SCE’s customers. The improved metering
6 and communication systems now available result in a \$1 billion improvement in SCE’s financial
7 assessment since the initial 2005 cost benefit analysis was completed⁵, going from a negative net present
8 revenue requirement of approximately \$950 million to a positive net present value revenue requirement
9 of over \$100 million.⁶

10 **B. Description of Edison SmartConnect™ Project**

11 Deploying Edison SmartConnect™ meters to all residential and business customers under 200
12 kW (approximately 5.3 million) over SCE’s vast 50,000 square mile service territory within a five-year
13 period is a major undertaking requiring reliable technology and capable, responsive vendors, a
14 comprehensive deployment plan that seeks to reasonably mitigate risks, and provisions for
15 contingencies. When installed, Edison SmartConnect™ technology will provide a two-way interface to
16 each premise allowing for interval usage data in near real-time, direct communication to the meter to
17 assist SCE in completing customer service-related requests, pricing signals and messaging to
18 thermostats and load control switches at each premise, thus enabling valuable new dynamic tariff
19 programs and services as well as energy information to encourage energy conservation.

20 **1. Functionality of Edison SmartConnect™**

21 When completed, the Edison SmartConnect™ system will have the capability to
22 automatically read customers’ meters on a daily basis, process and store validated 15 minute interval
23 consumption data for C&I accounts and hourly data for residential accounts, and make stored data
24 available for internal use and externally to the customer for their use in managing their energy usage.

⁵ See A.05-03-026.

⁶ SCE’s cost benefit analysis results are presented in Exhibit SCE-3) of this Application.

1 The system will also be able to support automatic meter reading for gas and water meters that may be of
2 interest to gas and water utilities that overlap SCE's service area.

3 The Edison SmartConnect™ systems will provide the ability to turn electric services on
4 and off remotely and it will make energy use information available to the customer either via the internet
5 or directly through an in-home home area network (HAN) interface. SmartConnect will enable new
6 customer tariff programs and services including new time-of-use (TOU) and critical peak pricing (CPP)
7 rate options and enhanced residential smart thermostat load control programs. Edison SmartConnect™
8 will also provide improved energy forecasting methods to enhance SCE's energy procurement processes
9 and it will provide improved customer outage and transformer loading information that is expected to
10 reduce SCE's transformer replacement costs.

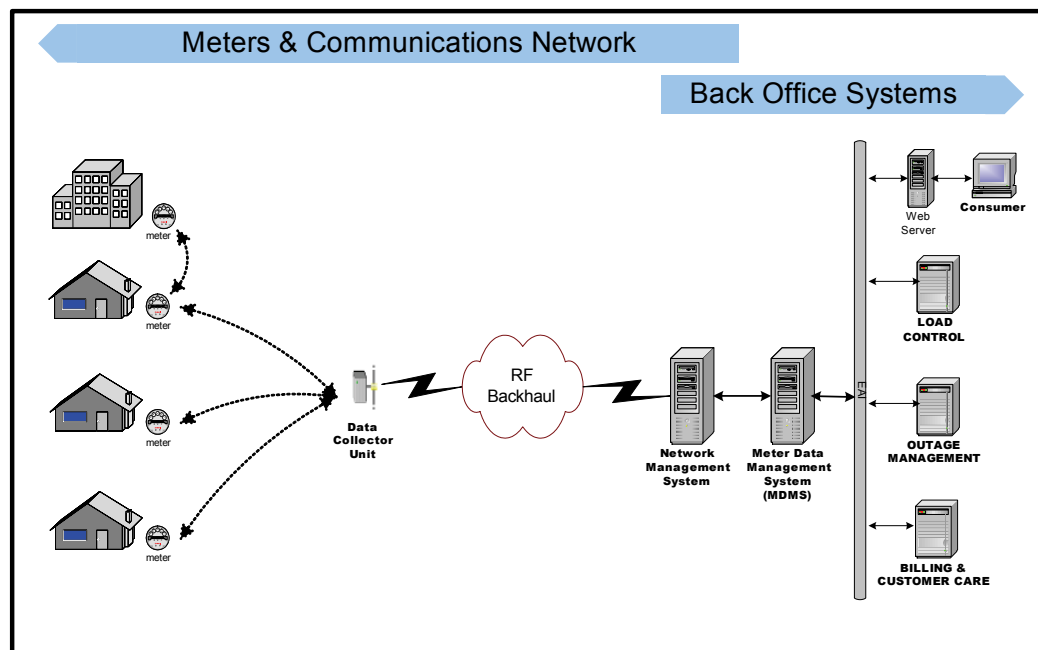
11 In order to deliver the expected benefits, SCE continues to work with the metering
12 industry to develop products that satisfy or exceed the design requirements of Edison SmartConnect™.
13 This new generation of meters is expected to deliver the following core functionalities:

- 14 • Two-way communication capability directly to each premise served by SCE;
- 15 • A minimum of 98 percent coverage for all electric customers in one system;
- 16 • Interval data in compliance with the Commission's requirements;
- 17 • Customer level voltage and tamper detection information;
- 18 • Enhanced outage information to aid assessment as well as restoration efforts;
- 19 • Integrated 200 amp electric service switch for most residential and small (under 20
20 kW) commercial customers (120/240V single phase service, 200 amps or less) with
21 load limiting capability;
- 22 • Integrated HAN interface using a non-proprietary open standard to enable messaging
23 to smart thermostats, in-home display, and/or customer devices;
- 24 • Communications interfaces to enable automated gas and/or water meter reading; and
- 25 • Remote upgrade capacity to the meter to support security and future flexibility.

2. Infrastructure Components

The infrastructure of the Edison SmartConnect™ project includes the advanced meters, the communication network and the new back office systems required to enable SCE to deliver the aforementioned functionalities. Figure II-1 shows how these primary components are divided between the field infrastructure (meters and communication network equipment) and the back office systems.

Figure II-1
Edison SmartConnect™ Infrastructure



The two primary aspects of deployment are: a) the implementation of this infrastructure and b) the execution of the various functionalities offered by this advanced system that will deliver customer value in terms of demand response and operational benefits.

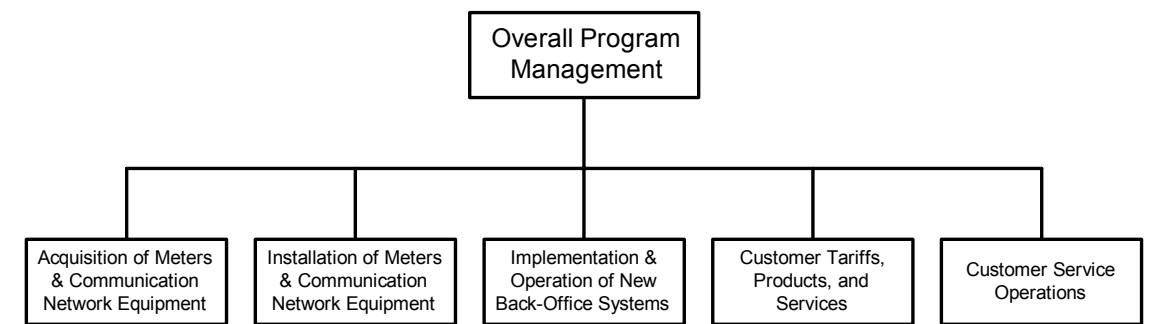
The components of the Edison SmartConnect™ system will collect, store, transmit, process, and transfer metering and other meter related data from various meter data collection points to various SCE network systems depending on the eventual application or use of the data (*i.e.*, billing, direct load control, outage management, energy procurement, *etc.*). Customers will also have access to their personal usage data for purposes of assessing their own energy usage patterns.

The essential elements of the meter and telecommunications network include the smart meters, the local area network (LAN) to collect and transmit the communicated meter, the wide area network (WAN) to backhaul the information to the utility data center, the Network Management System to manage and configure the network, and the Network Operating Center to provide network systems operations capability. The metering and communications network are described in more detail in Chapter III.A.2 below.

C. Description of Overall Edison SmartConnect™ Deployment Structure by Key Areas of Responsibility

As discussed in Section B above, Edison SmartConnect™ is a complex project of unprecedented scope and scale. In order to successfully execute this project, SCE organized the project management structure around the key areas of deployment. Central to this strategy is the use of industry best practices to manage the selection of the solutions and implement them in an efficient manner. As shown in the following Figure II-2, deployment activities are organized into four key functional areas of responsibility and the on-going Customer Service Operations that are impacted by the deployment process, each being implemented in accordance with industry best practices and incorporating its own past experience. Overarching these functional areas is the Program Management function, which provides project oversight of scope, schedule, budget and resources, as well as risk management for the entire program.

***Figure II-2
Organizational Structure of Edison SmartConnect™ Deployment***



The remainder of this volume is dedicated to detailing the execution of these key functional areas as described below:

- Overall Program Management – includes the oversight activities required to centrally manage a project of this scale and complexity, such as budgeting, compliance, and contract administration. It also includes risk-management, internal controls, and provision for contingencies needed to manage a project of this magnitude and complexity.
- Acquisition of Meters and Communication Network Equipment – includes the activities associated with selecting, purchasing, and testing the meters and the complementing communication network equipment that make up the field infrastructure.
- Installation of Meters and Communication Network Equipment – includes the field activities and vendor support required for installing the meters and communication network equipment.
- Implementation and Operation of New Back Office Systems – includes the activities associated with selecting and purchasing the new back office systems required to support the new metering infrastructure in addition to integration of these new applications with existing systems, and the expansion of the hardware necessary to accommodate the new applications and the exponential increase in customer usage information.
- Customer Tariffs, Programs and Services – includes the activities associated with developing, marketing, and administering the advanced tariffs, programs and services to customers that will provide the demand response benefits sought by the state’s Energy Action Plan and facilitate customer education of their energy consumption habits and corresponding costs to help them make better energy usage decisions.
- Customer Service Operations – includes the on-going phone center and billing operations that will be impacted during the Deployment Period. This includes both the incremental costs and the incremental benefits expected to occur as the number of new meter installations ramp up throughout the Deployment Period.

Each of these program areas plays a critical role in the delivery of project benefits to SCE’s customers. Each meter must: a) be properly and safely installed, b) be activated to securely communicate over the network in both directions, c) be recognized by the back office systems, and d) be enabled to deliver the new tariffs, programs and services to the customer. These areas are mutually

1 dependent on one another and require management oversight and quality assurance to ensure an efficient
2 deployment, accomplished in accordance with SCE's deployment plan and budget.

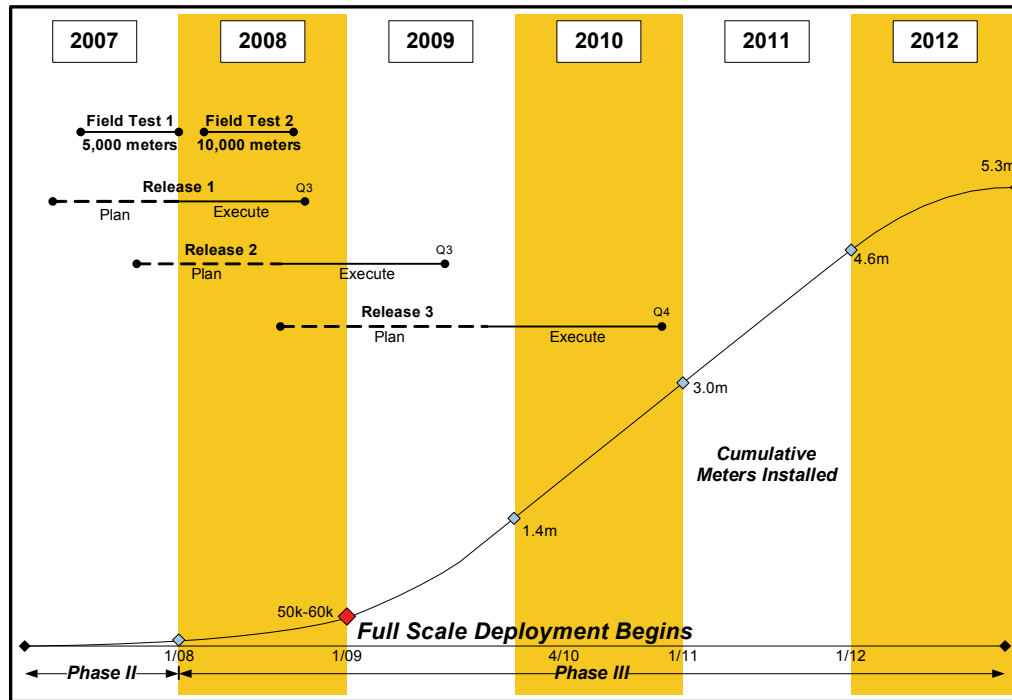
3 In SCE's deployment plan, the Customer Tariffs, Programs and Services functions are key
4 drivers for the other three deployment functions. Rather than having metering and data processing
5 constraints placed on new customer programs and tariffs (such as is the case today), with Edison
6 SmartConnect™, the metering and data processing systems have been designed to meet the needs of the
7 anticipated tariffs, programs and services. These critical interfaces are but one example of the level and
8 complexity of SCE's comprehensive deployment plan.

9 **D. Edison SmartConnect™ Release Strategy and Deployment Schedule**

10 SCE is planning to deploy smart meters to all residential and business customers (below 200
11 kW) beginning in 2008 with a second field test (Field Test 2) and ramping to full scale deployment in
12 January 2009 for completion in 2012. Concurrently, SCE will develop the back office systems to
13 support the operations and enable the new Edison SmartConnect™ functionality. Given the scale and
14 complexity of the functionalities enabled by Edison SmartConnect™, SCE plans to implement these
15 functionalities over three separate release periods. SCE may include a fourth release of functionality to
16 maximize the value to customers during the Deployment Period. Full functionality is expected to be
17 available by 2012.

18 Figure II-3 shows how the overall project schedule prioritizes the releases with the Field Tests
19 and the ramp-up of meter installations.

**Figure II-3
Deployment Schedule**



1. Release Strategy

The functionality of the Edison SmartConnect™ meters and back office systems will be implemented under three separate planned release periods, with each release providing additional customer support functions. As noted earlier, SCE may include a fourth release of functionality during the Deployment Period. Execution of the back office systems being developed in each release will be field tested as an integral part of the metering and communication system installation strategy.

a) Release 1

For Release 1, SCE will identify, design, develop and implement all the necessary enhancements to and integration with SCE legacy systems that will allow the collection of customer usage data from the Edison SmartConnect™ meter through the network management system and the Meter Data Management System (MDMS) to the billing system. This release will allow SCE to obtain customer usage information in a timely manner and produce an accurate bill for SCE's customers. These activities are also referred to as "meter-to-revenue" functions. There are additional core functions

1 that will be designed, developed and implemented as part of the Release 1 activities planned for
2 operation in 2008. These core functions include: completely automated meter reading, a semi-
3 automated service switch that will allow SCE to perform routine turn-on, turn-off, and
4 disconnect/reconnect orders remotely, the ability to provide customers with web-based interval usage
5 data (e.g., next day presentment – hourly intervals for residential customers and 15 minute intervals for
6 nonresidential customers), and in-home energy information for customers through the HAN. SCE will
7 execute the development of these Release 1 functions starting in early 2008 and expects to complete the
8 work by third quarter 2008. Starting in 2008, SCE plans to use the new Edison SmartConnect™ meters
9 for new meter sets supporting customer growth.

10 b) Release 2

11 In Release 2, SCE will design, develop and implement all necessary
12 enhancements and integration with existing SCE legacy systems that will allow SCE to offer new
13 customer-oriented programs such as load management programs and customer services such as customer
14 access to usage information through a web-based portal. As such, the functions in Release 2 will allow
15 SCE to fully automate the service switch in order to implement a completely automated service
16 connection and disconnection orders and enhance the revenue protection and meter tamper detection
17 functions in existing SCE systems. Importantly, in Release 2 SCE will develop and implement the
18 necessary enhancements to existing load management systems to be able to offer an expanded portfolio
19 of load control, demand response, and dynamic pricing options such as TOU, Peak Time Rebate (PTR)
20 and CPP. The Release 2 function will also include integration of the MDMS with the new customer
21 care systems that SCE will implement in 2009 as part of a separate deployment of SAP, a large
22 enterprise application.⁷ SCE expects to begin the Release 2 planning activities in the fourth quarter
23 2007 and expects to execute the development of these functions in mid-2008 and will be complete with
24 these functions by third quarter 2009.

⁷ In the event of changes to the SAP deployment, it may be necessary to alternatively enhance the existing systems to support the Edison SmartConnect™ functionality.

1 c) Release 3

2 In Release 3, SCE will design, develop and implement all necessary
3 enhancements to and integration with other existing SCE legacy systems that will allow SCE to improve
4 its energy forecasting and outage management functionality. In addition, the Release 3 functions will
5 allow SCE to further expand its portfolio of customer care services (*e.g.*, enhanced bill and payment
6 options). SCE will begin planning activities for the Release 3 functions in early 2008 and expects to
7 execute the system development of these functions in late-2008 and will be complete with these
8 functions by the 2011.

9 **2. Field Testing**

10 SCE's field testing started with Field Test 1, a pre-deployment activity that includes the
11 installation of as many as 5,000 Edison SmartConnect™ meters. Field Test 1 is focused on testing the
12 functionality and coverage of the two distinct field infrastructure solutions still being considered by
13 SCE. Field Test 1 results will ultimately determine the selection of SCE's primary metering and
14 communication system vendor. The metering and communication systems installed for Field Test 1
15 together with the initial Field Test 2 meters will serve as the testing ground for the execution of Release
16 1 functionality testing.

17 A primary purpose of Field Test 2, scheduled for the first half of 2008, is to work out the
18 intricacies of installation policies and procedures for the installation contractor and SCE's installation
19 team. Field Test 2 includes up to 10,000 meters and is designed to test the meter installation vendor
20 processes under high volume conditions. This will provide valuable information needed to facilitate the
21 transition to full scale deployment in January 2009. Field Test 2 will also serve as the testing ground for
22 Release 1 functionality in the second half of 2008. As shown in Figure II-3, full scale deployment is
23 targeted to begin in 2009 and will be completed in 2012. Starting in January 2009 and ending in 2012,
24 SCE plans to deploy Edison SmartConnect™ meters to all residential and business customers under 200
25 kW (approximately 5.3 million meters) at an average rate of about 6,000 meters per work day across
26 multiple separate regions simultaneously.

1 **E. Edison SmartConnect™ Deployment Costs and Benefits**

2 SCE's proposed deployment costs and the cost recovery mechanism presented in Exhibit SCE-5
3 supporting this Application include the costs and benefits expected to be incurred during the
4 Deployment Period.⁸ Pre-deployment costs incurred prior to 2008 have already been authorized in prior
5 proceedings and are currently being recovered through the Advanced Metering Infrastructure Balancing
6 Account (AMIBA). Costs and benefits incurred after 2012 (post deployment) are considered to be on-
7 going operating costs and will be recovered through future GRC proceedings. Edison SmartConnect™
8 costs have been isolated into these timeframes solely for ratemaking and cost recovery purposes.⁹

9 The estimated costs for the Edison SmartConnect™ project over the Deployment Period are
10 estimated at \$1.7 billion. Table II-1 summarizes the costs by program area during the Deployment
11 Period. Deployment period costs and benefits will be discussed in more detail in Chapter V of this
12 Exhibit.

⁸ This Application also requests authorization to transfer certain "deployment" costs proposed in this Application but incurred in 2007 and recorded in SCE's AMI Memorandum Account to the Edison SmartConnect Balancing Account upon a final decision in this proceeding, as contemplated in D.07-07-042, SCE's Phase II Decision.

⁹ SCE's Business Case for Edison SmartConnect™ is based on a net present value of all costs and benefits to be realized over the entire life of the project. This analysis is the subject of Exhibit SCE-3 of this Application.

Table II-1
Estimated Costs and Benefits During the Deployment Period
(Millions of Nominal Dollars, Rounded)

Line No.	Description	O&M	Capital	Totals
1.	Costs			
2.	Acquisition of Meters and Communication Network Equipment	1.6	836.5	838.0
3.	Installation of Meters and Communication Network Equipment	79.6	216.9	296.6
4.	Implementation and Operation of New Back Office Systems	41.4	149.8	191.2
5.	Customer Tariffs, Programs and Services Costs	112.1	0.0	112.1
6.	Customer Service Operations	78.9	5.2	84.1
7.	Overall Program Management	37.5	8.1	45.6
8.	Contingency	33.0	114.3	147.3
9.	Costs Totals	384.2	1,330.7	1,714.9
10.	Benefits			
11.	Operational	188.4	89.9	278.2
12.	Demand Response	144.4	71.8	216.2
13.	Benefits Totals	332.8	161.6	494.4

III.

DESCRIPTION OF KEY DEPLOYMENT AREAS OF EDISON SMARTCONNECT™

The four key areas of responsibility included in SCE's Overall Edison SmartConnect™ Deployment Structure along with the customer service operational impacts include:

- Acquisition of Meters and Communication Network Equipment
- Installation of Meters and Communication Network Equipment
- Implementation of New Back Office Systems
- Customer Tariffs, Programs and Services

This section provides a detailed overview and description of each of these areas of responsibility, including a discussion of the project management oversight for each area, the contingency planning and risk mitigation considerations, and a summary of the project cost estimates for each key area. In addition, this section describes the impact Edison SmartConnect™ is expected to have on SCE's on-going customer service operations and it will include an overview of the Overall Program Management and its key functions.

A. Acquisition of Meters and Communication Network Equipment

The Edison SmartConnect™ Program involves the acquisition and installation of over five million smart electric meters and a telecommunication network that enables two-way communications throughout SCE's 50,000 square mile service territory.

1. Overview of the Acquisition Processes

The Edison SmartConnect™ metering and communications systems will be selected through a rigorous and competitive vendor selection process. This selection process began in late 2005 as part of Phase I and continues through SCE's Phase II pre-deployment.¹⁰ The estimated expenditures for acquiring the metering and telecommunications network equipment are based on following considerations:

¹⁰ For additional details regarding SCE's vendor selection process, see Phase I and Phase II applications (A.05-03-026 and A.06-12-026) and Phase I Conceptual Feasibility Report released on August 7, 2006.

- The acquisition process was structured so that the selected vendors have sufficient resources, credibility, and expertise to supply necessary equipment and services to complete their work within the permitted timeframe and agreed budget. This also included detailed analyses and testing of vendor equipment by the program team and consultations with outside experts and other utilities with direct experience using or testing the finalist vendors' technology. The competitive bidding process resulted in a narrowed selection of solutions offering the best performance and financial value that will meet and exceed the Commission's functionality objectives.
- SCE has analyzed the uncertainties and risks associated with its selected technology options and developed appropriate measures to mitigate and manage these uncertainties and risks. For example, SCE is currently negotiating detailed terms and conditions with its selected vendors and suppliers so that SCE obtains the full value of procured materials and services and properly manages the risks of vendor or product non-performance. SCE included in its Request for Proposal (RFP) package a proposed set of terms and conditions that were developed with assistance from outside counsel.

2. Description of Meters and Communication Network Equipment

The essential elements of the meter and telecommunications network are:

- SCE specified smart meters to read and communicate the electric service data from each customer delivery point, and communicate directly with optional in-home thermostats and other compatible devices (and to have the ability to be reprogrammed and upgraded remotely;
- The AMI two-way LAN to collect and transmit the communicated meter data or support other Edison SmartConnect™ applications;
- The WAN to backhaul the information from the meter and LAN to the utility data center;

- The network management system (Network Management System) to manage and configure the network; and
- The Network Operating Center (NOC) to provide network systems operations capability.

As such, the purchase and installation of smart meters, modules, network equipment and systems and necessary infrastructure support is required and is the critical foundation to the Edison SmartConnect™ Program.

a) Data Capabilities

The final technologies SCE is considering for its Edison SmartConnect™ meters will deliver interval data on a pre-determined schedule that supplies data in 15-minute intervals for commercial customers and hourly intervals for residential customers. The customer usage data recorded at the meter will be retrieved periodically through the day and stored in a database for future operational uses and in support of any required tariff design structures. The Edison SmartConnect™ technology possesses the capability to collect more frequent interval data for residential customers. For example, SCE anticipates that it may use more frequent interval collection on customers participating in load control programs, customer samples for load research and distribution engineering analyses. The smart meters will be able to store interval data to at least a 5 minute frequency. While this can be implemented on an exception basis when required, the network system and back office systems SCE is designing would not support this frequency of meter data collection for all customers. Any proposed changes to retrieve greater amounts of data would need to be evaluated and a determination made whether additional costs would be necessary to upgrade the systems and infrastructure. This limitation is overcome, in part, with the ability of the smart meters to provide customers with direct access to near real-time 5 second interval data directly from the meter via the HAN interface.

b) Coverage Capabilities

Each electric meter will communicate via radio frequency (RF) communications network equipment installed throughout SCE's service territory. SCE serves a 50,000 square mile area, but nearly 88 percent of SCE's customers live within only 15 percent of the total area. SCE's

1 experience with two-way RF networks and the responses and test results by SCE and other utilities
2 provide a high confidence that a single RF network will be able to achieve the design objective of 98
3 percent or greater coverage. Depending on the final communications vendor selected, if a separate wide
4 area network service is required, the network will utilize either cellular service or a wireless broadband
5 service. In this regard, SCE continues to evaluate the wide area network options (*e.g.*, Cellular, Muni
6 WiFi, WiMax, BPL) as the market continues to evolve. If a separate WAN service is needed, SCE
7 expects to pursue a dual option in the network collectors for cellular and broadband backhaul. SCE also
8 intends to work with the selected vendor to ensure the products comply with SCE's Information
9 Assurance (security) requirements.¹¹ SCE anticipates a variety of means to reach the remaining 1-2
10 percent of customers utilizing alternate RF technology, telephone line, satellite, or possibly mobile for
11 the most challenging sites. SCE does not expect the AMI communications network choice to preclude
12 the potential use of SCE's distribution lines for broadband over powerline.

13 **3. Managing the Acquisition of Meters and Communication Network**

14 The acquisition process involved an extensive collaborative process that began with a
15 massive communications effort with several hundred prospective metering and communication systems
16 vendors. This effort started in November 2005 with a Request for Information (RFI) and will end with
17 the conclusion of the RFP process and the awarding of procurement contracts in late 2007. The RFP
18 process started in December 2006 with six sets of vendors, which was narrowed down to two sets of
19 vendors for field testing during Phase II. A third vendor's product will continue to undergo lab testing
20 in 2007. Each set of vendors represent an integrated field infrastructure composed of meters and
21 communication network equipment with a Network Management System. Final vendor selection is
22 expected by end of 2007.

23 SCE's requirements, as described in Section II.A.1, were a challenge for most vendors as
24 SCE sought to maximize the functionality and architectural flexibility of the proposed Edison
25 SmartConnect™ system within a relatively short timeframe. SCE found that the RF fixed network

¹¹ As defined in SCE's Metering and Telecommunications System RFP.

1 systems produced the optimal functionality, coverage and overall value for its customers. This is based
2 on SCE's plans to provide new customer choices for automated services, information and energy
3 management beyond what is offered today. Examples include: in-home energy information and
4 messaging, smart thermostat control, support for plug-in hybrid electric vehicles and distributed
5 resources metering, and contract automated gas and/or water meter reads. Edison SmartConnect™
6 systems will also support numerous functionality upgrades and enhancements in the future, thus
7 mitigating the risks of functional and technical obsolescence.

8 In summary, SCE expects that selected technologies will be effective, will achieve the
9 Commission's functionality objectives, and will meet the current and future needs of its customers and
10 utility operations. Based on RFP responses and initial negotiations, both finalist vendors' products meet
11 SCE's price targets needed for a cost effective business case.

12 a) Alternative Edison SmartConnect™ Technology Approaches Considered by SCE

13 During the RFI, RFP and vendor selection process, SCE analyzed a number of
14 meter and telecommunications technologies to determine which technology would be most appropriate
15 for SCE's specific service territory and customer base and which technology would provide the most
16 cost effective approach to achieve the functionality objectives articulated by the Commission and SCE.
17 SCE's evaluation process included the consideration of costs and benefits, functionality features (e.g.,
18 meeting basic remote interval reading requirements, and future adaptability) and risks (e.g., product
19 maturity, company stability, schedule, and technical risks) associated with each technology option.
20 SCE's rigorous vendor selection process began with a RFI in December 2005 that was sent to over 130
21 vendors worldwide and resulted in responses from 43 vendors. The AMI LAN technologies represented
22 included:

- 23 • Narrowband wireless network solutions utilizing mesh or licensed tower
24 based technologies;
- 25 • Power Line Carrier solutions;
- 26 • Wireless Broadband solutions; and
- 27 • Broadband over Power Line solutions

1 SCE gave careful consideration to each of the technologies within the context of
2 seeking to obtain smart meter and telecommunications technology that would provide a reasonable
3 assurance of meeting the Commission's functionality objectives and SCE's requirements for the Edison
4 SmartConnect™ Program at a cost-effective price and within the defined program schedule. This
5 includes a careful assessment of the vendors' ability to scale production and support to meet not only
6 SCE's procurement needs but the significant market demand in North America for AMI systems.

7 b) Current Status of Acquisition Process

8 SCE intends to replace all SCE-owned residential meters and commercial meters
9 up to 200 kW with new smart meters.¹² SCE's meter population includes a number of different types
10 and sizes to accommodate different customer service levels. All new Edison SmartConnect™ meters
11 will be shipped with the Edison SmartConnect™ functionalities already built into the meter. After a
12 long and rigorous vendor selection process, based on its detailed analysis of AMI technology options,
13 SCE has narrowed the choices to Cellnet/Landis+Gyr, Itron and Sensus for final evaluation to supply
14 technology for the Edison SmartConnect™ integrated meters and associated fixed radio frequency (RF)
15 network. SCE is confident that it will be able to make a final selection by the end of 2007 from among
16 these vendors.

17 Table III-2 shows how SCE's collaboration with meter manufacturers have
18 successfully resulted in a new generation of meters robust enough to effectively deliver benefits over the
19 long run.

¹² All SCE customers with demands exceeding 200 kW already have smart meters installed.

Table III-2
Edison SmartConnect™ Functionalities

Feature/Function	SCE's Design	Availability in 2005	Expected Availability by 2008
Remote Interval & On-Demand Reading	Yes	Yes	Yes
Maximum Power Consumption	Yes	Yes	Yes
Remote Curtailment – demand limiting	Yes	Yes	Yes
Remote Connect/Disconnect	Yes	Yes	Yes
Energy Use Display – Text messaging & enhanced features ²	Yes	Yes	Yes
>35 Days of On-Board Memory	Yes	Yes	Yes
Continuous Service Monitoring	Yes	Yes	Yes
Pre-payment	Yes	Yes	Yes
Multiple Data Ports	Yes	No	Yes
RF Link to In Home Devices ²	Yes	No	Yes
Wireless Link to Gas/Water Meters	Yes	No	Yes
Integrated Load Control ²	Yes	No	Yes
Two-leg voltage Measurement ¹	Yes	No	Yes
Integrated GPS	Yes	No	No
Multi-RTU Protocol ¹	Yes	No	No
>15 Year Life Expectancy	Yes	No	Yes
Energy Display Trip Counter ²	Yes	No	Yes
Local Area Sensor	Yes	No	No
Net Energy Measurement	Yes	No	Yes

¹This feature is available in limited instances, generally for commercial and industrial meter applications.

²With incorporation of an integrated HAN, this feature may be supported with “add-on” devices developed and marketed by other third party manufacturers.

4. Risk Management of the Procurement Process

There are various uncertainties and risks that may affect the procurement and installation of telecommunications equipment and network operations. SCE analyzed these uncertainties and risks including: vendor, technology, unforeseeable site/meter conditions, implementation and operations and is in the process of developing procedures and processes to effectively manage these uncertainties and risks.

a) Vendor Risk

SCE will manage vendor risk by selecting a firm that has the capability, financial standing and proven track record to support their technology and services. SCE has extensive commercial experience with the network vendors chosen to field test products. The communications

1 vendors remaining in consideration are among the top five industry suppliers in terms of installed base
2 for AMR/AMI networks. An integral element of SCE's RFP process for network vendors is negotiating
3 the terms and conditions that will reduce supplier related risks during the Deployment Period. SCE
4 expects certain price and performance warranties from its vendors based on the level and length of
5 business a project of this scale provides for the vendor community.

6 Similarly, SCE plans to utilize the same tactics for developing the terms and
7 conditions with meter suppliers. As stated, SCE is currently testing three meter manufacturers. To be
8 cost effective, SCE plans to select one meter manufacturer as the primary meter supplier to take
9 advantage of volume related discounts. However, to hedge against potential supplier concentration
10 related risks, SCE is also planning to select at least one additional meter manufacturer to provide
11 products during the Deployment Period.

12 b) Pricing Risk

13 SCE will manage this risk by contractually obligating each selected vendor to
14 deliver its products at the prices quoted in the vendor's competitive bid submitted as part SCE's RFP
15 process. SCE will also manage pricing risk by having at least two meter suppliers, at least one of which
16 is able to replace commercial as well as residential meters. As part of the RFP, each meter supplier will
17 be required to demonstrate that it can provide a meter that includes a communications card procured
18 from the communications supplier and a disconnect switch, among other required components,
19 integrated under the meter cover.

20 SCE anticipates the integration of the communications solution into two separate
21 meter vendors' products. The first of these integrated meter products (Meter 1) will be tested in Field
22 Test 1. Once the communications solution is selected at the end of 2007, that communications
23 supplier's communications card will be expected to be integrated into a second meter (Meter 2) which
24 will be tested in 2008, as part of Field Test 2. One of the two meter vendors is also expected to provide
25 commercial and industrial meters, which have been integrated with the communications solution.

1 c) Technology Risk

2 (1) Communications

3 SCE rigorously analyzed various technologies and their associated costs
4 prior to the choice of using a RF fixed network for Edison SmartConnect™. Based on functionality,
5 price, and risk, the RF technology for the Edison SmartConnect™ system provides SCE and its
6 customers with the greatest value. The basic metering and RF technology is proven and SCE has over a
7 decade of experience with one of the largest two-way mesh networks in operation.

8 (2) Assumed Meter Failure Rates

9 SCE conducted extensive lab testing, including accelerated life testing to
10 assess failure rates. Additionally, SCE and its consultant (the engineering and manufacturing division of
11 IBM) conducted manufacturing plant audits of the finalist vendors in Spring 2007. Lastly, SCE also
12 considered vendor technical and commercial information provided in the RFP responses to estimate
13 electric meter/module failure rates. The integrated meter failure rates incorporated into SCE's cost
14 estimates are based on vendor information and SCE's independent assessments. SCE estimates the
15 smart meters to have failure rates of no more than .5 percent¹³ and a service life of 20 years.

16 SCE is managing the risk of equipment failures through contractual terms
17 and an ongoing quality management effort with the vendors. SCE is establishing contract terms and
18 conditions related to product warranties and vendor liability for non-performance. SCE is proposing to
19 continue the effort begun in Phase II pre-deployment to actively engage the selected vendor in a quality
20 management program to ensure manufactured products and the component parts meet SCE's
21 performance requirements. SCE's quality management effort spans the entire supply chain from source
22 components to design and manufacture to acceptance testing and field performance evaluation. SCE
23 will continue to work with the vendor to ensure a robust quality management program and engaging the
24 upstream suppliers to ensure a reliable supply of quality components in order to minimize customer
25 impacts, potential safety hazards, and expensive replacements due to faulty equipment. SCE will also

¹³ SCE assumes that 1% of the smart meters will require site visits. Of the 1%, only .5% are assumed to be failures; the other .5% are assumed to be reusable.

continue to leverage consultants with industrial electronics engineering and manufacturing quality management to assist in site audits, root cause analysis and vendor performance reviews. SCE will perform acceptance tests on the meters and anticipates the intensity of acceptance testing will be higher during field tests and the earlier portion of mass installation, eventually ramping down to statistically significant sample standards as full deployment progresses. SCE plans to expand its existing industry leading meter testing facilities and leverage internal expertise throughout the Deployment Period.

5. Cost Elements for Acquisition of Meters and Communication Network Equipment

Table III-3 provides the estimated O&M and capital costs related to the acquisition of meters and the communication network. As shown in that table, 97 percent of these deployment costs are related to purchasing the key field infrastructure components: meters and communication network equipment. The remaining capital expenditures such as installation of a new conveyor belt system, one new demand board and two new test boards are required to support acceptance testing activities. Other capital expenditures include purchase of A-base adaptors and antennas to facilitate installation of Edison SmartConnect™ meters. This also includes the capitalized labor for performing the acceptance testing, engineering of a percentage of the complex meter installations, as well as project management of the meter vendors.

Table III-3
Estimated Costs for Acquisition of Meters and Communication Network
Equipment
(Millions of Nominal Dollars, Rounded)

Line No.	Description	O&M	Capital	Totals
1.	Cost of Meters and Communications Equipment	0.0	810.1	810.1
2.	Vendor Management & Acceptance Testing	1.6	26.4	27.9
3.	Totals	1.6	836.5	838.0

a) Cost Drivers for Meters and Communications Equipment Acquisition

There are essentially two key cost drivers for the capital costs in this program area. The first cost driver relates to the acquisition of the Edison SmartConnect™ meter that SCE will install throughout its service territory. The meter vendors' RFP responses met SCE's price point for

1 residential meters. However, actual meter costs may vary due to commercial meters and final negotiated
2 terms, including possible warranties on single phase residential meters.

3 The second key cost driver for the capital costs in this program area is the
4 communication network equipment installed in the field to facilitate the wireless exchange of
5 information in its 50,000 square miles service territory from the meter to SCE's back office systems.
6 The communication network equipment capital expenditures in this program area also includes the
7 network management system (referred to as the Data Center Aggregator or DCA in SCE's pre-
8 deployment application) that is required to compile the customer usage data from the meter or
9 disseminate information from its back office systems to the meter. Because the network management
10 system is bundled with the communication network equipment, the cost of the acquiring communication
11 network equipment, including the network management system is included in these estimates. However,
12 the forecast costs to integrate the network management system with SCE's back office are included in
13 the Implementation of New Back Office Systems section, Chapter III, Section C.4 of this exhibit.

14 b) Cost Drivers for Vendor Management and Quality Management Activities

15 The key functions that comprise the cost drivers for vendor management and
16 quality management activities are: vendor management of the meter and telecommunications vendor(s);
17 quality management personnel, consulting engineers, and acceptance testing; engineering and support
18 for a percentage of the complex meter installations. As shown in Table III-2, the estimated costs for
19 these functions are capital costs in support of the new meter installations. A relatively small portion of
20 the forecast O&M expenditures are costs associated with salvaging electronic meters to meet
21 environmental mandates.

22 The first activity, quality management, is the largest activity in this functional
23 area. SCE is proposing to continue the effort begun during pre-deployment to actively engage the
24 selected vendor in a quality management program so that manufactured products and the component
25 parts meet SCE's performance requirements. SCE's quality management effort spans the entire supply
26 chain from source components to design and manufacture to acceptance testing and field performance
27 evaluation. SCE will continue to work with the vendor to ensure a robust quality management program

1 and engaging the upstream suppliers to ensure a reliable supply of quality components in order to
2 minimize customer impacts, potential safety hazards, and expensive replacements due to faulty
3 equipment. SCE will also continue to leverage consultants with industrial electronics engineering and
4 manufacturing quality management to assist in site audits, root cause analysis and vendor performance
5 review. Product acceptance testing involves setting up the meters on test boards and performing
6 accuracy testing, functionality testing and communication testing on each individual meter until such
7 time that meter quality allows for a statistical sample of meters to be tested. The forecast capital
8 expenditures for the acceptance testing area relate to the tools and specialized equipment needed to
9 conduct the acceptance tests and the capitalized labor associated with performing the tests.

10 The second activity in this area relates to managing the meter and
11 telecommunication vendors that are selected through the RFP process. The vendor management costs
12 are capitalized during the Deployment Period. This critical activity involves managing vendors' product
13 development process to SCE's deployment timeline and the delivery schedule for the various products
14 required to meet its installation plan. Additional vendor management activities include working with
15 vendors to continue to improve their products and coordinating the industry standards development for
16 AMI technologies.

17 c) Expected Annual Expenditures for Acquisition of Meters and Communication
18 Network Equipment

19 Table III-4 shows the annual expenditures for the Acquisition of Meters and
20 Communication Network Equipment by capital and O&M expenditures during the Deployment Period.
21 As previously stated, SCE plans to initiate mass meter deployment in 2009 and complete this
22 deployment in 2012. During 2008, a small portion of the costs in this area will support the refinement of
23 mass deployment related policies, procedures, processes, and systems related to Acquisition of Meters
24 and Communications Network Equipment. Consistent with its deployment schedule, the expenditures in
25 this program area significantly ramp up in 2009 as the full deployment levels are reached.

Table III-4
Expected Annual Expenditures for Acquisition of Meters
and Communication Network Equipment
(Millions of Nominal Dollars, Rounded)

Line No.	Description	2007	2008	2009	2010	2011	2012	Totals
1.	O&M	0.0	0.0	0.3	0.5	0.5	0.3	1.6
2.	Capital	0.0	36.7	213.0	247.5	241.9	97.3	836.5
3.	Totals	0.0	36.7	213.4	247.9	242.4	97.6	838.0

B. Installation of Meters and Communication Network Equipment

Replacing the entire metering infrastructure in its service territory of 50,000 square miles is one of the most significant projects ever undertaken by SCE. During 2008, SCE will work with its meter and communication system installation contractors to refine the installation processes and integrate the contractors' inventory and work management systems with SCE's systems. A primary purpose of the field test scheduled for the first half of 2008 is to work out the intricacies of installation policies and procedures for the installation contractor and SCE's installation team.

1. Overview of the Installation of Meters and Communication Equipment

During the Deployment Period, SCE plans to deploy more than 5 million meters at an average rate of about 6,000 meters per work day. This rate of deployment is one of the industry's largest, but the daily rate of deployment is less than that successfully completed by Progress Energy.¹⁴ SCE will work with its selected primary contractor, to develop the detailed installation plan, taking into account a variety of factors, including:

- Maximizing operational and demand response benefits;
- Impacts on SCE's meter services operations and people;
- Coordination with SCE's T&D organization;
- Existing contract water and gas meter reading customers;
- Telecommunications network deployment; and

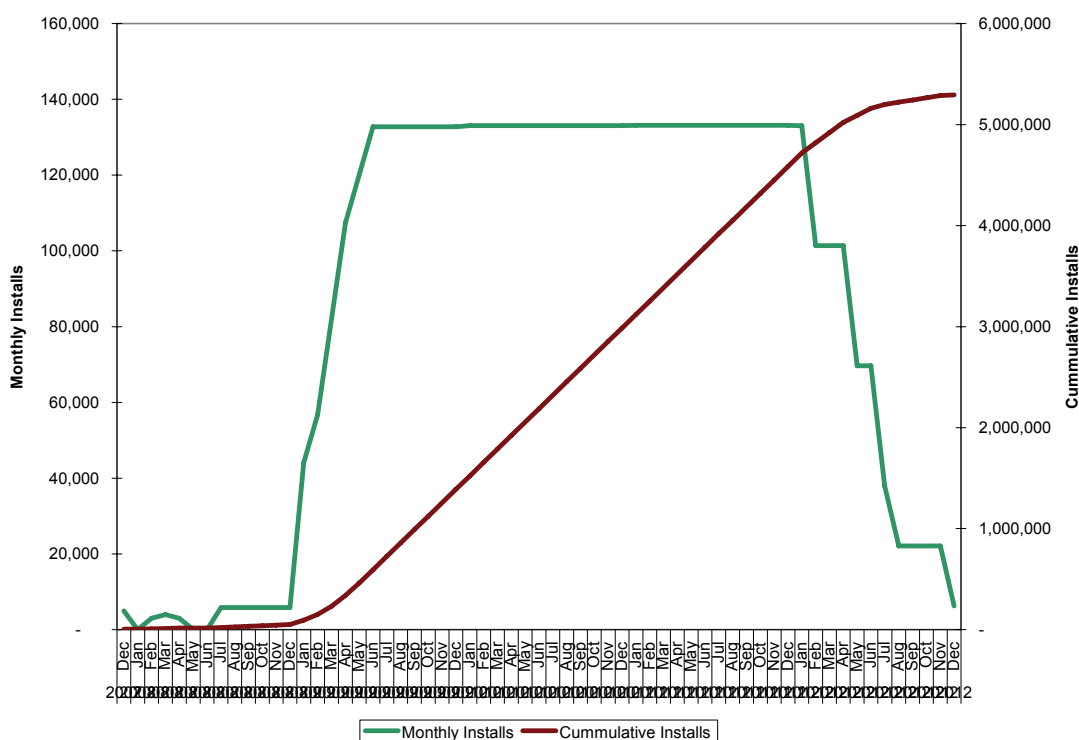
¹⁴ Progress Energy deployed about 2.5 million meters within two years at a peak average of about 10,000 meters/day. The meters were part of an AMR system, however, Progress Energy's electronic meter installation is comparable from a deployment process perspective.

- Program schedule, costs and risk considerations.

A final detailed deployment plan will be completed in mid 2008 after Field Test 2 results.

The AMI communications network equipment installation plan will depend on the final communications vendor selected, because their technologies have different installation requirements. One vendor's collector is installed in the base of the meter, another vendor requires a pole-mounted collector/radio and the third vendor utilizes a tower based network. The telecommunications vendor will be selected at the end of 2007 and the experience of the field test in Phase II will also influence the final plan. Figure III-4 below illustrates the overall meter installation plan.

**Figure III-4
Installation Plan**



2. Installation of Meters and Communication Equipment Planned Activities

Approximately 92 percent of SCE's current meter population are simple, routine, single phase meter installations, primarily residential and small commercial (under 20 kW) that can be accomplished by personnel with only a moderate level of training and technical expertise. The other 8 percent of meter retrofits are more complex metering systems, usually associated with medium size

(over 20 kW) commercial customers, difficult to access residential meters and new customer meter sets. SCE conducted an extensive benchmarking survey of utility meter deployments in North America to determine industry best practices for mass meter installation. In that effort, SCE visited PG&E, SDG&E, Dominion, We Energies, Progress Energy, PECO, and PPL. It became clear that the challenge of such a major undertaking on SCE's existing workforce would be very costly not only from the standpoint of the program, but also in terms of the impact it would have on SCE's employees and its on-going operational functions, which must continue in parallel for the existing meters while field installations of the new smart meters are taking place over a five year period. Based on industry best practice, SCE has decided to outsource 83 percent of the total meter installs to a specialized deployment contractor using union labor for the installation of the field infrastructure, composed of both the meters and communication network equipment. This approach not only offers the lowest potential cost, but also reduces the overall operational and program risk. SCE will staff a project management team to oversee the Field Deployment including both the deployment contractor and SCE's deployment team which will be installing the remaining 17 percent of the total meters during the Deployment Period.

a) Outsourced Installations

SCE utilized a thorough RFP process at the beginning of pre-deployment phase to identify and select a qualified deployment contractor. SCE leveraged the best practices and lessons learned in the industry in developing its RFP. For example, SCE negotiated a Project Labor Agreement with Local 47 of the International Brotherhood of Electrical Workers (IBEW), that provides labor rates and work rules for the Edison SmartConnect™ program so that vendors would be able to respond to the RFP with a key input (labor costs) known in advance. In addition, SCE also provided contractual terms and conditions as part of the RFP to consider commercial terms as part of the evaluation. SCE's procurement process included an evaluation of the proposals and a best and final proposal from a selected group of contractors. SCE's final evaluation included an extensive due diligence process for the selected contractors including:

- Inspection of contractors' facilities at reference utility clients
- Inspection of contractors' completed and active job sites

- Interviews with contractors' employees
- Assessment of contractors' management team
- Assessment of contractors' policies and procedures, including safety
- Assessment of contractors' ability to scale to support the size of SCE's deployment
- Interviews with contractors' past and existing utility customers

SCE has elected to use a single deployment contractor based on the contractor responses to the RFP, results of due diligence, compliance with SCE's proposed terms and conditions, deployment risk assessment, and the contractors' final price proposals. SCE selected Corix as its meter deployment contractor. Corix (formerly Terasen Water and Utility Services) is based in Surrey, British Columbia and has more than 65 years of experience designing, building, and managing vital utility infrastructure systems. Corix's utility-based business practices, management and organizational capability, inventory and deployment processes and systems, and pricing provided the best match to SCE's objectives. This deployment will be Corix's largest to-date, but SCE's due diligence indicates that they will be able to scale to meet SCE's needs and have sufficient organizational maturity to be successful over the Deployment Period.

b) SCE Installations

The 17 percent of meters to be installed by SCE resources are composed of: a) about 8 percent for replacement of existing meters for medium commercial customers (20kw to 200kw), b) about 3 percent for replacement of existing residential and small commercial (<20kw) customers that the deployment contractor is unable to complete for reasons such as access issues, and c) about 6 percent for new meter sets for residential and small commercial customers during the Deployment Period. All SCE installations will be performed by SCE employees. Meter Technicians will be used to replace existing and perform new meter sets for all complex commercial meters, including three phase self contained meters, Current Transformer (CT) and Potential Transformer (PT) meters. Field Service Representatives will perform new meter sets, replace all meters that the deployment contractor is unable to complete, and perform all A-Base meter replacements.

3. Managing the Installation of the Metering and Communications Network

The meter deployment will be based upon a detailed meter installation plan. In order to execute the installation plan, numerous logistics must be coordinated including supply chain, material availability, facilities, training, workload management, data management, customer communications and personnel/resources. The Deployment Contractor, Corix, will provide sufficient management support and organizational structure to provide leadership and staffing over critical implementation functions including safety, planning, performance tracking, work order management/data management, dispatching, customer call center/communications, training, human resources, inventory management, IT, quality assurance and field supervision/technicians. The Corix on-site project resources required at peak installation output times is estimated at 215 full time equivalents. Varying levels of Corix corporate support will also be required during deployment.

SCE will staff a field deployment organization to manage the deployment contractor as well as coordinate with other deployment-involved organizations within SCE. The SCE Field Deployment Organization will consist of the following major functional groups: safety compliance, field logistics & supply chain management, performance tracking, analysis and planning, quality assurance, project management over SCE resources, and contractor management. Detailed project plans will be developed with specific accountability assigned to the various field deployment resources to keep the deployment on schedule. Business processes and required interfaces will be developed in detail and tested as part of Field Test 2 prior to beginning full deployment.

The installation of the communications network will be managed by the Field Deployment Organization. If the selected communications technology requires pole-mounted radios/collectors, a contractor will be hired to complete the installations. These installations will be coordinated with the meter installations to maximize the benefits realized and mitigate potential operational issues. The business case reflects pole-mounted collectors, which is a conservative approach to estimating the cost impacts. Should the collectors ultimately be part of the meter itself, then the actual cost for this activity will be reflected in the cost recovery mechanism so that customers only pay for the actual costs incurred. This cost recovery mechanism is described in Exhibit SCE-5.

4. Risk Management of the Metering and Communications Network Installations

Through detailed planning and risk assessment, business processes will be developed ahead of time to deal with a majority of issues expected to be encountered during deployment. Mitigation strategies have also been discussed for other issues that may arise. The principal installation related risk areas and mitigation measures are:

- Vendor Installation Quality: Contract terms with incentives and penalties to align contractor interests with SCE's interests to ensure accurate installations and transfer of installation data.
- Vendor Staffing and Productivity: SCE has negotiated a Project Labor Agreement with IBEW Local 47 pay rates into the deployment contract. The pay rates are similar to the rates SCE has had success with hiring and retaining employees to perform the type of work the contractor employees will be performing. Should the deployment contractor fall significantly behind schedule, the terms of the agreement allow for a second contractor to be engaged.
- Vendor Default: In the event the deployment contractor defaults, SCE has contractually required access and the ability to continue to use Corix's work and inventory management systems which would significantly shorten any downtime should this occur.
- SCE Installation Productivity: If SCE's deployment efforts fall behind schedule, the deployment vendor does have the capability to provide the requisite skilled union personnel to augment the SCE deployment team.

5. Estimated Costs for Installation of Meters and Communication Network

Table III-5 shows the estimated O&M and capital costs needed to install Edison SmartConnect™'s field infrastructure during the Deployment Period. These forecast costs are comprised of two functions: Outsourced Installations and SCE Installations. As shown in Table III-5, 74 percent of the estimated costs for this program area relate to capital expenditures. Over half of these total forecast capital expenditures are for Outsourced Installations. All of the estimated O&M expense

relates to certain aspects of SCE Installations. The cost drivers are discussed in subsequent portions of this section.

Table III-5
Estimated Costs for Installation of Meters and Communication Network
(Millions of Nominal Dollars, Rounded)

Line No.	Description	O&M	Capital	Totals
1.	Outsourced Installations	0.0	121.2	121.2
2.	SCE Installations	79.6	95.8	175.4
3.	Totals	79.6	216.9	296.6

a) Cost Drivers for Outsourced Installations

The Outsourced Installations activity has one primary cost driver that is the cost per meter installed by the selected installation vendor(s). The scope of Outsourced Installations involves the installation of residential and small commercial meters and related communication network equipment. The deployment contract is largely based on a cost per meter successfully installed unit cost. This unit cost includes the vendor(s)'s overhead and other activities required to support the installations, such as temporary meter warehousing. Prior to mass meter installation, SCE will work with the selected vendor to prepare the necessary installation policies, safety procedures and systems required for mass meter deployment.

b) Cost Drivers for SCE Installations

The \$175.4 million forecast in this category is comprised of \$79.6 million in O&M expense and \$95.8 million in capital expenditures. The capital expenditures comprise 56 percent of the total SCE Installations costs. There are four key activities that make up SCE Installations function. The single largest activity in this area is the meter installation; specifically, all the meter installations due to normal customer growth; the installation of A-base adapters in order to accommodate new Edison SmartConnect™ Meters, replacing existing meters with Edison SmartConnect™ meters where the outsourcing vendor was unable to complete the installation due to access or other issues, replacing existing meters with Edison SmartConnect™ meters for three phase self-contained and all CT rated services, and immediate supervision of the personnel who are installing

1 meters, meter service hardware and software tools, replacement of meters that fail after installation, and
2 increased costs of meter handling.

3 The second major capital cost driver is the program office management oversight
4 of the installation activities. This includes costs for managing the installation vendor(s), including
5 ongoing monitoring of the vendor(s) installation practices and monitoring the execution of SCE's
6 installation plan. This activity also involves managing integration of installation activities between the
7 vendor(s) and SCE resources such as supply chain management, meter field operations, customer call
8 center, billing, and distribution field operations.

9 There is also a considerable amount of O&M expenditures that relate to SCE's
10 field services resources that will support the Edison SmartConnect™ deployment. The Edison
11 SmartConnect™ meter is substantially more sophisticated than the electromechanical meters that it will
12 replace. As such, new technical skills are required to provide ongoing operations and maintenance as
13 well as incremental staff to service the large fleet of meters after they are installed beginning in 2009.
14 The estimated cost associated with SCE's incremental O&M associated with the Edison
15 SmartConnect™ meter during deployment is approximately \$79.6 million in O&M expenses. These
16 costs include development and implementation of training for the individuals who will be installing
17 Edison SmartConnect™ meters, increased travel time as the number of employees in the field are
18 reduced, and increased detection of meter tampering and energy theft investigation activities by SCE
19 during the meter installation process.

20 Currently, meter readers identify potential meter tampering while performing their
21 regularly scheduled meter reading routes. As the Edison SmartConnect™ meters are deployed, contract
22 installers will conduct a visual inspection to identify potential tampering and energy theft and through
23 the tamper detection flag in the meter. Where it is determined that tampering and or energy theft may
24 exist, a revenue protection investigator will be sent to the site to confirm and/or resolve any meter-
25 related issues. For higher voltage three phase and all CT-rated services, the revenue protection
26 investigators must be accompanied by a meter technician. The remote service switch will reduce the
27 number orders that will be worked by Field Service Representatives (FSRs) in the field. This will result

in a reduction of the number of FSRs performing the remaining work and increase the travel time between orders. This resulting increase in travel time requires a lesser reduction in FSRs in order to continue to perform the volume of work remaining.

In addition, the O&M expense includes the costs associated with the repair of meter panels damaged as a result of a meter installation. Many of SCE's existing meters were installed decades ago, and over time, the customer's meter panels have deteriorated. The advanced age of many of the meter panels as well as the fact that a significant population of meters are in coastal areas are expected to contribute to a percentage of deteriorated meter panels. As such, replacing these existing meters may require repair or replacement of the customer's meter panel resulting from damage which may occur during the meter change.

c) Expected Annual Expenditures for Installation of Meters and Communication Network Equipment

Table III-6 shows the annual expenditures for the Installation of Meters and Communication Network Equipment capital and O&M during the Deployment Period. As previously stated, SCE plans to reach full deployment levels in 2009 and complete deployment in 2012. A small portion of the total costs in this area will support the refinement of mass deployment related policies, procedures, processes, and systems related to Installation of Meters and Communications Network Equipment in 2008. Consistent with SCE's deployment schedule, the capital expenditures in the program area ramp up significantly in 2009 as the deployment gets underway.

Table III-6
Expected Annual Expenditures for Installation of Meters
and Communication Network
(Millions of Nominal Dollars, Rounded)

Line No.	Description	2007	2008	2009	2010	2011	2012	Totals
1.	O&M	0.5	11.5	14.2	18.9	20.9	13.6	79.6
2.	Capital	0.0	3.5	52.3	62.2	64.1	34.9	216.9
3.	Totals	0.5	15.0	66.5	81.1	85.0	48.5	296.6

C. Implementation and Operation of New Back Office Systems

To understand the scope of the integration and implementation, it is necessary to understand the scale of the Edison SmartConnect™ system compared to how SCE operates today. Today, SCE receives 12 meter reads a year from typical residential customers. In the future, SCE will receive 24 hourly intervals each day for each customer with an Edison SmartConnect™ meter. After full deployment of the Edison SmartConnect™ meters, SCE will collect in excess of 120 million interval reads per day from SCE's customer base. This massive increase in data volume drives intense data processing and storage requirements needed to support the new meter capabilities and increased volume or reads. This translates into as many as 126 processors in 68 servers for the MDMS alone. While this reflects the majority of the infrastructure cost necessary to support Edison SmartConnect™ back-office, additional incremental infrastructure is required for integration with Network Management System as well as the load management system, billing systems, web portal and other SCE systems to support enhancements and integration between systems.

As part of the pre-deployment activities, the information systems effort includes the procurement, design, and initial development of the Meter Data Management System (MDMS). For deployment, the Edison SmartConnect™ information systems will access and process the data generated by the Edison SmartConnect™ meters and any in-home devices supporting future Edison SmartConnect™-enabled programs. To accomplish this, the information systems effort will include the development of the Network Management System, complete the development, integration and overall systems testing of new Edison SmartConnect™ systems begun during 2007, with existing SCE systems, as necessary, to provide a seamless operational transition of existing business processes to the new automated processes being introduced by Edison SmartConnect™. Additional new software and enhancements to existing systems will be required to fully develop the Edison SmartConnect™ functionality. The development cost estimates include the SCE resources and consulting support needed to complete the implementation of the new back office systems.

In addition, effectively operating the installed Edison SmartConnect™ system requires a team of qualified and dedicated personnel to manage the ongoing operation and maintenance of the new

communications system and smart meters. SCE is planning to add incremental staff to manage and control the Edison SmartConnect™ system through effective processes and via the Network Management System software provided by the telecommunication network technology vendor and an AMI Network Operating Center. Network operations will monitor, control, manage, and respond to the system and its key operating system indicators. The operations functions will include:

- Balance meter data loading and other operational demands required of the Edison SmartConnect™ network to ensure high system performance and reliability;
- Develop metrics and provide regular system reports;
- Identify and resolve system performance issues;
- Manage meter and telecom network configuration including security and remote firmware upgrades; and
- Control user configuration and access.

1. Overview of the New Back Office Systems

The Back Office Systems program area is responsible for managing all of the activities associated with identifying and designing the appropriate business process requirements for the Edison SmartConnect™ information technology needs and then designing, developing, procuring and implementing the resulting automation (hardware and software) that will be required to establish two-way system communications between meter at the customer's premise and SCE's back office systems (e.g., SCE's legacy customer care systems, load control systems, outage management systems). Critical elements of the new back office systems include the design, development and deployment of the Network Management System, MDMS, load control systems, billing system enhancements, web portal development for energy information and program support, along with integration between these systems and other SCE's legacy systems such as outage management. Each of these areas is described in more detail in the sections that follow.

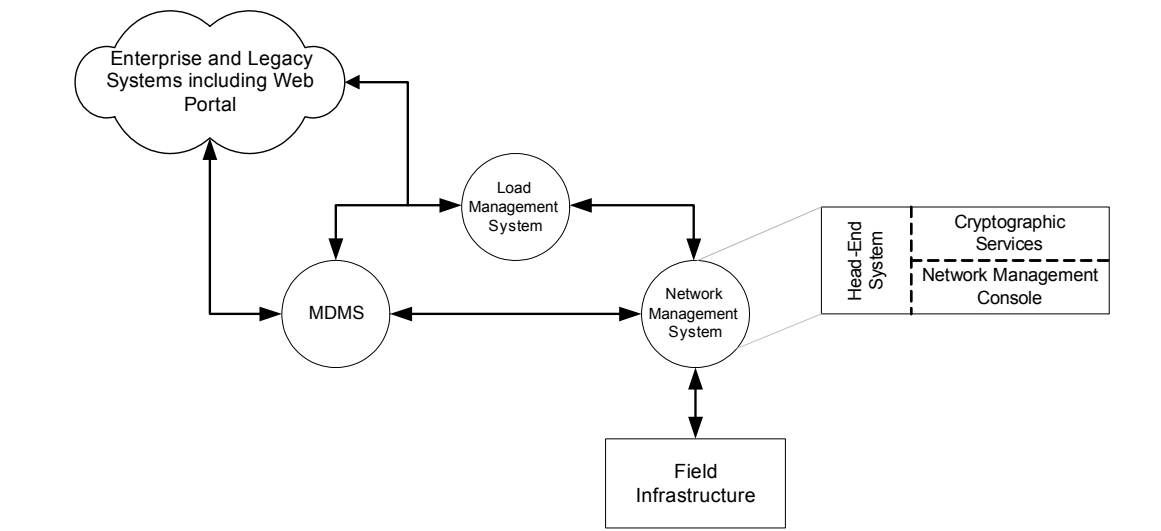
SCE determined that, in order to effectively manage the scope and complexity of the overall back office system integration and enhancements, the system development work would need to be conducted through multiple software development cycles or releases. As part of SCE's detailed

planning for deployment, SCE identified three distinct releases for the systems development work associated with back office systems enhancements and integration. These releases are described in detail in Chapter II.C of this Exhibit.

2. New Systems and Enhancements

Figure III-5 below depicts the relationship between the Edison SmartConnect™ back office systems. The lines in between the systems represent integrations that transfer data and information between the systems that allow each system to operate and enables the Edison SmartConnect™ business processes. Each system and their required integrations are described below.

Figure III-5
Simplified Back Office Architecture



a) Network Management System

While the cost of the Network Management System software is not included in the back-office, the development and integration costs are included in the back-office scope of work. The Network Management System is the gateway to all Edison SmartConnect™ meters and field infrastructure. As such, all commands sent to and all data received from the Edison SmartConnect™ meters and network field infrastructure must pass through the Network Management System. The Network Management System includes three subcomponents: the head-end component to communicate with the meters; the network management console to optimize and manage the individual meters and

1 network field infrastructure and how they work together; and the cryptographic services component to
2 secure the data and communications of the entire network.

3 The Network Operations Center is a physical place that includes the systems and
4 personnel to oversee the operations of the AMI telecommunications network. The Network Operations
5 Center views information about the status of the network; any events or alarms sent by devices attached
6 to the network; and the performance of the Edison SmartConnect™ network through the network
7 management system. For example, network operators may use the Network Management System to
8 optimize the performance of the network, perform and manage remote upgrades to network attached
9 devices and determine the severity and appropriate response to events observed while monitoring
10 network activity.

11 **b) [Meter Data Management System \(MDMS\)](#)**

12 The MDMS is the repository of the meter and event data from the Edison
13 SmartConnect™ meters. In addition, the MDMS provides all of the validation, editing and estimating
14 necessary to support customer usage calculation necessary to generate an accurate bill. As the system of
15 record for meter data, other systems that require meter data from the Edison SmartConnect™ system
16 will retrieve such data from the MDMS. This serves to insulate the rest of SCE's systems from the large
17 volumes of data collected from the Edison SmartConnect™ meter population.

18 Aside from meter reading and billing support functions, the MDMS also receives
19 and routes all messages from the meter population to the appropriate SCE systems. This includes the
20 alarms for meter failures, power outage, tamper events, demand response messages, service switch
21 operation and messages from associated HAN devices. The MDMS is able to generate work order
22 requests and route them accordingly. As referenced below, the MDMS also prepares and provides the
23 data for delivery to individual customers equipped with Edison SmartConnect™ meters; satisfies the
24 reporting and data needs for SCE related to load forecasting, revenue and usage reporting, load control
25 response, wholesale settlement usage aggregation, and usage data to support distribution planning and
26 operations.

1 SCE selected eMeter's software platform, EnergyIP™, which has three major
2 elements: 1) a MDMS that provides a meter data warehouse and processing such as Validation, Editing,
3 and Estimation (VEE), 2) an integration platform for linking a variety of meter data collection systems
4 to a variety of utility information systems, and 3) Business Process Management software specializing in
5 advanced metering implementation, operations, and maintenance. EnergyIP extension applications
6 enable interval data collection, complex billing, and Web presentment of detailed energy usage data.

7 c) Load Control Systems

8 The Load Control Systems are the management and control system to manage the
9 smart thermostat and other new dispatchable load resources. These systems are required to support the
10 new functionality offered by smart thermostats for grid reliability as well as for economic dispatch. The
11 existing system used to manage SCE's Air Conditioning Cycling Program (ACCP) cannot support
12 economic dispatch functionality or other more sophisticated demand response program features that are
13 envisioned. SCE anticipates conducting a competitive RFP for a new load management system. The
14 assumptions in this case are derived from the analysis completed during Phase I and Phase II as well as
15 prior and recent efforts by SCE to assess advanced load control functionality and related systems
16 requirements and cost estimates.

17 The new Edison SmartConnect™ meters have the capability to communicate with
18 customer-owned devices through the HAN. For customers that sign up for demand response programs
19 allowing SCE to control their devices (*i.e.*, thermostats, *etc.*), remotely during demand response events,
20 the Load Control Systems are responsible for dispatching the commands through the Edison
21 SmartConnect™ network to the devices that will ultimately respond. The communication is two-way
22 enabling acknowledgement of receipt of demand response commands by the device as well as customer
23 over-ride capabilities.

24 The Load Control Systems must be aware of the program in which the customer is
25 enrolled, must have information on the device that will respond to demand response messages and must
26 have the flexibility to organize customers into groups designed to optimize the response across the
27 distribution network. As such, information about the customer, their participation in demand response

1 programs and the configuration of their meters and devices must be received from the MDMS and
2 Network Management System. Because the MDMS must be aware of demand response events, the
3 Load Control Systems will send messages through the MDMS via the Network Management System to
4 the meters. Acknowledgement, customer over-ride messages and usage measurements collected during
5 the demand response event period shall similarly come back through the Network Management System
6 to the MDMS and then the Load Control systems.

7 SCE proposes to enhance the existing Load Management System used to support SCE's
8 existing ACCP demand response program. The existing system is a one-way system and must be
9 enhanced to support Edison SmartConnect™ enabled demand response programs. Specifically, all the
10 acknowledgement, device state (*i.e.*, is the device on or off, *etc.*), over-ride and device registration
11 information must be provided to the Load Control Systems to be able to assess the demand response
12 capacity available at any given time and enable effective grouping and management of customers on
13 demand response programs.

14 d) Billing Systems

15 The MDMS calculates a customer's usage based on the program or the rate on
16 which a customer takes service. In order to perform this task, the MDMS must have information about
17 the customer, the meter and the program in which the customer is enrolled. Hence, an interface is
18 required to synchronize the data between the MDMS and Billing systems. Once the MDMS calculates
19 the customer's usage, the data will be sent to the Billing system for the bill calculation and generation
20 process. Initially, the MDMS will integrate with SCE's current billing system. When the new SAP
21 billing system replaces the existing legacy system, currently planned for 2009,¹⁵ MDMS will be
22 integrated with that system. Beyond basic billing functions, additional integration to enable on-demand,
23 remote reading of Edison SmartConnect™ meters; operation of the individual customers' service
24 switches; and meter asset management and installation support will be required.

¹⁵ In the event of changes to the SAP deployment, it may be necessary to alternatively enhance the existing systems to support the Edison SmartConnect™ functionality.

1 e) Web Portal

2 The web portal will provide each customer the opportunity to view their own
3 usage data, collected by the Edison SmartConnect™ meters, through the internet via the sce.com
4 website. In order to accomplish this task, the MDMS system will process and send the customer's data
5 to a web portal for access to their meter data. The system may require some analytical preparation of the
6 data so the customer can use it as well as integration with web portal so the data may be displayed on a
7 web page at *sce.com*. The connection is secure so that customers only may view their own personalized
8 data. The implementation of this capability will span Release 1 and 2. In Release 1, it is envisioned that
9 the population of customers that have Edison SmartConnect™ meter will be able to view basic meter
10 read data via the web portal. Release 2 would include more robust functionality including sophisticated
11 analytics that would relate the usage data to the customer's program and bill. In subsequent releases
12 during deployment, SCE expects to further develop the customer portal with features that support
13 personalization and simplification of choice related to programs and services available.

14 **3. Integration**

15 The following describes the scope for integrating the Network Management System,
16 MDMS, and back office systems.

17 a) Integrating Network Management System and MDMS

18 The MDMS integrates with Network Management System to facilitate two way
19 communications between the meter at each customer's premise with our MDMS and billing systems.
20 The first step in integrating the Network Management System with the MDMS is to identify business
21 processes that are changed or enabled through the implementation of Edison SmartConnect™. These
22 business processes are designed and then analyzed to identify the data and commands necessary to
23 enable the new or changed business process. Individual interfaces are designed and developed to enable
24 the flow of data between these two systems. The volume of the data and frequency with which each
25 interface must run determines the software and hardware design and sizing necessary to support the
26 integration between the Network Management System and MDMS. The resulting infrastructure and

1 integration development activities are the primary cost drivers in the implementation and operation of
2 each system.

3 b) [Integrating MDMS with Billing Systems](#)

4 The MDMS integrates with the billing system to pass VEE usage data to the
5 billing system for the issuance of customer bills. Once the MDMS calculates the customer's usage, the
6 data will be sent to the Billing system for the bill calculation and generation process. Initially, the
7 MDMS will integrate with SCE's current billing system. When the new SAP billing system replaces the
8 existing legacy system, currently planned for third quarter 2009, MDMS will be integrated with that
9 system.

10 c) [Integrating MDMS with Web Portal](#)

11 The MDMS integrates with web portal to provide interval usage data for each
12 customer via the Internet. In order to accomplish this task, the MDMS system will process and send the
13 customer's data to a web portal to provide customer to access their meter data.

14 d) [Integrating MDMS with Outage Management System](#)

15 Integration between the MDMS and Outage Management System to support
16 Edison SmartConnect™ enables outage reporting and management processes. Outage messages will be
17 received through the Network Management System to the MDMS and passed to the Outage
18 Management System. The Outage Management System associates the meter with the distribution asset
19 relative to the particular meter. The hierarchy of relationships between distribution network assets (*i.e.*,
20 transformers) will be extended from the network bus currently in Outage Management System all the
21 way to the customer premise level. This will allow the Outage Management System to rapidly correlate
22 outage messages, received from Edison SmartConnect™ meters via MDMS to rapidly pinpoint where
23 the failure in the distribution network has occurred. In addition, the Outage Management System will
24 send planned outage information to the MDMS so that outage message volumes may be filtered and
25 managed across the Edison SmartConnect™ network. In the future, bringing together information
26 gathered from the Edison SmartConnect™ meter population about outage management together with

1 distribution automation data may provide the foundation for more advanced “Intelligent Grid”
2 applications.

3 e) Integrating MDMS with Other Systems

4 In addition to the integration activities described above, other SCE systems will
5 require integration with the MDMS. These systems include the following:

- 6 • MDMS to revenue protection systems for optimized tamper detection
7 processes. The Edison SmartConnect™ meters have the ability to send
8 tamper event messages to the MDMS which will then be passed onto the
9 revenue protection systems.
- 10 • After integration of the MDMS with Power Procurement Systems, the MDMS
11 will pass interval data sample sets to load forecasting systems to support more
12 accurate energy forecasting in support of Power Procurement processes.
- 13 • The capability to perform contract meter reading (gas/water meter reads via
14 Edison SmartConnect™) is possible. Should SCE provide contract meter
15 reading to another utility company, either the Network Management System
16 or the MDMS may need to integrate with the other utility company’s billing
17 systems.
- 18 • The Edison SmartConnect™ meters will have the capability to interface with
19 meters for plug-in hybrids through the HAN communication interface which
20 might allow for design of special plug-in hybrid programs. The MDMS
21 would need to be aware of the program the customer is participating in and the
22 customer’s vehicle information. This would require some additional
23 enhancements to the MDMS and surrounding interfaces.

24 f) Integrating MDMS with Load Control Systems

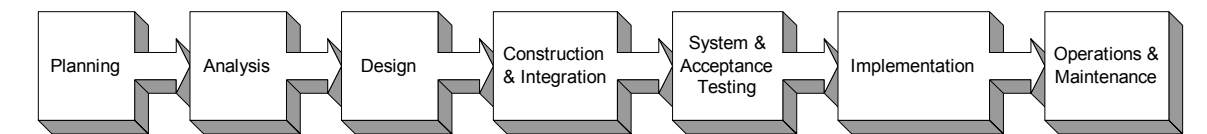
25 The Load Control systems are designed to support Edison SmartConnect™
26 enabled demand response programs across SCE’s control area. As such, the MDMS must be aware of
27 those customers who are on demand response rates, which demand response program each customer is

enrolled in, and when a demand response event has occurred. This will allow the MDMS to calculate the customer's usage and monitor their response to the event accordingly. In turn, the billing system, through the integration described above will receive the information necessary to accurately bill the customer according to the terms of the appropriate demand response program.

4. Development Method

The vast majority of the functions in the three releases are the result of software systems development. In order to successfully manage all of the activities associated with the three releases, SCE is using the highly successful System Development Life Cycle (SDLC) process. This is a standard and widely accepted software development process that is used to develop information systems by establishing business requirements, validations, training and user ownership. The SDLC model is shown in the figure below, which illustrates the entire development path from planning up through implementation and operations and maintenance.

Figure III-6
Software Development Life Cycle



Each of the key elements of the SDLC model is briefly described below:

- **Planning** – Establishes the business requirements and needs of the COTS software in accordance with Edison SmartConnect™'s functionality. The planning phase of the SDLC will:
 - Define the functional business requirements;
 - Identify the project's scope;
 - Develop the project plan; and
 - Manage and monitor the project plan.
- **Analysis** – A collaborative effort between the functional users and IT specialists to collect, comprehend, and logistically formalize business requirements. The analysis phase of the SDLC entails:

Gathering the business requirements;
Analyzing the business requirements; and
Prioritizing the business requirements;
Identifying architecture elements in the solution; and
Mapping requirements to architecture elements (systems, subsystems & components).

- **Design** – Creation of the technical blueprint. The design phase of the SDLC includes:

Defining or designing the Edison SmartConnect™ architecture and how it fits within SCE’s enterprise architecture; and

Designing the new back office systems model such as specifying graphical user interfaces, systems integration, screen designs, reports, databases and physical infrastructure.

- **Construction and Integration** – Execute the design into a physical system. This is achieved by:

Procuring the COTS packages; and

Integrating systems with each other, installing software on hardware within the data center,

Developing any enhancements or software necessary

- **System and Acceptance Testing** – Test the developed system to determine the new back office system’s functionality as planned and designed. Testing occurs in a separate, parallel environment which allows programmers to write conditions and test it before placing it into the live environment. Testing allows programmers to identify bugs and make any changes prior to implementation.
- **Implementation** – After system and acceptance test the system is placed into production and operated by the appropriate end-users. End-user training is conducted and the system is stabilized through a higher support level to resolve any issues in the first several weeks after “go-live.”
- **Operations and Maintenance** – Once the new back office system is implemented, IT will be responsible for maintaining the system by keeping it up to date with any

changes and ensuring the new back office system meets corporate goals. IT will achieve this augmenting its help desk to support the system users and implementing changes when necessary.

SCE recognizes that the implementation of Edison SmartConnect™ will introduce a significant change to both employees and customers. This change must be managed and planned well in advance of the first meter implementation and throughout the lifecycle of Edison SmartConnect™'s deployment. Successfully managing this change will minimize business disruption, enhance productivity, and accelerate the value of the Edison SmartConnect™ project.

5. Management of the Back Office Systems

To ensure successful development and implementation of back office systems, structured project management oversight and governance will be utilized. Processes and tools will be put in place to manage scope, schedule, budget, and resources consistent with the Project Management Institute's Project Management Body of Knowledge. Appropriate governance will also be put in place to manage issues identification, escalation, and resolution.

Additionally, SCE personnel must be prepared through training and education to operate and utilize the new systems during the Deployment Period.

6. Back Office Systems Risk Mitigation

There are various uncertainties and risks that may affect the integration and enhancements of the Network Management System and the MDMS and the billing legacy system, load management legacy system and other SCE legacy systems. SCE analyzed these risks including vendor and the integration and enhancements of the SCE legacy systems. Given the level of risk, it is appropriate to include a contingency in the Edison SmartConnect™ project cost estimates based on SCE's prior experience in software development integration and systems enhancement. The program's contingency estimate is further discussed in Chapter IV. Examples of risks and mitigation measures include:

1 a) Vendor Risk

2 SCE, in part, managed vendor risk by selecting a firm that has the capability,
3 financial standing and proven track record to support their technological expertise. SCE has selected
4 eMeter as the MDMS vendor due to: a) the application functionality, b) performance results in scale
5 testing conducted by IBM, at SCE's direction, in their New York labs, c) direct and relevant experience
6 implementing their MDMS software for large scale utility AMI systems. Since 1999, eMeter
7 Corporation of Redwood City, California, has provided software and services for electric, gas, and water
8 utilities with fixed network AMR systems. eMeter is one of the leading MDMS vendors with five
9 existing North American clients with AMI systems representing over 11 million smart meters (not
10 including SCE) as well as direct experience in the California market including the Statewide Pricing
11 Pilot. SCE has also engaged eMeter under contract terms and conditions that align eMeter's commercial
12 interests to those of SCE and its customers to help mitigate implementation risk.

13 b) Development and Integration Risk

14 The integration of the network management system and the MDMS to the billing
15 and other SCE legacy systems is highly complex and relies on the successful interaction of the required
16 hardware and the necessary software to allow the systems to properly function. A risk exists that the
17 integration between the systems or one or more of the legacy system enhancements may fail leading to a
18 substantial loss of functionality. SCE is managing development risk by employing a multi-release
19 approach to build foundational capabilities in Release 1 and then in subsequent releases add more
20 sophisticated functionality so as to ensure successful deployment of each release before embarking on
21 more complex functionality. SCE is also employing the software development lifecycle model that
22 relies heavily on the planning, analysis, design and system acceptance testing elements to develop
23 software that will integrate with several systems including SCE's billing system. In particular, SCE
24 relies on the testing element of the SDLC to mitigate potential risk. This testing is realized in the form
25 of individual unit testing (*e.g.* testing of individual system components or hardware), system acceptance
26 testing (*e.g.* full system testing) and continuous acceptance testing (testing as the full system scales up).
27 Each of the three releases utilizes the SDLC method to manage the development process. The

1 combination of multi-phase functional releases and the rigor of the SDLC process help to mitigate the
2 risk for a large complex AMI system.

3 SCE also engaged an experienced system integrator to manage the development
4 and integration of the network management system and MDMS. The purpose of the system integrator is
5 to augment SCE's information systems professionals with a team of consultants with direct and relevant
6 experience with AMI system development and complex system architecture. SCE selected IBM as the
7 system integrator in mid-2006. IBM's consulting services group has current experience at several large
8 AMI deployments representing over 25 million meters in North America including PG&E, Centerpoint,
9 IESO (Ontario ISO) and SCE. The lessons learned and best practices brought to the team by IBM have
10 been very valuable and continues to be a key resource for mitigating program risks.

11 Additionally, SCE employed favorable contract terms with its vendors to align
12 interests, deliverables, and risk sharing among the parties so that SCE and its customers can realize the
13 benefits of these systems.

14 **7. Estimated Costs for Implementation and Operation of New Back Office Systems**

15 Table III-7 shows the estimated O&M and capital costs during the Deployment Period
16 needed to implement and operate the new back office systems during the Deployment Period. These
17 estimated costs are comprised of four key functions: MDMS and integration with the Network
18 Management System; Back Office Enhancements; Load Control Systems; and Network Management
19 System integration deployment costs incurred in 2007. As shown in Table III-7, the MDMS
20 development and MDMS to Network Management System integration activities comprise about 54
21 percent of the total costs. About 72 percent of the estimated costs for the back office system upgrades
22 are capital expenditures to implement the changes to SCE's existing information technology
23 infrastructure and processes required to support Edison SmartConnect™. Within each of the three parts,
24 the costs drivers are primarily software licenses, hardware, and system integration (programming)
25 activities in addition to the labor required to for the initial implementation and ongoing operation. More
26 detailed discussion is provided in subsequent portions of this section.

Table III-7
Estimated Costs for Implementation of New Back Office Systems
(Millions of Nominal Dollars, Rounded)

Line No.	Description	O&M	Capital	Totals
1.	MDMS and Network Management System	21.7	90.7	112.4
2.	Back Office Enhancements	19.7	51.7	71.4
3.	Load Control Systems	0.0	7.4	7.4
4.	Totals	41.4	149.8	191.2

a) Cost Drivers for MDMS and Network Management System

The \$112.4 million forecast for this function is comprised of \$21.7 million in O&M expense and \$90.7 million in capital expenditure. The single largest activity in terms of cost is the integration of the Network Management System with the MDMS. As discussed earlier, because the Network Management System is bundled with the communication network equipment, the acquisition of the Network Management System software license is considered a part of the Acquisition of Meters and Communication Network Equipment program area. However, the integration costs of the Network Management System with the MDMS as well as the management of customer usage data are included in the Back Office Systems program area. The forecast capital expenditure includes the servers and disk space required for processing and storing 13 months of customer interval data. Because the Edison SmartConnect™ meter will collect hourly interval data from the customer, the Edison SmartConnect™ system will collect 120 million reads per day from the new meters. This is a major driver of infrastructure costs. For example, the back-office infrastructure required to support the MDMS alone may require in excess of 10 Terabytes of disk space. Additionally, this increase in customer data and infrastructure is implemented through labor required to install and integrate the MDMS infrastructure and the software that runs on it as well as the software and infrastructure supporting the MDMS integration with the Network Management System. The forecast O&M costs include both the labor to maintain the MDMS system itself as well as the maintenance labor to support system integration programming between the network management system and the MDMS.

1 b) Cost Drivers for Back Office Enhancements

2 Back office enhancements forecast costs are comprised of \$51.7 million in capital
3 expenditure and \$19.7 million in O&M expenses. The following describes the activities required to
4 integrate the MDMS with the different back office systems.

5 (1) Integrating MDMS with Billing Systems

6 SCE will integrate MDMS with the existing billing system in Release 1 in
7 2008 to support the start of full deployment in 2009. This activity includes implementing interfaces
8 between MDMS and the billing systems as well as changes to the billing systems themselves necessary
9 to generate accurate bills for customers with Edison SmartConnect™ meters; provide access to Edison
10 SmartConnect™ related data to users (such as call center or customer contact employees) across SCE;
11 enroll and manage customers in new Edison SmartConnect™ enabled programs; operate the service
12 switch; perform on-demand, remote meter reading; and manage meter asset and installation processes.

13 SCE is currently deploying an Enterprise Resource Planning (ERP) system
14 using SAP, a large enterprise application, with plans to replace financial, procurement, and other SCE
15 organizations' back office systems during 2008-2009 and existing billing system in the third quarter of
16 2009. Edison SmartConnect™ plans to integrate with the SAP billing system with Release 2 in the third
17 quarter of 2009. SCE plans to reduce significant program risks associated with concurrent development
18 of both systems and full scale deployment of meters through integrated process designs and a mitigation
19 strategy that involves maintaining the legacy billing system for an additional six months. This approach
20 mitigates significant systems development risks and avoid disruption to SCE's deployment schedule.
21 However, this mitigation strategy adds software development and maintenance expense for the legacy
22 system and SAP system design and development complexity for the additional six months.

23 (2) Integrating MDMS with Web Portal

24 This activity relates to the integration of the MDMS with the Web Portal
25 and enhancements to *sce.com* to provide customers access to data from their Edison SmartConnect™
26 meter through the internet via a web page on *sce.com*. The forecast capital expenditures include the
27 development and implementation labor to support Web Portal software enhancements; additional

hardware to support increased customer usage of *sce.com*; software and hardware to support MDMS analytical data preparation (*i.e.*, present the data to the customer in the context of the program they are enrolled in); and integration between the MDMS and the Web Portal. The forecast O&M expenses include labor necessary to maintain software and hardware for integration and within the MDMS and Web Portal to provide customers access to their meter data on-line.

(3) Integrating MDMS with Other Systems

This activity involves the activities necessary to integrate the MDMS with other SCE systems during Release 3 such as the outage management system. This function involves several activities. The first includes labor associated with integration, software enhancement and maintenance activities to support Edison SmartConnect™ enabled outage reporting and management processes. The second major activity in this function is labor associated with integration and software enhancement activities to support MDMS to revenue protection systems integration to optimize tamper detection processes. The third major activity in this function is integration and software enhancement activities needed to support more accurate energy forecasting for Power Procurement processes.

(4) End-to-end testing of New Back Office Systems

This function involves the end-to-end testing of SCE's new back office infrastructure and is an O&M expense. It includes labor to design and run the end-to-end tests to ensure Edison SmartConnect™ business process are supported and the systems and integrations developed during a particular release are ready for production operation.

c) Cost Drivers for Load Control Systems

The \$7.4 million in forecasted costs for this function is capital expenditure. These costs reflect significant upgrades to SCE's existing load control systems in addition to integrating the ability to remotely control the advanced meters through the MDMS. These changes will require redesign and implementation of load control processes and training for the load control operators. In addition, these costs include the maintenance of the new load control system during the Deployment Period.

d) Expected Annual Expenditures for Implementation of New Back Office Systems

Table III-8 shows the expected annual expenditures for the Implementation of New Back Office Systems by capital and O&M during the Deployment Period. The higher costs reflected in 2008 and 2009 reflect the higher amount of work required to prepare the back office systems for mass meter deployment scheduled to begin in 2009. The remaining years reflect the expansion of the implemented new systems required to accommodate the growth Edison SmartConnect™ program as meters are deployed as well as integration of the MDMS with SCE's new customer interface systems in 2009 and 2010.

Table III-8
Expected Annual Expenditures for Implementation of New Back Office Systems
(Millions of Nominal Dollars, Rounded)

Description	2007	2008	2009	2010	2011	2012	Totals
O&M	0.9	3.5	10.5	12.3	6.9	7.3	41.4
Capital	6.7	55.4	33.9	30.4	15.0	8.4	149.8
Totals	7.5	58.9	44.4	42.7	21.9	15.7	191.2

D. Customer Tariffs, Programs and Services

An essential part of SCE's advanced metering program implementation is the establishment of tariffs and programs that enable customers to benefit from Edison SmartConnect™. SCE's business case places a high priority on providing the means for customers to limit their electrical consumption during high-cost, on-peak periods and to take full advantage of lower off-peak pricing and direct load control incentives. This results not only in reduced customer energy costs, but also accounts for a major element of SCE's long-term cost reductions associated with avoided capacity and energy costs.

The objectives of the Customer Tariffs, Programs and Services function are to develop and implement the tariffs, programs and services during the Deployment Period to enable customers to benefit from the capabilities of Edison SmartConnect™. In addition, this section addresses the expected impacts to customer service operations required to support and externally communicate the deployment activities and delivery of the new tariffs, programs and services.

Exhibit SCE-4 provides a detailed discussion of the various tariffs and programs that SCE plans to offer as a result of Edison SmartConnect™. The related development work began nearly five years

ago and utilizes the Statewide Pricing Pilot (SPP) conducted in 2003 and 2004 to determine the price responsiveness of customers that would be enabled through an advanced metering program. SCE then followed a three-phase approach for deploying Edison SmartConnect™ and conducted customer tariff and program development activities. During Phase I, use cases identified potential customer programs or uses for the advanced meters. Ongoing work during pre-deployment includes design of the technical and business requirements for supporting the new tariffs and programs. As stated in Exhibit SCE-1, SCE is seeking authorization to implement a Programmable Communicating Thermostat (PCT) load control programs, and re-activate the CPP rate(s) used for the SPP in this application. SCE plans to seek rate design authorization for other demand response programs and new dynamic rates in its 2009 GRC Phase II filing.

1. Summary Descriptions of the Customer Tariffs, Programs and Services

Much of the work in this area will involve outreach to the customers to educate them on the new rates, programs and services enabled by Edison SmartConnect™ and how these offerings can help customers control their consumption, lower their on-peak usage and save on their electricity bills. In short, Customer Tariffs, Programs and Services includes dynamic rates and demand response programs. The following discussion summarizes the proposed programs which are further detailed in Exhibit SCE-4 supporting this Application.

a) Demand Response

(1) Load Control

Load control programs provide significant peak load reductions and power procurement benefits. An essential part of SCE's approach to load control is a PCT compatible with the anticipated Title 24 building code standard under development by the California Energy Commission (CEC) for implementation in 2009.

During deployment, SCE will continue to work with the CEC and other utilities to develop the PCT technology that is compatible with Title 24 and Edison SmartConnect™. SCE envisions leveraging the Title 24 PCTs installed by customers, as well as, providing customer rebates (up to \$125) for the purchase, installation of the Title 24 compliant PCTs and enrollment in an

1 SCE PCT program in lieu of air conditioning compressor switches used for the current Summer
2 Discount Plan (SDP). SCE will continue to work with thermostat vendors and other parties to accelerate
3 the design and testing of affordable PCTs. SCE will also examine potential tariff designs and system
4 requirements to enable pay-for-performance (such as by reduction event) rather than seasonal incentive
5 payments.

6 SCE requests that the Commission approve the PCT load control program
7 summarized in this section and detailed in Exhibit SCE-4 so that SCE may implement the associated
8 programs to support Title 24 in a timely manner.

9 (2) Peak Time Rebate

10 In its 2009 GRC Phase II application, SCE will request authority to
11 implement a PTR program for all residential customers. SCE's proposed PTR program is similar to the
12 program approved by the Commission for SDG&E's AMI deployment.¹⁶ The PTR will be an "overlay"
13 to the existing dynamic rates, TOU, or tiered rates, compatible with AB-1X, and will provide for credits
14 for usage reductions during peak periods of PTR event days.

15 Under the PTR program, all residential customers with an Edison
16 SmartConnect™ meter will automatically be eligible to participate in each PTR event. SCE may call up
17 to 15 PTR events per year during the peak hours of 2 p.m. to 6 p.m., excluding weekends and holidays.
18 Residential customers will be notified of a day-ahead PTR event through multiple channels which may
19 include public service announcements, partnerships with "Flex Your Power" notifications, welcome
20 greeting through SCE's call center and personal voice and text messages for those customers who
21 request it. SCE assumes a PTR incentive of \$0.66/kWh for reducing electricity usage during a PTR
22 event.¹⁷ There is no penalty for not reducing usage during a PTR event. SCE provides a more detailed
23 discussion of the PTR program in Exhibit SCE-4.

¹⁶ See D.07-04-043.

¹⁷ SCE plans to request approval of the PTR program and incentives in Phase II of its 2009 GRC.

1 SCE plans to begin offering PTR to residential customers in the fall of
2 2009, subject to GRC Phase II approval, as meters are installed. In this Application, SCE is seeking
3 recovery of estimated incremental costs associated with PTR implementation during the Deployment
4 Period. SCE expects to incur incremental costs during the Deployment Period to market and outreach to
5 customers and educate them on the PTR program, and to administer the program.

6 (3) Dynamic Rates

7 TOU and CPP rates and the PTR program will provide significant peak
8 load reductions. SCE has existing opt-in TOU and CPP rates for residential and Commercial and
9 Industrial (C&I) customers under 200 kW. TOU and CPP rates will be offered to all residential and
10 small commercial customer 0-19kW as their advanced meters are installed starting in 2009.
11 Commercial customers with load 20-200kW will be defaulted to a new TOU, but may opt-out. Once the
12 PTR program is authorized in SCE's 2009 GRC Phase II, residential customers will be automatically
13 placed on the PTR program once they receive their Edison SmartConnect™ meter. SCE provides a
14 more detailed discussion of these dynamic rates in Exhibit SCE-4.

15 SCE does not request approval of these modified rates in this application.
16 Pending a decision approving the modified rates in Phase II of the 2009 GRC (expected in October
17 2009), SCE plans to offer its existing, voluntary TOU and CPP rates to residential and C&I customers
18 under 200 kW as Edison SmartConnect™ meters are rolled out in 2009.

19 SCE does seek recovery in this application of the estimated incremental
20 costs associated with the TOU and CPP rate offerings for residential and C&I customers under 200 kW
21 during the Deployment Period. SCE estimates that it will incur incremental costs during the
22 Deployment Period to market and outreach to customers and educate them about the existing and
23 modified and new dynamic rates. SCE also expects to incur incremental administration costs associated
24 with the dynamic rate offerings for residential and C&I customers under 200 kW during the Deployment
25 Period.

2. Demand Response Program Development and Administration

Administration of new demand response programs enabled by Edison SmartConnect™ will involve program management activities related to development and implementation, customer enrollment, peak period customer notification, reporting and analyzing program results, and the processing of customer rebates and incentives. Each of these activities is discussed in the following sections.

a) Development and Implementation New Demand Response Programs

The development and implementation of a new price response or load control program is the responsibility of a program management organization charged with the development of a project plan specifying the schedule and scope of each program. Most new demand response programs require the collaborative efforts of a program design team made up of program management, market research, rate design, regulatory and legal resources, all dedicated to each of the individual programs as they evolve. This effort also includes coordination of program requirements with operational areas including Billing, Call Center and IT. The program development phase includes obtaining regulatory authorization for any related tariffs and or rule changes to accommodate each proposed program.

b) Customer Enrollment

As discussed in Section III.D.3 below, the customer enrollment phase usually includes the use of marketing resources to implement the appropriate level and mix of mass media and direct marketing to encourage optimum levels of enrollment of the targeted customer population. Administrative activities include monitoring program status, customer participation rates and the performance of support organizations.

c) Customer Notifications

As discussed in Section III.D.3.c below, several of the new Edison SmartConnect™ enabled programs will require direct notification of participating customers when critical peak periods are anticipated. For example SCE's proposed PTR program requires that participating customers be notified of a PTR event a day-ahead through multiple channels. CPP rates have similar customer notification requirements.

1 d) Reporting and Analyzing New Programs

2 Analyzing and reporting results of SCE's new programs are essential components
3 of optimizing the value of SCE's demand Response Portfolio of programs and services. Monitoring
4 customer attitudes and response to each individual program by conducting direct market research among
5 participants and combining those results with actual metered data response obtained through the Edison
6 SmartConnect™ system will provide a definitive assessment of each programs success or failure.

7 e) Processing Rebates and Rate Incentives

8 Assuring proper application of customer rebates and incentives is critical to the
9 success of any program. The processes and systems needed to validate that all incentives are properly
10 applied in a timely manner is an essential part of Program Management oversight.

11 **3. Outreach and Marketing Communications**

12 Helping customers make informed decisions that will benefit them and create the
13 adoption of new tariffs, programs and services that support public policies is a key objective of Edison
14 SmartConnect™. SCE operates in a very unique market place. Not only are there over 40 languages
15 spoken in Southern California, but SCE operates in the second most expensive media market in the
16 nation. Covering 50,000 square miles of territory populated by 13 million diverse residents naturally
17 requires the use of multiple media channels and multiple sources within each channel.

18 a) Market Segmentation and Targeted Bundles

19 Not only are SCE's customers demographically diverse, but they also exhibit
20 different attitudes toward electricity. As a result of its research, SCE currently segments its residential
21 market into six personas. Each of these personas possesses unique traits in regards to their attitude
22 towards energy, how they like to conduct business with SCE, and lifestyles. SCE plans to continuously
23 monitor the effectiveness of its market segmentation and adjust the dividing lines as necessary over
24 time.

25 Overall, SCE's marketing strategy is to provide simple and widely available
26 communications containing intuitive and easy to understand information about the new tariffs, programs
27 and services. These outreach efforts will be complemented with simplified enrollment procedures that

1 are easy to use by customers. The initial stage of marketing new tariffs, programs and services will
2 target customer groups based on the meter installation plan. Beginning in 2009, concurrent with the
3 initiation of meter installations, SCE plans to undertake a significant and sustained marketing and
4 outreach campaign regarding the new rates, programs, services available to customers as they receive
5 their new meters. Throughout the Deployment Period and thereafter, SCE plans to continuously monitor
6 customer behavior and adjust its marketing tactics as necessary to continue meeting public policy
7 objectives and accommodate changing customer behaviors over time.

8 SCE will use the customer personas to design specific bundles of offerings to help
9 drive adoption of the new tariffs, programs and services. Anchored by the appropriate Edison
10 SmartConnect™ enabled rate(s), each bundle will be deliberately designed to help a specific customer
11 group manage and conserve energy. During the Deployment Period, each customer will receive an
12 Edison SmartConnect™ welcome package. This package will provide customers information about the
13 various rates, load control programs, and services available to them as a result of receiving a new meter.
14 The package will include a variety of materials such as fact sheets.

15 In addition to the initial outreach, SCE plans to provide ongoing communication
16 to retain or expand customer participation. During and after the Deployment Period, SCE plans to a)
17 modify its outreach and marketing campaigns to expand participation and b) provide the services
18 required to retain customers. SCE will also develop services and tools for customers to manage their
19 energy usage. Similar to the tools currently available to its large business customers, SCE plans to offer
20 tools, mostly through the Internet, to residential and small/medium business customers that provide the
21 level of information and functionality customers need to manage their usage and make decisions.

22 b) Provisioning Customer Information and Home Area Network

23 One of the six functional criterion specified by the Commission¹⁸ for advanced
24 metering is the availability of customer information as it is an important enabler of demand response.
25 Access to electricity usage and cost information on a daily basis empowers customers to understand

¹⁸ The six functional criterion specified by the Commission in R.02-06-001 are addressed in Section III.E of Exhibit SCE-1 of the testimony supporting this application.

1 their costs by time of day and by usage behaviors. Customer information generally improves response
2 to demand response tariffs and programs and encourages energy conservation. Edison SmartConnect™
3 enabled tariffs and programs will be an important component of SCE's customer web portal, where
4 customers will have access to information and have the ability to execute a wide range of inquiries and
5 transactions. Customer access to energy information is one of the core tenets of Edison SmartConnect™
6 and with about 25 percent of SCE's customers without internet access, this HAN interface and some
7 type of in-home energy display which will enable all customers to access to their usage which will
8 empower them to make smart choices. The HAN interface capability has been incorporated into the
9 leading vendors products based on market demand. For example, the Texas Public Utilities Commission
10 incorporated the HAN interface into its smart meter rules. Smart meters with this capability are being
11 deployed as part of SCE's Field Tests, as well as in Texas, Canada, Australia and other parts of the
12 world.

13 c) Marketing and Customer Education Strategy

14 During the installation phase, SCE expects to notify customers of planned meter
15 changes through direct mailings. Any mass media or other outbound communications that the
16 Commission may direct SCE to use for purposes of public notification during the installation phase
17 would add incrementally to SCE's estimated costs.

18 Beginning in 2009, concurrent with the initiation of Edison SmartConnect™
19 meter installations, SCE plans to undertake a significant and sustained marketing and outreach campaign
20 regarding the new rates, programs, services available to customers as they receive their new meters. The
21 strategic approach of the campaign is to use an integrated mix of media designed to maximize the
22 customer opt-in for dynamic rate options and customer participation in demand response programs,
23 retain customers on the TOU and/or CPP rates over time, and affect a long-term cultural and behavioral
24 change for the purpose of maximizing demand reduction from all customers. The campaign must be
25 multi-year in order to positively affect long-term change.

(1) Campaign Overview

Given the scope of the Edison SmartConnect™ effort, SCE needs to develop and implement an integrated, multi-layered, multi-year campaign that will explore new approaches for communicating relevant information on multiple, complex programs, in a manner that will help customers understand and enroll into the programs. The campaign will leverage existing efforts, as well as new opportunities. The primary marketing vehicles will be:

- Mass media will be used to generate awareness of the Peak Time Rebate (PTR). Since customers are automatically enrolled in this program, mass media will serve as an effective mechanism to reach SCE's diverse customer base with information about the program.
- Direct customer communications will be utilized throughout the life of the program. SCE expects to develop and implement a comprehensive enrollment and educational campaign to persuade customers to take advantage of new rates and programs and then help them modify behavior to maximize their demand reduction. SCE also plans to develop and implement a direct-communications retention campaign to maintain the customer base over time.

(2) Communications Media

During the course of the campaign, the weight and mix of media and direct communications as well as the overall cost will change to reflect the communications support required. To make outreach as effective as possible, SCE conducted research with SCE's customers to help us understand consumer attitudes and adapt messaging appropriately. Using this research, SCE developed an on-going campaign that includes communication and outreach that is designed to optimize the messaging to SCE's diverse customer base. SCE intends to saturate the customer base with a broad-based awareness and educational campaign, as well as specifics on how customers can respond to time-differentiated rates. The media mix SCE envisions for the campaign includes mass media, targeted/ethnic media, direct communications, and PTR and CPP event notification.

1 (a) Mass Media

2 Use of mass media will extend to cable television, print and online
3 advertising to support general and event awareness to residential customers for the PTR program. For
4 example, for the general English-speaking market, SCE envisions that cable television, print, and online
5 advertising would run over a 3 to 4 month period of time, during the summer, when PTR events are
6 likely to occur.

7 (b) Targeted/Ethnic Media

8 Use of ethnic media will extend to print, radio, and online
9 advertising. Such targeted media channels will also leverage strategic partnerships (ethnic business
10 chamber promotion) to reach SCE's diverse customer base. In-language media will emphasize
11 education and awareness of the Peak Time Rebate program for eligible residential customers. For
12 example, SCE envisions radio, and printed information to run on approximately the same time schedule
13 as the general (English) market. The ethnic media will target Hispanic, Asian (Chinese, Korean,
14 Vietnamese), and African American customers.

15 (c) Direct Communications

16 Use of direct communications will include bill inserts, direct mail,
17 e-mail notification, voice mail notification, shared mail, newsletters, and face-to-face communication
18 through outreach events and the account management function. Direct communications will be used
19 throughout the entire life-cycle of the effort to communicate with customers. Messages will range from
20 generating awareness, education and participation to retention. For example, messages used for
21 retention and behavior change education are expected to help customers maximize demand reduction.
22 Specifically, SCE envisions utilizing a variety of direct customer communication tactics staged over a
23 designated period of time to maximize reaching SCE's customers and the frequency with which they
24 hear SCE's education and retention messages, thus, driving behavior change.

25 (d) PTR Event Notification

26 SCE expects to notify customers of a PTR event through multiple
27 channels which may include public service announcements, partnerships with "Flex Your Power"

1 notifications, welcome greeting through SCE's call center and personal voice and text messages for
2 those customers who request it.

3 (e) CPP Event Notification

4 SCE expects to use an automated phone messaging system to send
5 voice and text messages and potentially press releases/press relations to notify customers of CPP days.

6 d) Campaign Goals and Objectives

7 The Edison SmartConnect™ media campaign will differ significantly from those
8 previously undertaken by SCE. Previous campaigns were designed to create customer awareness and
9 promote programs on a short-term basis. This campaign will use educational information and tools to
10 help customers make the behavioral changes required to take advantage of dynamic rates and demand
11 response programs. The purpose of this campaign is to maximize demand reduction from participating
12 customers, as well as create retention information designed to retain customers on these rates over time.
13 Long-term customer enrollment and long-term behavioral and cultural change are essential to Edison
14 SmartConnect™'s success. One of the two main objectives of the campaign is to teach customers about
15 why dynamic rates require behavioral changes and move them toward such behavioral changes.
16 Through education, SCE expects to achieve customer understanding of their energy usage and offer
17 them information and tools to manage their usage under these pricing options. This will be achieved
18 through the customer-specific education portions of the campaign. The campaign's other main objective
19 is to maximize the customer opt-in rate and retain customers on the dynamic rates over time. This will
20 be accomplished through the customer-specific retention portion of the campaign.

21 The cost of this type of campaign is significantly affected by SCE's unique
22 Southern California location as it relates to mass and in-language media costs (PTR program awareness
23 only). Our service territory sits in some of the most expensive advertising costs/media outlets in the
24 United States. The greater Los Angeles area, including Climatic Zone 4 communities, is the second
25 largest and highest cost media market in the country. It is also both linguistically and culturally

1 diverse.¹⁹ As such, messages must be created and delivered in languages other than English.
2 Additionally, 35 percent of SCE's customer base has demonstrated a lack of interest in electricity issues
3 other than when their power goes out.²⁰ Customer communications must break through this
4 demonstrated low level of interest and be accomplished through a variety of linguistically and culturally
5 appropriate approaches to properly address various Asian, Spanish-speaking, and African-American
6 communities, as well as the general population. Our forecasted average, yearly, media and advertising
7 costs related to customer communications and education for the Demand Response scenarios are close in
8 comparison to media and advertising costs for other utilities (such as telecommunications utilities) in the
9 Los Angeles Designated Market Area.²¹

10 e) Program Development Life Cycle

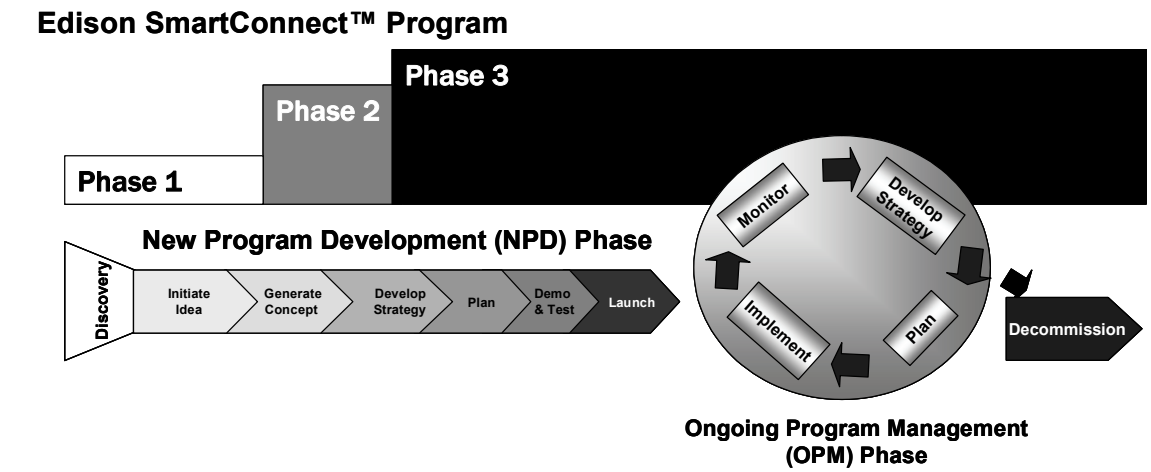
11 Designing effective marketing campaigns for such a diverse customer base
12 requires extensive market research, analysis and planning. Combining the company's experience with
13 industry best practices, SCE employs a proven approach for developing customer products and services.
14 As shown below, developing and managing new programs and services can be divided into two periods
15 -- New Program Development (NPD) and Ongoing Program Management (OPM).

¹⁹ 2003–2004 Nielson Universe Estimates, DMA Ranking and Advertising Age Magazine, July 24, 2000.

²⁰ ARD0075 Residential Segmentation: Southern California Edison Customer Segmentation Research, December 2003.

²¹ 2004, Nielson Media Research.

Figure III-7
Edison SmartConnect™ Product Development Life Cycle



(1) New Program Development

New Program Development began in Phase I and is expected to continue through the first portion of deployment for current portfolio of new tariffs, programs and services enabled by Edison SmartConnect™. Activities prior to launch are intensive research composed of the following steps:

- Initiate Idea – identification of conceptual customer tariffs, programs and services and preliminary customer surveys regarding the concept of advanced metering.
- Evaluate Concept – investigation of high-level technical and market unknowns to clarify scope, limitations, impacts and the overall feasibility of the project, including preliminary financial assessment.
- Develop Strategy – extensive market and customer analyses accompanied by more detailed financial assessment to determine the reasonableness and cost effectiveness require for ‘go, no go’ decision.

- Create Program Plan – detailed implementation planning for all aspects including: demo and testing, scope, marketing channel strategy, issues and operational impacts.
- Demo and Test – execution of demo and test with sample set of customers and associated program refinements based on customer feedback.
- Launch Program – implementation of final plan.

(2) Ongoing Program Management

Once a program is implemented, SCE actively monitors the adoption, retention, and customer satisfaction as necessary to determine what adjustments must be made, including decommissioning. Similar to the development portion of the program life cycle, SCE employs proven standards of practice, summarized by the following:

- Monitor Program – performance tracking of the program’s planned goals, such as enrollment, retention and customer satisfaction in order to provide valuable feedback required by the program managers if program changes are warranted.
- Develop/Refine Strategy – if warranted based on monitoring activities, a reassessment of program strategy to better align with new market conditions, including identification of new program initiatives or enhancements.
- Update Program Plan – development of the necessary revisions to program plan based on refinement strategy for enhancing the program.
- Launch Enhanced Program – implementation of improved program plan and begin the maintenance process for the enhanced program.
- Decommission – programs determined to be ineffective based on a variety of reasons will be decommissioned.

4. Estimated Costs of Customer Tariffs, Programs and Services

Table III-9 shows the estimated O&M and capital costs needed to deliver advanced customer tariffs, programs and services enabled by Edison SmartConnect™. These estimated costs are comprised of two functions: Demand Response Development and Administration, and Marketing and Customer Communications. As shown in Table III-9, 100 percent of the estimated total \$112.1 million is O&M expense. As described earlier in this section, the primary purpose of this entire deployment area is to implement the required changes to SCE's existing operations to develop, market and deliver value added services available through an advanced metering infrastructure. A more detailed discussion about each function is in subsequent parts of this section.

Table III-9
Estimated Costs for Customer Tariffs, Programs and Services
(Millions of Nominal Dollars, Rounded)

Line No.	Description	O&M	Capital	Totals
1.	Marketing & Customer Communications	70.2	0.0	70.2
2.	Demand Response Development and Administration	41.9	0.0	41.9
3.	Totals	112.1	0.0	112.1

a) Cost Drivers for Outreach and Market Communications

SCE forecasts \$70.2 million in O&M expenses for outreach and market communications activities during the Deployment Period. The marketing activities for Edison SmartConnect™ involve two primary activities: (a) initial outreach and (b) communication about the program and marketing of the new tariffs, programs and services. Both of these activities require market research, campaign planning, marketing and advertising content development, and ongoing market management.

The initial outreach activities about Edison SmartConnect™ are included in the estimated costs. In addition, the estimated costs for this activity include educating customers about the Edison SmartConnect™ program, and communicating the purpose of the program and a high-level deployment plan in a timely and effective manner. Continuous market research will also be conducted to gage the effectiveness of SCE's outreach and educating campaigns so that SCE may improve its

1 outreach efforts for this activity as necessary. Furthermore, this activity includes the initial welcome
2 notification to customer as meters are installed.

3 Among the new offerings, PCT and PTR are expected to require the most
4 marketing as these are new programs that leverage new technology that was not previously available to
5 SCE customers. As discussed earlier, the opt-in TOU tariff for residential customers is an existing tariff
6 offering that will require significant marketing expense to educate customers about potential costs
7 saving that can be achieved through energy consumption behavior. This educational process is
8 comprised of customer tariff education and customer energy usage and energy informational tools (e.g.,
9 internet access to energy usage and cost). The marketing of the tariff offerings such as CPP and TOU
10 for small and medium commercial customers is included in this area, as well as, the estimated costs for
11 development and management of web-enabled tools and communications. These costs include labor and
12 non-labor costs to develop, implement and provide ongoing management of the new web-based energy
13 information tools, customer educational material development/print and customer support to address
14 customer navigational and energy information related questions.

15 b) Cost Drivers for Demand Response Development and Administration

16 The \$41.9 million in forecasted O&M expense for development and
17 administration of new demand response offerings is comprised of two primary activities: PCT rebates
18 and program management. This is based on providing a rebate of up to \$125 to each eligible customer
19 that has purchased and installed an Edison SmartConnect™/Title 24 compliant PCT and enrolls in
20 SCE's PCT program which will be Title 24 compliant. The estimated O&M expense is primarily for
21 labor related to the program management of the new offerings. This includes development of customer
22 enrollment policies and procedures, implementation of new policies and procedures, and execution and
23 ongoing management of the new programs.

24 c) Expected Annual Expenditures for Customer Tariffs, Programs and Services

25 Table III-10 shows the annual expenditures for Customer Tariffs, Programs and
26 Services is purely O&M expenses. The O&M expense is driven by SCE's mass meter installation plan,
27 which begins in 2008 and concludes in 2012.

Table III-10
Expected Annual Expenditures for Customer, Tariffs, Programs and Services
(Millions of Nominal Dollars, Rounded)

Line No.	Description	2007	2008	2009	2010	2011	2012	Totals
1.	O&M	0.0	5.5	17.0	21.6	32.6	35.5	112.1
2.	Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3.	Totals	0.0	5.5	17.0	21.6	32.6	35.5	112.1

E. Customer Service Operations

A significant portion of SCE's deployment costs will result from the impact deployment activities will have on SCE's existing customer service operations. The two most significantly impacted customer service operational areas will be billing services and the call centers. Both these areas are expected to incur incremental costs during the Deployment Period and a summary of these impacts are discussed in the following subsections. Further discussion of the ongoing customer service operation impacts from Edison SmartConnect™ is contained in Exhibit SCE-3, where post-deployment impacts are discussed as part of the cost benefit analysis for the entire program.

1. Billing Services

Billing Operations will be affected by a significant increase in manual exceptions processing resulting from usage validation issues expected during the Deployment Period. There will also be an increase in the number of energy theft cases identified during the meter installation process, which will have to be resolved by the billing organization.

Billing Services will perform three types of Revenue Protection activity during deployment based on tip cards that are received from the field: (1) processing tips – identifying energy theft or billing errors, putting this information in a database, and determining the need to rebill; (2) rebilling customers where warranted; and (3) performing collections activities on those customers who are rebilled. The Revenue Protection process will be initiated through the detection and analysis of unusual usage patterns by analysts using the back office systems (MDMS). Other billing and collection activities are expected to remain the same. Quality assurance checks on new rates, ad hoc requests from customers to help them analyze and understand the new tariffs and program options, and

inquiries related to marketing initiatives utilizing customer bill statements will also impact the billing organization.

2. Call Center

On-going call volume related to routine service connections, credit issues and service interruptions will continue in a “business-as-usual” manner while additional call volume will result from customer inquiries related to meter installations, access to usage data, new customer tariff options such as the Peak Time Rebate program, Critical Peak Pricing (CPP) and Time of Use (TOU) rate options. The call center will also need to conduct specialized training necessary to prepare customer service representatives to respond to the complex issues accompanying the new metering capabilities. The call center will also undergo some procedural changes related to customer turn-on and turn-off orders and connect and disconnect orders, which will now be handled from the call center due to the remote connect and disconnect capabilities of the new meters.

3. Estimated Costs for Customer Service Operations

Table III-11 forecast \$84.1 million in costs for this category. This is comprised of \$78.9 million in O&M expense and \$5.2 million in capital expenditures. For Edison SmartConnect™, there are two key activities that make up customer service operations: Billing Services and Call Center. SCE expects to expand its existing operational areas to support these activities as a result of the new tariffs, programs and services enabled by Edison SmartConnect™.

Table III-11
Estimated Costs for Customer Service Operations
(Millions of Nominal Dollars, Rounded)

Line No.	Description	O&M	Capital	Totals
1.	Billing Services	55.2	0.0	55.2
2.	Call Center	23.7	5.2	28.9
3.	Totals	78.9	5.2	84.1

a) Cost Drivers for Billing Services

Billing Services are forecasted to require \$55.2 million in O&M expense. SCE expects to incur additional O&M expense related to quality assurance checks of new tariff offerings enabled by Edison SmartConnect™. SCE also expects an increase in customer inquiries about their bill

1 due to these new tariff offerings. Implementation of Edison SmartConnect™ will require process
2 improvement support activities in how bills are processed. Planned activities include: 1) documenting
3 related billing business processes, 2) implementing necessary process changes so that they are integrated
4 across all billing operational groups to support deployment, and 3) developing and implementing new
5 requirements to address billing and revenue reporting system changes for Edison SmartConnect™
6 programs and tariffs in accordance with regulatory requirements. As customers receive new meters,
7 SCE expects to experience increased manual exceptions processing as the billing system high or low
8 read validations are changed.

9 As previously discussed in Section B of this Chapter, SCE expects to uncover
10 potential energy theft cases during meter installations which will require incremental O&M expenses as
11 well in SCE's revenue services operations to help validate and resolve these cases. These costs are
12 reflected in SCE's forecasted O&M for billing services.

13 b) Cost Drivers for Call Center

14 Call center costs are forecasted to be \$23.7 million in O&M expense and \$5.2 in
15 capital expenditure. The primary driver of these costs is the expected increase in customer call volume
16 during the Deployment Period. Not only does SCE expect customers to contact the Call Center in
17 regards to installation activities, but also expects significant increases in call volume due to customer
18 inquiries about the new tariffs, programs and services. Customers will have many new options available
19 to them and will want additional detailed information prior to making a decision. Some inquiries will be
20 fulfilled by information on the SCE website, however, the majority of the detailed inquiries is expected
21 to be handled by the call center.

22 c) Expected Annual Expenditures for Customer Service Operations

23 Table III-12 shows the annual capital and O&M expenditures for Customer
24 Service Operations. The O&M expense is driven by SCE's mass meter installation plan, which begins
25 in 2008 and concludes in 2012. The capital expenditures are for facility improvements required to
26 accommodate the additional resources required to respond to the increase in call center activity.

Table III-12
Expected Annual Expenditures for Customer Service Operations
(Millions of Nominal Dollars, Rounded)

Line No.	Description	2007	2008	2009	2010	2011	2012	Totals
1.	O&M	0.0	4.2	16.1	20.2	20.9	17.4	78.9
2.	Capital	0.0	0.9	4.3	0.0	0.0	0.0	5.2
3.	Totals	0.0	5.1	20.5	20.2	20.9	17.4	84.1

Some benefits will start to accrue during the Deployment Period as well. These include avoided capital costs of no longer needing to purchase electromechanical meters for customer growth or to replace failed existing meters during the Deployment Period, and the avoided cost of new customer meter sets that otherwise would have occurred. Similarly, avoided labor costs will begin accruing as early as 2009 resulting from the elimination of routine meter reading routes, the introduction of the automatic connect/disconnect capabilities of the Edison SmartConnect™ system, and the ability to obtain on-demand meter reads, thus eliminating the need for “pick-up” reads.

Further discussion of the ongoing customer service operation impacts from Edison SmartConnect™ is contained in Volume 3, where SCE details the post-deployment impacts as part of the cost benefit analysis for the entire program.

F. Overall Program Management

The success of the Edison SmartConnect™ program is highly dependent on the coordinated execution of all the interrelated functional areas responsible for deployment activities. It is standard practice for large and complex projects such as Edison SmartConnect™ to be governed through a program management office (PMO) to provide the proper level of management oversight for the entire project. SCE has established a PMO to manage the project to meet the defined scope, schedule and budget for deployment and operational activities during the Deployment Period. SCE is using industry best practices related to overall project management and technology specific management techniques. The PMO is made up of a team of experienced SCE project managers and contracted project management experts. The PMO function will remain in-tact through the deployment phase and into the post-deployment operational phase as the project closes out and becomes operational.

1 The PMO is responsible for overall program integration, program execution of scope, schedule,
2 budget, performance monitoring and reporting, contract administration, program and financial controls,
3 benefits realization and corporate and regulatory compliance. The PMO also provides the overall
4 program governance structure and framework to ensure timely and effective decision making, risk
5 management and issues resolution. The PMO is accountable for effective communication among
6 external and internal stakeholders to help them achieve an understanding of the Edison SmartConnect™
7 program to facilitate the program objectives throughout the Deployment Period.

8 In summary the PMO will utilize best practices for activities that can be grouped into the
9 following functions. The PMO staff is organized in a similar structure.

- 10 • Project Management - management of overall program scope, schedule, budget and resources
11 consistent with the Project Management Institute's Project Management Body of Knowledge.
12 This effort includes management of related risks through the ongoing identification and
13 resolution of execution issues during the Deployment Period.
- 14 • Financial Controls – this includes prudent support of the fiscal controls required to manage
15 the deployment costs within the Commission's final decision, and complying with SCE's
16 corporate financial policies including adherence to Sarbanes-Oxley.
- 17 • Contract administration – this includes activities to manage the payment of services and
18 products consistent with the negotiated terms and conditions based on the performance
19 and/or deliverables of the respective vendors.
- 20 • Regulatory support and compliance – this includes activities required to support the litigation
21 process for this application, compliance requirement resulting from the Commission's final
22 decision, and compliance with SCE's corporate governance protocols.
- 23 • Communications – a program with the scale and complexity as Edison SmartConnect™
24 requires the coordinated action of a very large number of personnel both SCE resources as
25 well as contract.

26 At the peak of deployment in 2009 through 2012, this program will have about 700 people
27 incrementally engaged full-time on the program. This number will be augmented by more than 300

people that are engaged on a part-time basis. Communications are an essential element of the management strategy to keep the organization aligned to the objectives and focused on the deployment tasks. Additionally, a major risk mitigation strategy is to maintain strong industry working relationship to share lessons learned and best practices to increase SCE's overall effectiveness.

1. Program Management Organization Objectives

PMO objectives are to keep the program on target, on time, and on budget. Included within the PMO responsibilities is the Edison SmartConnect™ business plan development, which includes a thorough and on-going financial assessment of the cost-effectiveness of the program and the internal management approvals and external regulatory approvals necessary to keep the program progressing forward. This also includes management of the project contingency which involves continuous monitoring of actual expenditures, forecasts and variance analyses to determine program progress and the degree to which contingency may be required to satisfy legitimate changes in scope, schedule, budget and/or resources. More detailed discussion of how the project contingency was estimated is provided in Chapter IV of this exhibit.

2. Estimated Costs for Project Management During Deployment

Table III-13 shows the estimated O&M and capital costs for overall program management during the Deployment Period. As shown, SCE estimates \$45.6 million for PMO activities. The program management area will help manage interrelationships between the different deployment areas in addition to maintaining consistency and cost-effectiveness for the program's general and administrative activities. A more detailed discussion about each function is in subsequent portions of this section.

Table III-13
Estimated Costs for Overall Program Management
(Millions of Nominal Dollars, Rounded)

Line No.	Description	O&M	Capital	Totals
1.	Program Management Functions	37.5	8.1	45.6
2.	Totals	37.5	8.1	45.6

a) Cost Driver for Program Management Labor

The program management costs include \$37.5 million in O&M expenses and this accounts for 82 percent of the total PMO costs. To maintain effectiveness, the PMO team is comprised of multiple disciplines including finance, regulatory, and project management.

The PMO cost estimate also includes non-labor expenses required to support the non-field Edison SmartConnect™ project team personnel, which will be as high as 155 people during the Deployment Period. PMO cost estimates for this larger team include expenses like facilities, travel and other personnel-related expenses required to support these resources.

b) Expected Annual Expenditures for Overall Program Management

Table III-14 shows the annual expenditures for Program Management during the Deployment Period. The capital costs during the beginning of the Deployment Period are related to the installation and setup of facilities, primarily office space. The O&M expense is greater during the earlier years as SCE ramps up, however it does reflect that the program management resources required to be maintained throughout the Deployment Period.

Table III-14
Expected Annual Expenditures for Overall Program Management
(Millions of Nominal Dollars, Rounded)

Description	2007	2008	2009	2010	2011	2012	Totals
O&M	0.0	9.1	8.4	7.3	6.5	6.2	37.5
Capital	0.0	7.7	0.0	0.0	0.0	0.3	8.1
Totals	0.0	16.8	8.4	7.4	6.5	6.5	45.6

IV.

CONTINGENCY

The cost estimates for the Edison SmartConnect™ project contain uncertainty due to various risks associated with a project of this nature and magnitude. New technologies enabling the metering and communication systems and the pioneering nature of the new products and services SCE plans to offer in concert with its full scale meter deployment program, require that a comprehensive risk assessment be included with the cost estimates associated with certain key elements of the program. As part of SCE's risk mitigation strategy, contingencies have been included with SCE's cost and benefit estimates in order to help quantify this element of risk. Some of the key areas where contingency is required to mitigate execution risks include:

- Price differences that occur between the RFP, contracted terms and the ultimate final vendor payments (as discussed in Chapter III, part A.4);
- Back office systems cost variances due to uncertainties related to data processing, storage requirements, varying levels of vendor warranties and support, and the difference between expected and actual system integration efforts (as discussed in Chapter III, part C.5);
- Uncertainties related to the number of billing exceptions processed (as discussed in Chapter III, part E); and
- Risks related to the management and implementation of the field deployment, and realization of deployment-related benefits on schedule (as discussed in Chapter III, part B.4 and Chapter V).

SCE applied a widely adopted Monte Carlo statistical approach to create a probabilistic range around its cost estimates. This approach utilizes high-low ranges for each cost and benefit estimate, to create a probability distribution for the likely overall cost of the SmartConnect deployment. Each estimate can take on values up to the "high" range, or down to the "low" range, which is expressed as a percentage. For example, a cost of \$100, which is estimated to range between +30% and -20%, would take on a value of between \$130 and \$80 in the Monte Carlo analysis. The software assigns these values

randomly to each cost estimate, and produces a probability distribution for the overall SmartConnect model.

Using a not-to-exceed confidence level of 90 percent, SCE estimates a statistically reasonable contingency of \$147.3 million for the Deployment Period. SCE believes this provision for contingencies is an essential aspect of SCE's business case. Provision for such contingencies is a widely accepted standard practice in project management and cost estimating as defined by both PMI and American Association of Cost Engineers. The Commission has already recognized the relevance of contingency to the AMI projects and established a precedent of including similar provisions for contingencies with both PG&E's and SDG&E's AMI programs.²² Thus, SCE believes it is reasonable and prudent to provide for similar contingency in its meter deployment project as well.

SCE's contingency estimates are shown in Table IV-15 for each of the deployment years.

Table IV-15
Estimated Contingency
(Millions of Nominal Dollars, Rounded)

Description	2008	2009	2010	2011	2012	Totals	Present Value
O&M	3.2	6.3	7.6	8.3	7.6	33.0	(24.2)
Capital	9.8	28.7	32.1	30.3	13.3	114.3	(85.8)
Totals	13.0	35.0	39.8	38.7	20.9	147.3	(110.0)

SCE proposes to post actual incremental SmartConnect costs to the balancing account, and to post forecast benefits on a per-meter, per-month basis as meters are installed and activated. SCE is subject to forecast risk on both the costs of the deployment, as well as the initial benefits to be realized from SmartConnect during the Deployment Period. The contingency analysis reflects the increased uncertainty due to the relatively early stage of technology adoption. It is reasonable to permit SCE to utilize its project contingency for any unanticipated SmartConnect deployment costs, whether those arise from increases in estimated costs, or from unanticipated delays in realizing benefits from the meter deployment.

²² See D.06-07-027 at p. 12; also D.07-04-043.

V.

DEPLOYMENT PERIOD COSTS AND BENEFITS

SCE's proposed deployment costs and the cost recovery mechanism presented in Volume 5 (SCE-5) of this Application include the costs and benefits expected to be incurred during the Deployment Period.²³ Costs incurred prior to 2008 have already been authorized in prior proceedings and are currently being recovered through the Advanced Metering Infrastructure Balancing Account. Costs and benefits to be incurred after 2012 (post deployment) are considered to be on-going operating costs and will be recovered through future GRC proceedings. Edison SmartConnect™ costs have been isolated into these timeframes for ratemaking and cost recovery purposes.²⁴

The majority of the deployment costs are direct Edison SmartConnect™ program-related costs incurred in completing the activities described in the previous Chapters of this volume. Besides these program related deployment costs, Edison SmartConnect™ is expected to impose dramatic impacts on SCE's existing customer service operations. The most significantly impacted customer service operational areas will be the call centers, the billing organization and the training functions. These operational areas will be doing significant amounts of additional work resulting from the deployment stage of Edison SmartConnect™ (*i.e.*, 2008 through 2012). In addition to normal operations, call volume and billing exception processing are expected to increase as customers begin to receive their new meters and begin to utilize the new SmartConnect programs and services.

While the deployment activities will present some operational challenges and added costs in some areas, some benefits will start to accrue during the Deployment Period as well. Most obvious among the early benefits to be derived from the Edison SmartConnect™ program are the avoided capital costs of no longer needing to replace failed existing meters during the Deployment Period, and the avoided cost of installing an interval data recording (IDR) meter when a customer requests a time-of-use

²³ This Application also requests authorization to transfer certain "deployment" costs proposed in this Application but incurred in 2007 and recorded in SCE's AMI Memorandum Account to the Edison SmartConnect Balancing Account upon a final decision in this proceeding, as contemplated in D.07-07-042, SCE's Phase II Decision.

²⁴ SCE's Business Case for Edison SmartConnect™ is based on a net present value of all costs and benefits to be realized over the entire life of the project. This analysis is the subject of Volume 3 (SCE-3) of this Application.

1 rate that otherwise would have occurred. Similarly, avoided labor costs will begin accruing as early as
2 2009 resulting from the elimination of routine meter reading routes, the ability to obtain on-demand
3 meter reads thus eliminating the need for “pick-up” reads, and finally the introduction of the remote
4 connect/disconnect capabilities of the Edison SmartConnect™ system.

5 A critical part of this Application for approval to proceed with full deployment of the Edison
6 SmartConnect™ system is the cost recovery mechanism being proposed.²⁵ Because SCE’s 2009 GRC
7 Application will be heard by the Commission concurrently with this Application, SCE has proposed a
8 simple resolution of the potential for either double counting of costs or the counter-part issue of possibly
9 leaving something out. In its 2009 GRC,²⁶ SCE has developed its Test Year 2009 costs based on a
10 “business-as-usual” approach to customer service operations. That is to say, the Edison
11 SmartConnect™ program and its impact on operating costs were not considered for purposes of
12 developing the 2009 GRC Test Year forecast. This isolates the consideration of incremental costs and
13 benefits derived from Edison SmartConnect™ for the years 2009 through 2012 directly within the scope
14 of this proceeding. In its 2012 GRC Application, SCE expects to treat Edison SmartConnect™ costs
15 and benefits in the opposite manner, including them in its “business-as-usual” cost estimates for the
16 2012 Test Year, and will reconcile costs and benefits derived in 2012 and beyond at that time.

17 SCE also expects to obtain some demand response benefits during the Deployment Period in the
18 form of avoided capacity and energy costs.

19 The costs for the Edison SmartConnect™ project over the Deployment Period are estimated at
20 \$1.7 billion. As this is a capital intensive project, SCE forecasts \$1.3 billion in capital expenditures over
21 the Deployment Period. These capital expenditures represent 75 percent of the total estimated
22 deployment costs. As will be shown in Volume 5 (SCE-5) of this Application, though these costs are

²⁵ SCE’s proposed cost recovery mechanism for the Edison SmartConnect™ program is the subject of Volume 5 (SCE-5) of this Application.

²⁶ See SCE Notice of Intent to file a 2009 Test Year GRC tendered with the Division of Ratepayer Advocates on July 23, 2007.

incurred during the Deployment Period the impact of these capital costs on the ratepayer will be spread over the capital recovery period, which extends over the full duration of the project.

Table V-16 is a nominal dollar summary of the estimated costs and benefits expected to be incurred by program area during the Deployment Period. Because the majority of SmartConnect costs relate to the initial meter and infrastructure deployment they are heavily loaded to the front-end of the project, while the benefits are realized over the entire duration of the program. Exhibit SCE-3 will present the net present value of these costs and expenses over the 26 year life of the program and will show the impact of these estimates on the rate payer by converting the nominal dollar amounts to a Present Value of Revenue Requirement (PVRR). As will be discussed in Exhibit SCE-3, SCE's final business case for Edison SmartConnect™ is approximately \$109 million positive on a PVRR basis.

Table V-16 shows the Deployment Period costs and benefits in nominal dollar values.

Table V-16
Program Benefit and Cost Analysis – Deployment Period Only
(Millions of Nominal Dollars, Rounded)

Line No.	Description	O&M	Capital	Totals
1.	Costs			
2.	Acquisition of Meters and Communication Network Equipment	1.6	836.5	838.0
3.	Installation of Meters and Communication Network Equipment	79.6	216.9	296.6
4.	Implementation and Operation of New Back Office Systems	41.4	149.8	191.2
5.	Customer Tariffs, Programs and Services Costs	112.1	0.0	112.1
6.	Customer Service Operations	78.9	5.2	84.1
7.	Overall Program Management	37.5	8.1	45.6
8.	Contingency	33.0	114.3	147.3
9.	Costs Totals	384.2	1,330.7	1,714.9
10.	Benefits			
11.	Operational	188.4	89.9	278.2
12.	Demand Response	144.4	71.8	216.2
13.	Benefits Totals	332.8	161.6	494.4

Table V-17 illustrates the expected annual Edison SmartConnect™ project costs and benefits by year for the deployment period.

Table V-17
Estimated Deployment Costs and Benefits by Year
(Millions of Nominal Dollars, Rounded)

Description	2007	2008	2009	2010	2011	2012	Totals
Costs							
O&M	1.4	37.0	72.9	88.5	96.6	87.9	384.2
Capital	6.7	114.0	332.2	372.2	351.3	154.2	1,330.7
Annual Costs	8.0	151.0	405.1	460.7	447.9	242.1	1,714.9
Benefits							
O&M	0.0	1.2	12.6	55.6	108.2	155.1	332.8
Capital	0.0	4.7	22.2	26.0	38.3	70.5	161.6
Annual Benefits	0.0	5.9	34.8	81.6	146.5	225.6	494.4

A. Operational Benefits During the Deployment Period

Over the life of the project, SCE expects 63 percent of project costs to be offset by operational benefits. Operational benefits are defined as the benefits expected to result strictly as a result of changes in SCE's operations and do not include customer demand response benefits.²⁷ The majority of these impacts, in particular the benefits, is not expected to fully materialize until after full deployment of Edison SmartConnect™. However, SCE does expect to begin realizing certain operational benefits during the Deployment Period which are discussed in detail by Exhibit SCE-3. During the Deployment Period, the functionalities of Edison SmartConnect™ are expected to provide a number of benefits in the following operational areas: Meter Services Organization; Customer Service Operations; Transmission & Distribution; and Back Office Systems.

As shown in Table V-18, these estimated operational benefits are forecast to be \$188.4 million in O&M savings and \$89.9 million in avoided capital expenditures during the Deployment Period. SCE expects its Meter Services Organization to experience 74 percent of the expected operational benefits during the Deployment Period. The cost drivers for each of these benefit areas are detailed in Exhibit SCE-5.

²⁷ It should be noted, however, that the project costs used in this calculation include the Customer Tariffs, Programs and Services costs that enable the customer demand response.

Table V-18
Estimated Operational Benefits During Deployment Period
(Millions of Nominal Dollars, Rounded)

Line No.	Description	O&M	Capital	Totals
1.	Meter Services	169.7	88.8	258.5
2.	Customer Service Operations	12.2	0.0	12.2
3.	Back Office Systems	1.6	1.1	2.7
4.	Transmission and Distribution	4.8	0.0	4.8
5.	Totals	188.4	89.9	278.2

Table V-19 shows the expected annual operational benefits during the Deployment Period. About 54 percent of these benefits are expected to be O&M related. In addition, SCE expects to realize the benefits to increase as meters are deployed, starting from \$5.9 million in 2009 and growing to \$108.6 million in 2012.

Table V-19
Expected Annual Operational Benefits During Deployment Period
(Millions of Nominal Dollars, Rounded)

Line No.	Description	2007	2008	2009	2010	2011	2012	Totals
1.	O&M	0.0	1.2	8.2	29.0	60.7	89.3	188.4
2.	Capital	0.0	4.7	22.2	26.0	17.7	19.3	89.9
3.	Totals	0.0	5.9	30.3	54.9	78.4	108.6	278.2

B. Demand Response Benefits During the Deployment Period

A primary aspect of the State's energy policy objectives is optimizing the use of demand response to help ratepayers control energy costs and provide favorable societal benefits, such as the reduction of green house gases. In support of these objectives and SCE's own corporate goals, SCE plans to offer Edison SmartConnect™ enabled tariffs, programs and services as soon as SCE initiates mass meter deployment. A summary of these programs is provided in Chapter III of this Exhibit, where SCE also provides the forecast costs for developing, marketing and administering these programs during the Deployment Period. A detailed description of these programs is provided in Exhibit SCE-4.

The benefits of demand response are major contributors to SCE's economic analysis of Edison SmartConnect™ detailed in Exhibit SCE-3. The benefit drivers for demand response are primarily the technical assumptions for customer enrollment, program participation, and elasticity, which are all

described in Exhibit SCE-4. The benefit is the assumed cost of avoided capacity and energy costs. Table V-20 shows that the demand response benefits expected to occur during the deployment period is forecast to be \$216.2 million in avoided capacity and energy costs.

Table V-20
Expected Annual Demand Response Benefits During Deployment Period
(Millions of Nominal Dollars, Rounded)

Line No.	Description	2007	2008	2009	2010	2011	2012	Totals
1.	O&M	0.0	0.0	4.4	26.6	47.5	65.8	144.4
2.	Capital	0.0	0.0	0.0	0.0	20.6	51.2	71.8
3.	Totals	0.0	0.0	4.4	26.6	68.1	117.0	216.2

Appendix A
Witness Qualifications

1 **SOUTHERN CALIFORNIA EDISON COMPANY**
2 **QUALIFICATIONS AND PREPARED TESTIMONY**
3 **OF LISA D. CAGNOLATTI**

4 Q. Please state your name and business address for the record.

5 A. My name is Lisa D. Cagnolatti, and my business address is 2244 Walnut Grove Avenue,
6 Rosemead, California 91770.

7 Q. Briefly describe your present responsibilities at the Southern California Edison Company.

8 A. I am the Director of the Customer Communications Organization

9 Q. Briefly describe your educational and professional background.

10 A. I hold a Bachelor's degree in Chemical Engineering from UCLA and an MBA from Pepperdine
11 University. I have over 20 years of experience in the utility industry including positions of
12 increasing responsibility in Marketing, Environmental Affairs, Regulatory Affairs, Transmission
13 and Distribution, and Customer Services.

14 Q. What is the purpose of your testimony in this proceeding?

15 A. The purpose of my testimony in this proceeding is to sponsor the portions of this Exhibit SCE-2
16 as identified in the Table of Contents herein.

17 Q. Was this material prepared by you or under your supervision?

18 A. Yes, it was.

19 Q. Insofar as this material is factual in nature, do you believe it to be correct?

20 A. Yes, I do.

21 Q. Insofar as this material is in the nature of opinion or judgment, does it represent your best
22 judgment?

23 A. Yes, it does.

24 Q. Does this conclude your qualifications and prepared testimony?

25 A. Yes, it does.

SOUTHERN CALIFORNIA EDISON COMPANY
QUALIFICATIONS AND PREPARED TESTIMONY
OF PAULA M. CAMPBELL

Q. Please state your name and business address for the record.

A. My name is Paula M. Campbell, and my business address is 2131 Walnut Grove Avenue, Rosemead, California 91770.

Q. Briefly describe your present responsibilities at the Southern California Edison Company.

A. I am currently leading the Program Management Office for the Advanced Metering Infrastructure (AMI) Program at Southern California Edison (SCE). In this role, I am responsible for overall program integration, program execution of scope, schedule, budget, performance monitoring and reporting, contract administration, and program and financial controls. My direct and matrixed staff includes SCE managers, project managers, subject matter experts, and external consultants.

Q. Briefly describe your educational and professional background.

A. I am currently taking coursework to complete my Bachelor of Science Degree in Business Administration from the University of Phoenix. I have also completed periodic executive education programs at Columbia University and University of Chicago with an upcoming Wharton Executive Development program at the University of Pennsylvania scheduled for September 2007. I am also a certified Human Resource Generalist with the Society for Human Resource Management. I began my career at Southern California Edison in the Customer Service Business Unit in October of 1990. In 1992, I transitioned to Information Technology to work on the development of the Customer Service System (CSS). I was promoted to project manager in 1994 supporting a variety of projects and programs in Customer Service Business Unit. I became a Manager in 1998 responsible for the residential segment of the call center operations, including 13 supervisors and 220 customer service representatives. In 2004, I was promoted to my current position.

1 Q. What is the purpose of your testimony in this proceeding?

2 A. The purpose of my testimony in this proceeding is to sponsor portions of this Exhibit SCE-2 as
3 identified in the Table of Contents herein.

4 Q. Was this material prepared by you or under your supervision?

5 A. Yes, it was.

6 Q. Insofar as this material is factual in nature, do you believe it to be correct?

7 A. Yes, I do.

8 Q. Insofar as this material is in the nature of opinion or judgment, does it represent your best
9 judgment?

10 A. Yes, it does.

11 Q. Does this conclude your qualifications and prepared testimony?

12 A. Yes, it does.

SOUTHERN CALIFORNIA EDISON COMPANY
QUALIFICATIONS AND PREPARED TESTIMONY
OF PAUL J. DE MARTINI

Q. Please state your name and business address for the record.

A. My name is Paul J. De Martini, and my business address is 2244 Walnut Grove Avenue, Rosemead, California 91770.

Q. Briefly describe your present responsibilities at the Southern California Edison Company.

A. I am the Edison SmartConnect™ Program Director. I am responsible for managing all aspects of the AMI program feasibility, system design, development, and deployment efforts.

Q. Briefly describe your educational and professional background.

A. I hold a Master of Business Administration (M.B.A) degree from the University of Southern California and a Bachelor of Science (B.S.) degree in Applied Economics from the University of San Francisco. I also completed Certificates in Project Management from the University of California, Berkeley and Technology Management from the California Institute of Technology. I have been at Southern California Edison for about five years during which I was the IT Project Manager on AMI beginning in 2004, prior to assuming the overall program management responsibility in 2005. Relevant positions prior to joining Southern California Edison included Vice President of the Energy Strategy practice at ICF International in 2000-2002 with a focus on demand response, advanced metering and distributed generation technologies. I began my career at PG&E Corporation in both regulated and unregulated businesses for nearly twenty years. I held positions at the utility with increasing responsibility involving electric systems operations, T&D project management, and wholesale power procurement and ultimately at the unregulated subsidiary PG&E Energy Services as Vice President, Integrated Services.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony in this proceeding is to sponsor portions of this Exhibit SCE-2 as identified in the Table of Contents herein.

1 Q. Was this material prepared by you or under your supervision?
2 A. Yes, it was.
3 Q. Insofar as this material is factual in nature, do you believe it to be correct?
4 A. Yes, I do.
5 Q. Insofar as this material is in the nature of opinion or judgment, does it represent your best
6 judgment?
7 A. Yes, it does.
8 Q. Does this conclude your qualifications and prepared testimony?
9 A. Yes, it does.

SOUTHERN CALIFORNIA EDISON COMPANY
QUALIFICATIONS AND PREPARED TESTIMONY
OF JAMES F. GREGORY

Q. Please state your name and business address for the record.

A. My name is James F. Gregory, and my business address is 2244 Walnut Grove Avenue, Rosemead, California 91770.

Q. Briefly describe your present responsibilities at the Southern California Edison Company.

A. I am the Edison SmartConnect™ Field Deployment Manager. I am responsible for managing all aspects of the field installation of all Edison SmartConnect™ meters whether installed by Contractor or SCE resources.

Q. Briefly describe your educational and professional background.

A. I hold a Master of Business Administration (M.B.A.) degree from Loyola College in Baltimore, Maryland and a Bachelor of Science (B.S.) degree in Mechanical Engineering from the University of Maryland. I have been at Southern California Edison for less than 1 year. Relevant positions prior to joining Southern California Edison included Manager – Electric Construction & Maintenance at Lee County Electric Cooperative in Southwest Florida in 2004-2007 with a focus on executing field construction and maintenance activities utilizing contractor and company resources performing electric substation, transmission, and distribution work. Prior to that I was Vice President – Operations at Central Locating Service (A wholly owned subsidiary of Asplundh) in 2000 – 2004 with a focus on managing an international underground utility locating contracting organization with over 2000 employees and annual revenue over \$100M/yr. Earlier, I was Director – Contract Administration & Resource Management and Director - Capital Construction in the Distribution Division for Baltimore Gas & Electric between 1995-2000 with a focus on business process re-engineering, utility contracting/procurement, resource planning, gas & electric distribution construction, and commercial metering installation.

1 Q. What is the purpose of your testimony in this proceeding?

2 A. The purpose of my testimony in this proceeding is to sponsor the portions of this Exhibit SCE-2
3 as identified in the Table of Contents herein.

4 Q. Was this material prepared by you or under your supervision?

5 A. Yes, it was.

6 Q. Insofar as this material is factual in nature, do you believe it to be correct?

7 A. Yes, I do.

8 Q. Insofar as this material is in the nature of opinion or judgment, does it represent your best
9 judgment?

10 A. Yes, it does.

11 Q. Does this conclude your qualifications and prepared testimony?

12 A. Yes, it does.

SOUTHERN CALIFORNIA EDISON COMPANY
QUALIFICATIONS AND PREPARED TESTIMONY
OF ERIC S. HELM

Q. Please state your name and business address for the record.

A. My name is Eric S. Helm, and my business address is 2244 Walnut Grove Avenue, Rosemead, California 91770.

Q. Briefly describe your present responsibilities at the Southern California Edison Company.

A. As Manager of Financial Planning and Analysis for the Customer Service Business Unit, I am currently responsible for financial modeling, project analysis, and product and service pricing for major projects within the business unit.

Q. Briefly describe your educational and professional background.

A. I hold a Bachelor of Arts degree in Economics from Claremont McKenna College, and an MBA with a Finance concentration from California State University at Long Beach. I joined Edison's Residential Energy Management staff in 1983, working on residential rebate and home energy survey programs. I held analyst positions in the Revenue Requirements department from 1987-89, and analyst and management positions in SCE's Treasurer's department from 1989-1996, primarily in the Investor Relations group. I have managed the CSBU Financial Planning function since 1996. I have previously testified before this Commission.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony in this proceeding is to sponsor the portions of this Exhibit SCE-2 as identified in the Table of Contents herein.

Q. Was this material prepared by you or under your supervision?

A. Yes, it was.

Q. Insofar as this material is factual in nature, do you believe it to be correct?

A. Yes, I do.

1 Q. Insofar as this material is in the nature of opinion or judgment, does it represent your best
2 judgment?

3 A. Yes, it does.

4 Q. Does this conclude your qualifications and prepared testimony?

5 A. Yes, it does.

SOUTHERN CALIFORNIA EDISON COMPANY
QUALIFICATIONS AND PREPARED TESTIMONY
OF CHARLIE C. HU

Q. Please state your name and business address for the record.

A. My name is Charlie Hu, and my business address is 2244 Walnut Grove Avenue, Rosemead, California 91770.

Q. Briefly describe your present responsibilities at the Southern California Edison Company.

A. I am currently leading the Business Design effort for Edison SmartConnect™ Program at Southern California Edison. In this role, I am accountable for all back office activities needed to support Edison SmartConnect™. The back office activities include designing and implementing the business processes and information technologies needed to support Edison SmartConnect™. My direct and matrixed staffs include SCE project managers, subject matter experts, external consultants, and vendors.

Q. Briefly describe your educational and professional background.

A. I hold a Bachelor of Science (B.S.) degree in Computer Science from California State University of Los Angeles. I also completed the Management Program from Columbia University Graduate School of Business and various graduate classes from Pepperdine University. I have been in Southern California Edison for over seventeen years. I was in the Information Technology organization the first seven years where I held positions with increasing responsibility involving system development and implementation of our current billing system. The last ten years include leadership roles involving implementation of various major process improvement initiatives in the Customer Service organization with focus in the areas of customer service, metering, meter reading, field services, billing, and revenue collections.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony in this proceeding is to sponsor the portions of Exhibit SCE-2 as identified in the Table of Contents herein.

1 Q. Was this material prepared by you or under your supervision?
2 A. Yes, it was.
3 Q. Insofar as this material is factual in nature, do you believe it to be correct?
4 A. Yes, I do.
5 Q. Insofar as this material is in the nature of opinion or judgment, does it represent your best
6 judgment?
7 A. Yes, it does.
8 Q. Does this conclude your qualifications and prepared testimony?
9 A. Yes, it does.

SOUTHERN CALIFORNIA EDISON COMPANY
QUALIFICATIONS AND PREPARED TESTIMONY
OF SETH KINER

Q. Please state your name and business address for the record.

A. My name is Seth J. Kiner, and my business address is 2244 Walnut Grove Avenue, Rosemead, California 91770.

Q. Briefly describe your present responsibilities at the Southern California Edison Company.

A. I am the Director of Customer Experience Management, in the Customer Service Business Unit, at Southern California Edison. I have responsibility for the development and implementation of customer communication and outreach efforts (collaborating with various parts of SCE) to all classes of customers, enhancement of delivery channels such as *sce.com* to meet customers' preferences, customer satisfaction management and employee communication within the Customer Service Business Unit.

Q. Briefly describe your educational and professional background.

A. I received a Bachelor of Science degree in Business Administration, with a major in Marketing, from Arizona State University in 1983. I have over 21 years of management experience leading marketing, product management and communications efforts to reach diverse audiences, working in a variety of industries including: utility, not-for-profit, financial services and telecommunications. My three most immediate positions prior to SCE were: Director of Marketing, KPMG, LLC; Vice President of Marketing, United Way of Greater Los Angeles; and Director of Marketing and Marketing Communications, Transamerica Life Companies.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony in this proceeding is to sponsor the portions of this Exhibit SCE-2 as identified in the Table of Contents herein.

Q. Was this material prepared by you or under your supervision?

A. Yes, it was.

1 Q. Insofar as this material is factual in nature, do you believe it to be correct?

2 A. Yes, I do.

3 Q. Insofar as this material is in the nature of opinion or judgment, does it represent your best
4 judgment?

5 A. Yes, it does.

6 Q. Does this conclude your qualifications and prepared testimony?

7 A. Yes, it does.

SOUTHERN CALIFORNIA EDISON COMPANY
QUALIFICATIONS AND PREPARED TESTIMONY
OF LAWRENCE M. OLIVA

Q. Please state your name and business address for the record.

A. My name is Lawrence M. Oliva, and my business address is 2244 Walnut Grove Avenue, Rosemead, California 91770.

Q. Briefly describe your present responsibilities at the Southern California Edison Company.

A. I am a Director in SCE's Customer Services Business Unit and I lead a group entitled Tariff, Programs and Services. This group is responsible for SCE's Demand Response programs.

Q. Briefly describe your educational and professional background.

A. I earned a Bachelor of Science Degree in Civil Engineering from Southern Methodist University in 1972. Prior to joining SCE as an employee this year, I was a business consultant in the energy industry for over 30 years. I was a principal and director of an international economics consulting firm, Putnam, Hayes and Bartlett, Inc., and a business consulting partner of Arthur Andersen. In past four years, I provided consulting services to SCE in the areas of demand response and advanced metering.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony in this proceeding is to sponsor the portions of this Exhibit SCE-2 as identified in the Table of Contents herein.

Q. Was this material prepared by you or under your supervision?

A. Yes, it was.

Q. Insofar as this material is factual in nature, do you believe it to be correct?

A. Yes, I do.

Q. Insofar as this material is in the nature of opinion or judgment, does it represent your best judgment?

A. Yes, it does.

1 Q. Does this conclude your qualifications and prepared testimony?

2 A. Yes, it does.