



AMI Program Phase I

*Putting Customers in the Driver's Seat:
Accelerating Advanced Metering*

**Program Update
San Francisco**

November 30, 2006

AMI Program Objectives

Empower customers to manage their energy costs and provide new services through smart technology

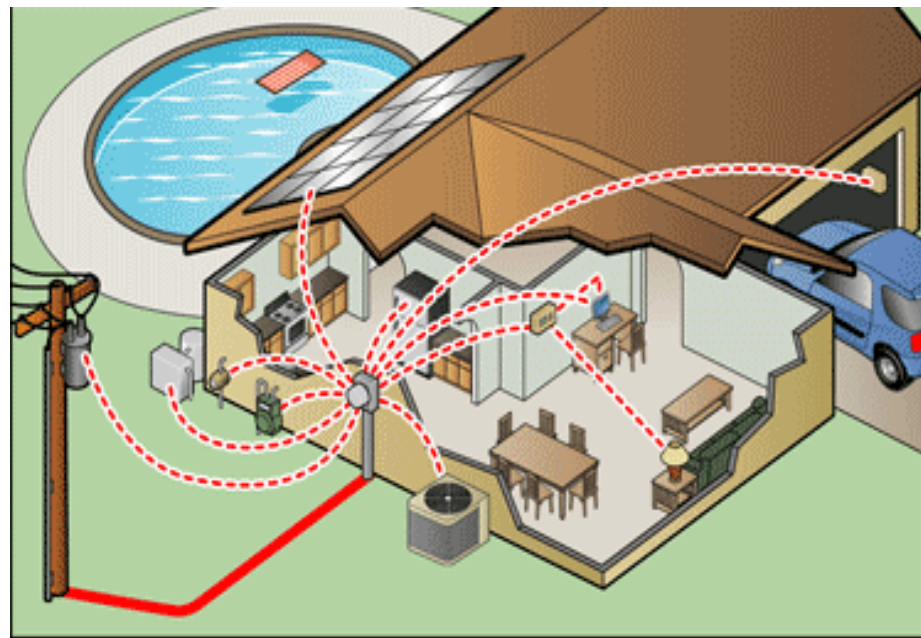
- Create lasting customer value through cost effective advanced metering technology solutions
- Design to support Federal and State Energy Policy Objectives
- Supporting SCE's strategy of modernizing our infrastructure with smart technologies toward an intelligent grid
- Provide a catalyst for industry innovation toward next generation technology based on added functionality and open - flexible solutions to extend functional life

Smart Connections with our Customers

2006 North American AMI Project of the Year UPN-AMRA

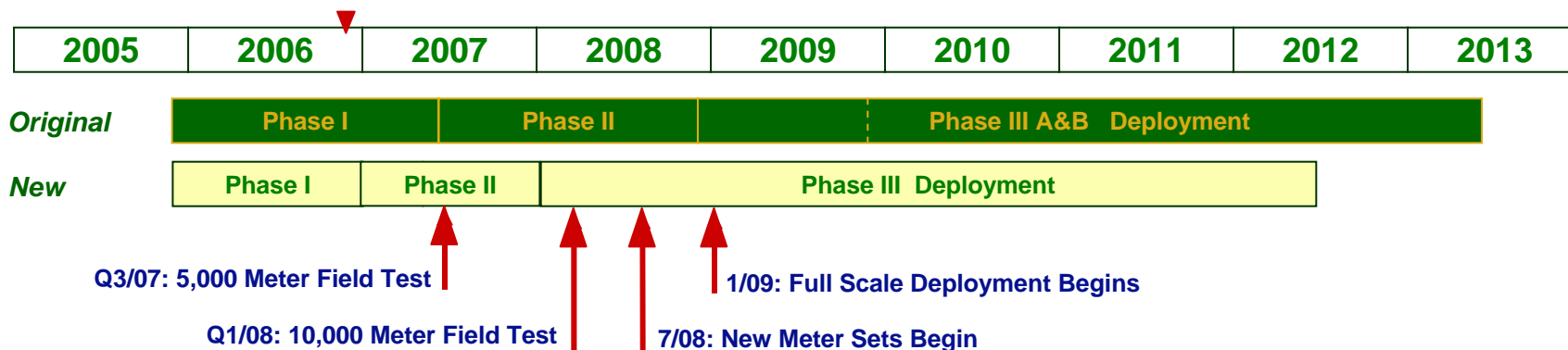
- Time of Use rates
- Service Automation
- Market Redesign
- 2008 T24 PCT
- Plug-In Hybrids
- Smart Appliances
- Solar Metering
- 2011 T24 Ballasts
- Home Automation

Open innovation with vendors and industry to create new business value through design based on EPRI's Intelligrid and DoE's Gridwise



Customer Benefits One Year Earlier

SCE is expecting to complete deployment one year ahead of original schedule



Phase I: "Design" is ahead of schedule, under budget, and will be completed by YE 2006

- SCE expects to file Phase II application in December 2006 with approval expected in Q2 2007
- Memo account was requested to record costs until Phase II application approval

Phase II: "Pre-deployment" will begin in January 2007 through December 2007

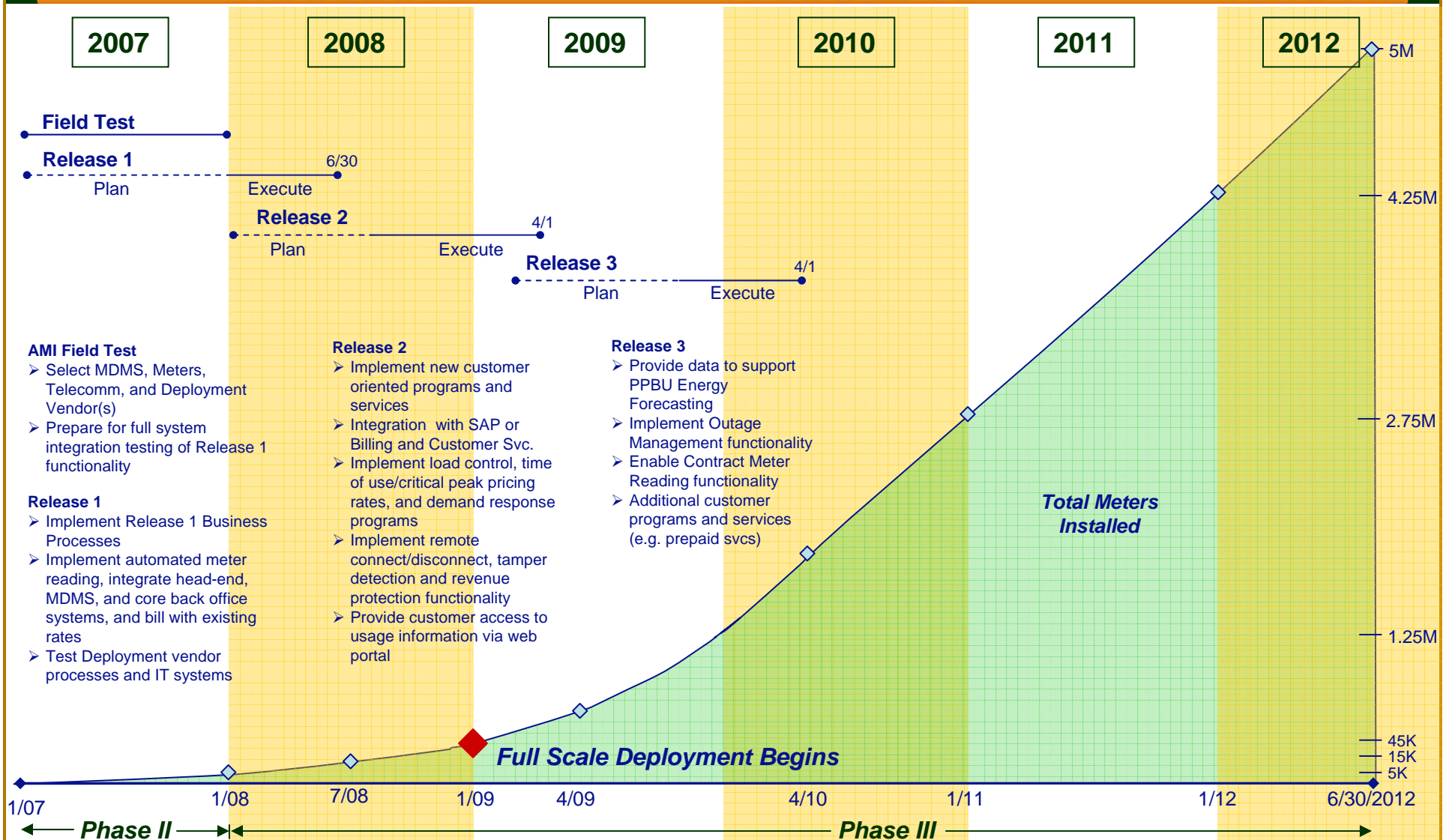
- Scope includes field tests for meters and telecommunications & Meter Data Management System installation in test environment
- SCE expects to file its final AMI business case for Deployment in Summer 2007 and final approval expected in Q1 2008

Phase III: "Deployment" will begin in January 2008 through June 2012

- Deployment will start with 2nd field test, logistics set-up, telecom network installation, and new meter sets beginning July 2008
- Large scale meter installations begin in January 2009 thru June 2012

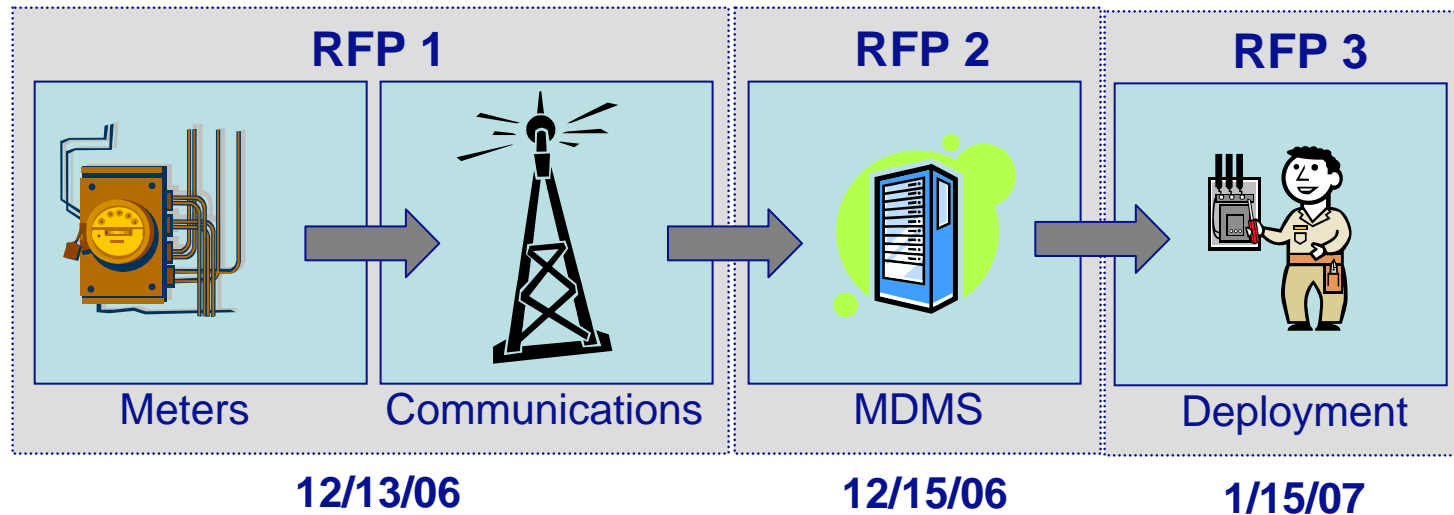
* Current plan subject to change

AMI Phase II & III Timeline*



* Current plan subject to change

AMI Procurement



Objectives

Meet AMI Business and Technical Requirements:

by selecting up to two communications vendors and two meter vendors.

Minimize Total Cost of Ownership:

by considering, and balancing multiple cost drivers such as functionality, performance, future upgrades, etc.

Shift Performance Risk to Vendor:

by developing contract terms and conditions that support key business benefits.



Meter/Communications RFP - Considerations

RFP Strategy and Content Guided by Multiple Considerations

- Two communications vendors may be needed to obtain 100% coverage
- Two meter vendors are desired to mitigate product or vendor-related risks
- Contracted service level agreements and performance standards
- Consider contracting structures (e.g. meter company as prime contractor) to facilitate more efficient management of the system and its performance
- Negotiate declining product pricing structure
- Targeting improved warranty coverage
- Requesting post-warranty “limited” coverage to ensure meter product reliability

Risks

Introduction Risk Matrix - Meters										
Risk Categories	Engineering and Design	Manufacturing	Integration of Third Party	Quality Control and Assurance	Delivery Methods	Acceptance Testing	Regulation / Compliance	Inventory Management	Training Services	Support Services
Performance Risk	Defective design	<ul style="list-style-type: none"> → Deviation to manufacturing info (e.g. force majeure, disaster) → Inability to deliver specified quantities of meters 	<ul style="list-style-type: none"> → Integration problems with third party components → Consistent quality problems with meters → Disagreements with meter vendor over acceptance testing results 					<ul style="list-style-type: none"> → Lack of adequate inventory for meter deployment → Inadequate/improper training for deployment technicians 		
Legal/Regulatory Risk	<ul style="list-style-type: none"> → Patent infringement claim due to product design → Change in laws / regulatory scheme that requires significant changes to meter 	<ul style="list-style-type: none"> → Patent infringement claim due to product design → Patent infringement claim due to combination of products 						<ul style="list-style-type: none"> → Unwillingness of vendor to commit to providing long term support for meters 		
Commercial Risk		<ul style="list-style-type: none"> → Increased demand for meters from SCE competitors/other utilities → Change in control of meter vendor → Adequate change in meter vendor's financial condition → Unpredictable pricing for spare parts in "hot" years 								
Supply Chain Risk		<ul style="list-style-type: none"> → Inability to obtain critical meter components → Adverse change in third party supplier's financial condition → Change in control of third party supplier 								
Governance Risk	<ul style="list-style-type: none"> → Unwillingness to share critical engineering design information with third parties providing other parts of AMI solution → Unwillingness to integrate and integrate third party components into meter 									

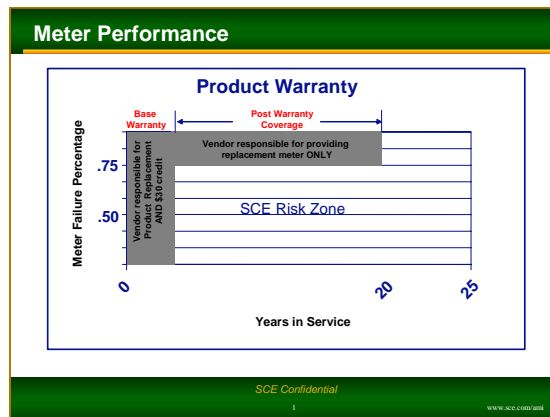
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Warranty

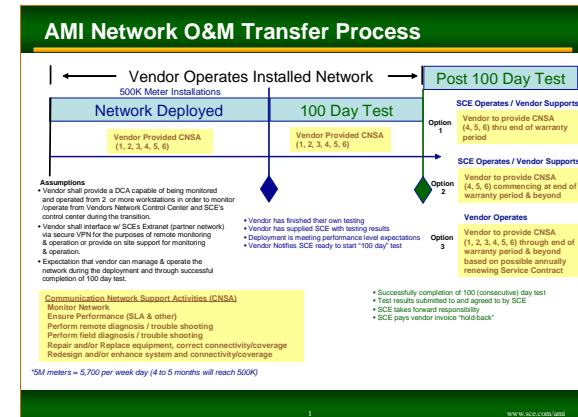


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Performance



*5M meters = 5,700 per week day (4 to 5 months will reach 500K)

Meter / Communications Candidate Vendors

RFP Recipient list:

- Cellnet (comms)
- Echelon (meter)
- Eka Systems (comms)
- GE (meter)
- Itron (meter and comms)
- Landis + Gyr (meter)
- Sensus (meter and comms)
- Trilliant (comms)
- USCL Corporation (meter)

Vendors not receiving RFP:

- 30+ companies who responded to Dec. 2005 RFI but did not meet minimum technical requirements and/or project timelines.
- The RFI respondents have been notified they will not receive the RFP

Regulatory

➤ **Completed Phase I Deliverables**

- Conceptual Feasibility Report including results of market assessment
- AMI Requirements Documentation

➤ **In-Progress Phase I Deliverables**

- Meter/Telecomm and MDMS RFP release in Dec. 2006
- Design and Testing Results
- Final Feasibility Report

➤ **Next Steps**

- Request memorandum account for Phase II, November, 2006
- File Phase II, Pre-deployment application – December, 2006
 - *Summary of Phase I activities*
 - *Phase II Scope, Schedule & Budget*
 - *Preliminary Full Deployment Cost-Benefit Analysis*
- File Phase III, Full-deployment application – Summer 2007

Phase II Overview

Phase II Charter: *Jan 1, 2007 to Dec 31, 2007*

Mission:

- Empower customers to realize value by effectively preparing people and managing the development and testing of products, processes and technologies that reliably scale for full advanced meter deployment

Scope:

- In preparation for full advanced meter infrastructure deployment:
 - Select majority telecommunication and metering solutions (at least 2 meter types)
 - Complete the first field test of primary AMI Meter(s) and Telecommunication Solutions
 - Prepare and implement the Meter Data Management System (MDMS) in the SCE test environment
 - Select deployment vendor and establish SCE and vendor processes for Phase III deployment
 - Develop tariffs and programs to allow customers to benefit from full advanced meter deployment
 - Obtain regulatory approval for Phase II and III
 - Phase III planning and preparation

Objectives:

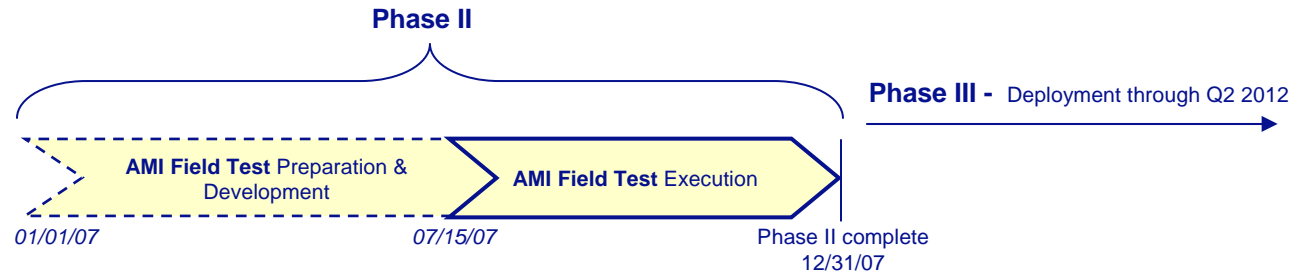
- **AMI Product Management:** Test and select majority technology solutions
- **Information Technology:** Test the automation of reading from the meter to the DCA and continue the manual meter read entry into the production billing system(s). Develop and configure IT systems in preparation for Release 1
- **Business Process Design:** Identify and develop to-be business processes to support advanced metering capabilities for AMI Field Test and AMI Release 1. Implement AMI Field Test processes to support Field Test deployment.
- **Organizational Readiness:** Establish people processes and external engagement activities
- **Regulatory/Business Case:** Obtain regulatory approval and funding for Phase II; submit Phase III regulatory filing for approval
- **Customer Tariffs, Programs & Services:** Develop business case critical offerings to allow customers to benefit from full advanced meter deployment
- **Field Deployment:** Manage Field Test deployment, select Phase III deployment vendor and establish vendor and SCE processes and technology that reliably scale for full advanced meter deployment

AMI Phase II & III Field Test and Release 1 Schedule

AMI Phase II Focus for the AMI Field Test

Phase II – AMI Field Test :

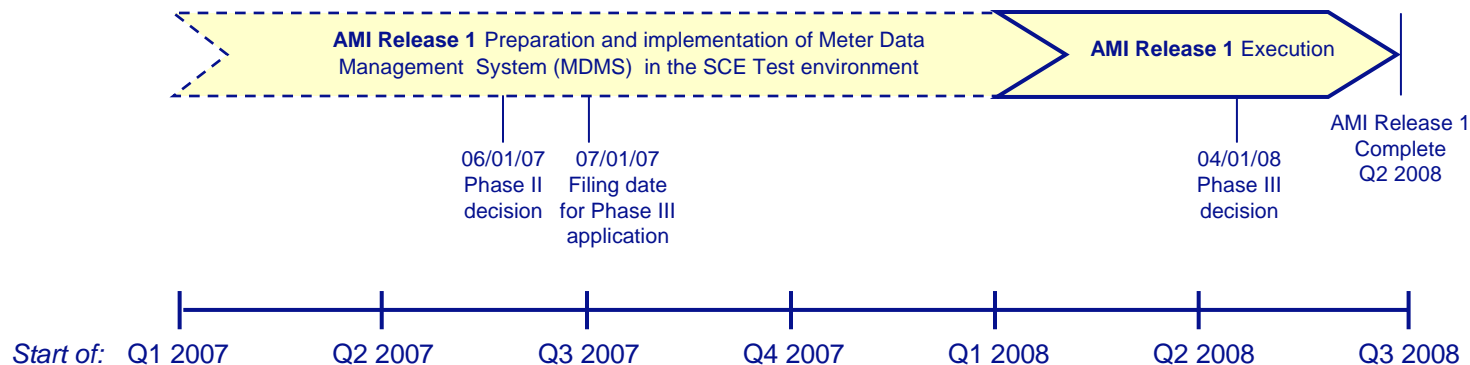
- Complete first field test of primary AMI Meter(s) and Telecommunication Solutions



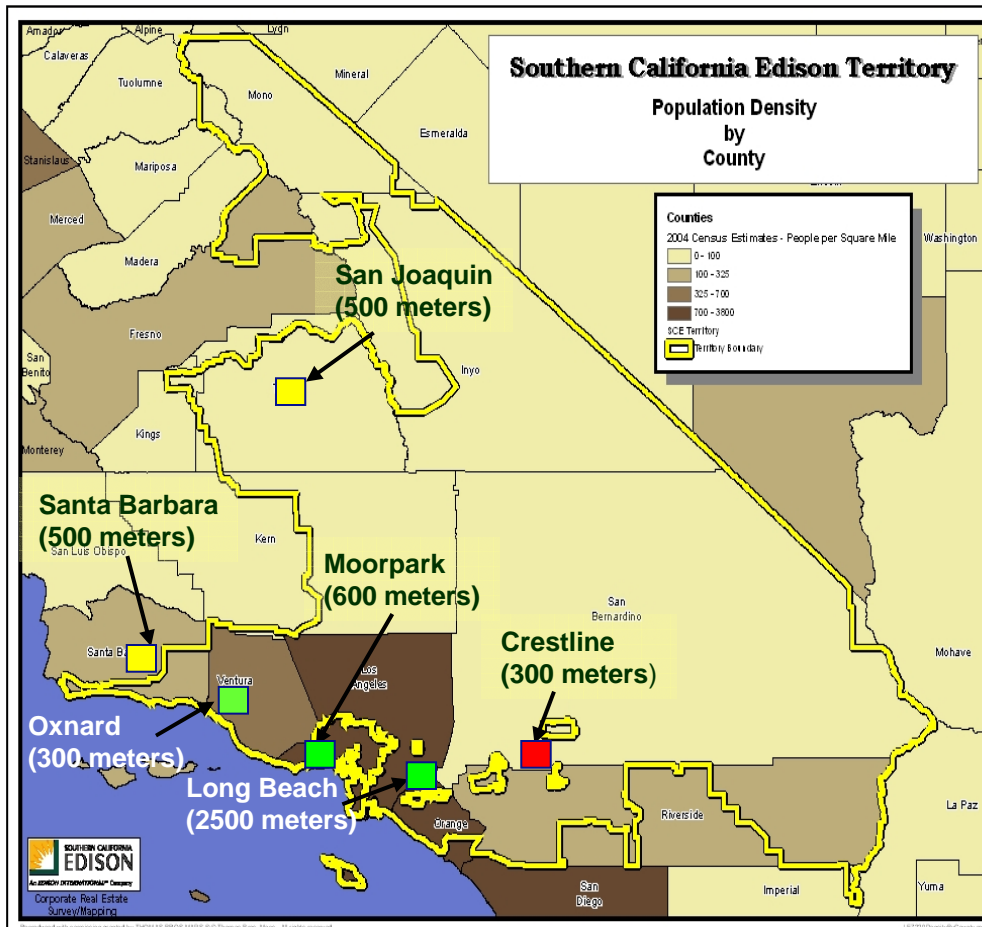
AMI Phase II and III Focus for AMI Release 1

Phase II and III AMI Release 1 :

- Complete implementation of AMI Release 1 functionality
- Test vendor deployment, processes and technology
- Develop AMI programs and tariffs to deliver customer value
- Establish and implement people processes, and external engagement activities



Phase II: 5,000 meter Field Test



- Field Test is focused on testing the throughput and coverage of the majority network communications solution and will include installing meter in the following geographies:
- Long Beach/Signal Hill 2,500 meters
- Thousand Oaks/Moorpark 600 meters
- Ventura/Oxnard 300 meters
- Santa Barbara/Carpinteria 500 meters
- San Joaquin/Porterville 500 meters
- San Bernardino Mountains 300 meters
- **Total 4,700 meters**
- Specific conditions being tested include the effects of the following on network performance:
 - Interference
 - Temperature, weather & climate
 - Terrain & vegetation (mountains, canyons, etc)
 - Distance between meter & public access point
- Field Test will also include installing 100 meters each in 3 additional geographies for a total additional 300 meters to support community engagement.

For majority telecommunications solution:

- Limited communications challenges expected
- Some communications challenges expected
- Significant communications challenges expected

** Current plan subject to change*

AMI Phase II Cost Estimate Summary

(\$Thousands)

	O&M	Capital	Total
By Functional Area			
AMI Product Management *	\$ 4,900	\$ 8,300	\$ 13,200
Information Technology	3,900	11,600	15,500
Field Deployment	700	600	1,300
Business Process & Organizational Readiness	1,700	-	1,700
Customer Tariffs, Programs & Services	1,200	-	1,200
Program Management	8,000	-	8,000
Systems Integrator	8,500	10,100	18,600
Contingency	3,100	4,400	7,500
Total	\$ 32,000	\$ 35,000	\$ 67,000
By 2007 Quarter			
Q1	\$ 6,300	\$ 5,000	\$ 11,300
Q2	8,100	6,400	14,500
Q3	8,100	13,800	21,900
Q4	9,500	9,800	19,300
Total	\$ 32,000	\$ 35,000	\$ 67,000

*Includes meter/telecomm procurement and quality management

AMI Product Management

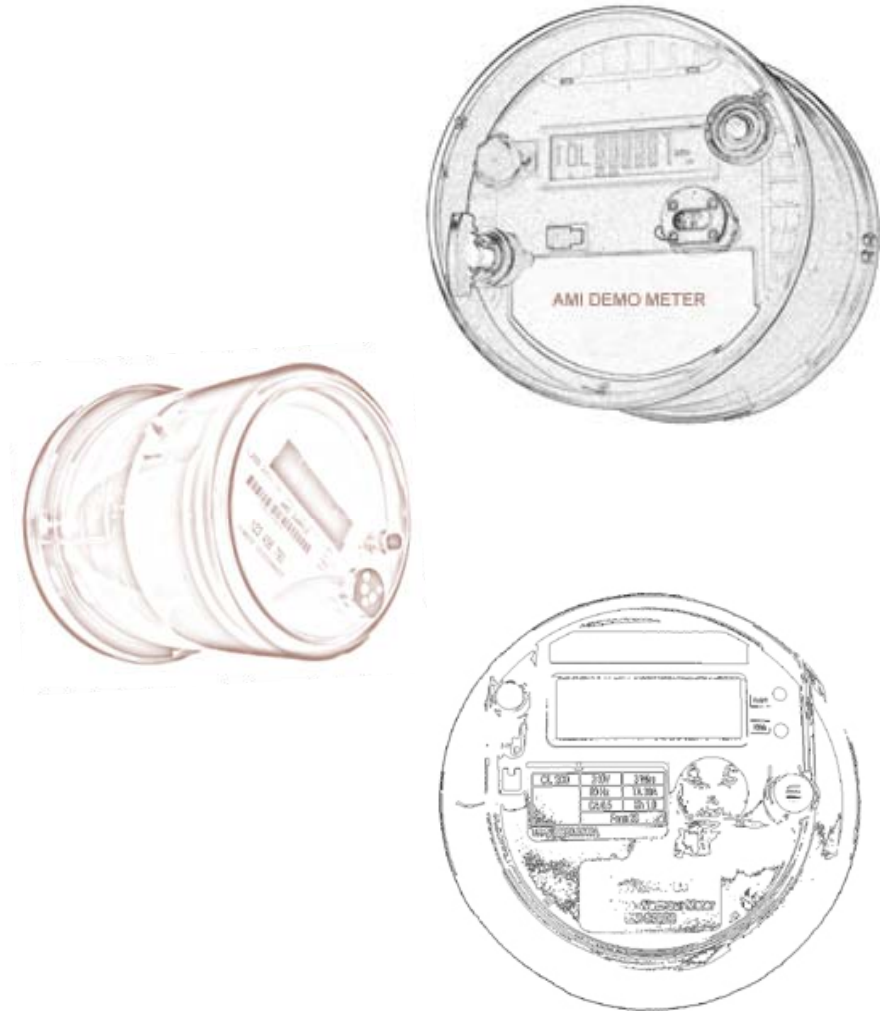
Product Development Activities

- **Next Generation Product Materializing**
- **Product Testing**
- **SCE Meter Shop & Lab Testing Environments**
 - Westminster Facility
 - Alhambra Test bed
 - Home Area Network
- **Product Sourcing – AMI Meter / Communications RFP**
 - RFP Considerations

Next Generation Product Materializing

AMI Meter Products

- 3 meter manufacturers have delivered Prototypes.
- At least 2 additional manufacturers prototypes expected near year-end.



AMI Network Communication Products

- Communications field element hardware received from two different Suppliers
- 3 additional suppliers expected to delivery product before year-end.

AMI Product Testing

Product Testing

- Meter Components
- Meter Products
- Integrated Meter Products (w/ Communications)
- Network Communication Field Equipment
- Radio Frequency Network Performance
- Home-Area-Network Performance
- Accelerated life testing

Rigorous product testing is underway and will continue to be performed in 3 different lab environments in advance of any field trials to ensure initial quality and performance expectations are met.



SCE's Meter Shop and Lab Testing Environments

SCE's Westminster Meter Test Facility



SCE's state-of-the-art Meter Test facility is an industry leader in meter test capabilities. Our skilled Engineers ensure product reliability and safety. Many of the large and well known Meter Manufacturers have relied on SCE's testing experience.

Newly Constructed Alhambra Test Bed



SCE constructed 40 structures at a facility located in Alhambra CA. These structures are wrapped in chicken wire and were designed to simulate residential home construction to provide a unique and flexible test site.

Home Area Network (Zigbee Test House)



One of SCE's Communications Engineers set-up initial testing of the Zigbee protocol in his own home.

Westminster Meter Testing Facility

SCE Controlled Environment Testing

Component Level Testing

- *Completed disconnect switch evaluation of three manufacturers' devices*
- *Conducted accelerated life testing of existing meter products*

Next Generation Meter Product Testing

- *Laboratory testing has begun on a quantity of one Meter Mfg's AMI product*
- *Expect to begin testing on second Meter Mfg's AMI product next week*
- *Additional AMI Meter product testing expected to commence before year-end*



Alhambra Network Communications Test Bed

AMI Network Communications Testing

- *Initiated laboratory testing is underway on two communications Suppliers' products*
- *Radio Frequency signal propagation and Meshing capabilities being explored*

Communications Testing



Home Area Network Testing

HAN Testing

- *Early testing of signal propagation and strength in a real-world home environment*
- *Next steps include pre-commercial product testing in both controlled environments and employee homes*

HAN Communications Testing

