

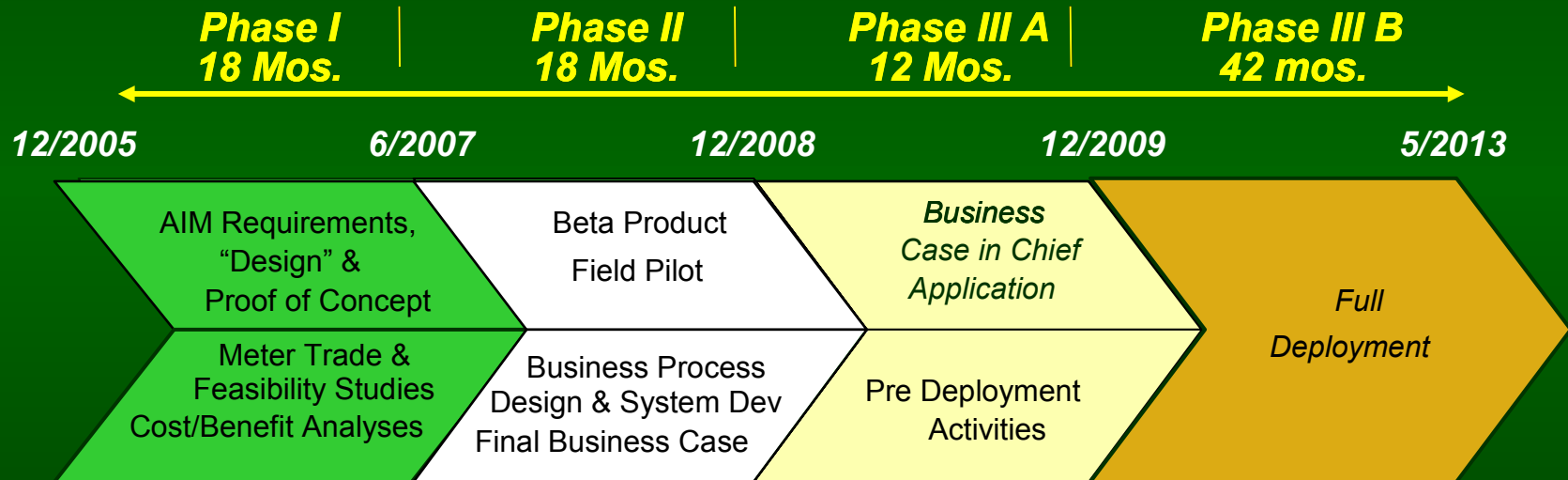


AMI Program Phase I Technology Assessment

AMI Technology Vendor Briefing
February 3, 2006

AMI Phase I

AMI Program will use a multi-phased approach to development and deployment of a next generation advanced metering infrastructure over a 7 ½ year timeframe.



SCE AMI Business Case – Directional Cost/Benefit

Address fundamental cost drivers for last business case

- Telecom network coverage, performance, reliability and system management
- Meter failures and life-cycle performance
- Interoperability & system security
- End-to-end data management

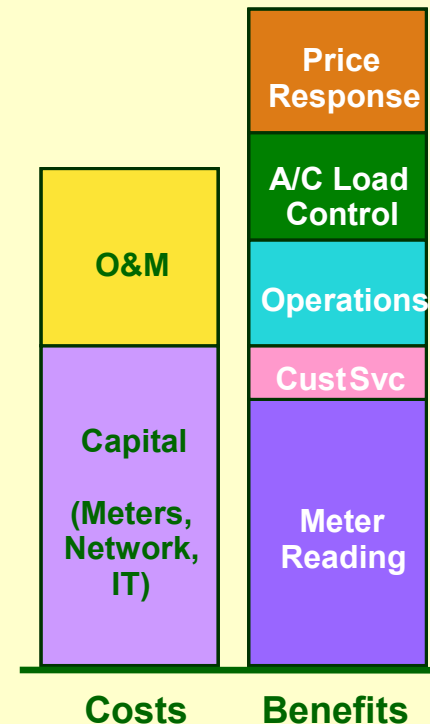
Re-evaluate Aug 1st added functionality

- Interface to A/C load control thru PCT
- Remote service turn on/off

Identify additional uses for system based on tangible customer and business value

Develop new conceptual estimate of overall business case

SCE Proposal AMI



SCE Aug., 2005 Supplemental Testimony supporting Phase I

Phase I Program Scope

External Engagement

Regulatory
Stakeholder
Engagement

Technology
Advisory Board

Industry
Standards

Utility
Collaboration

System Design

Business & Functional
Requirements

Reference
Architecture

Trade-off
Analysis

Technology Development

Vendor
Engagement

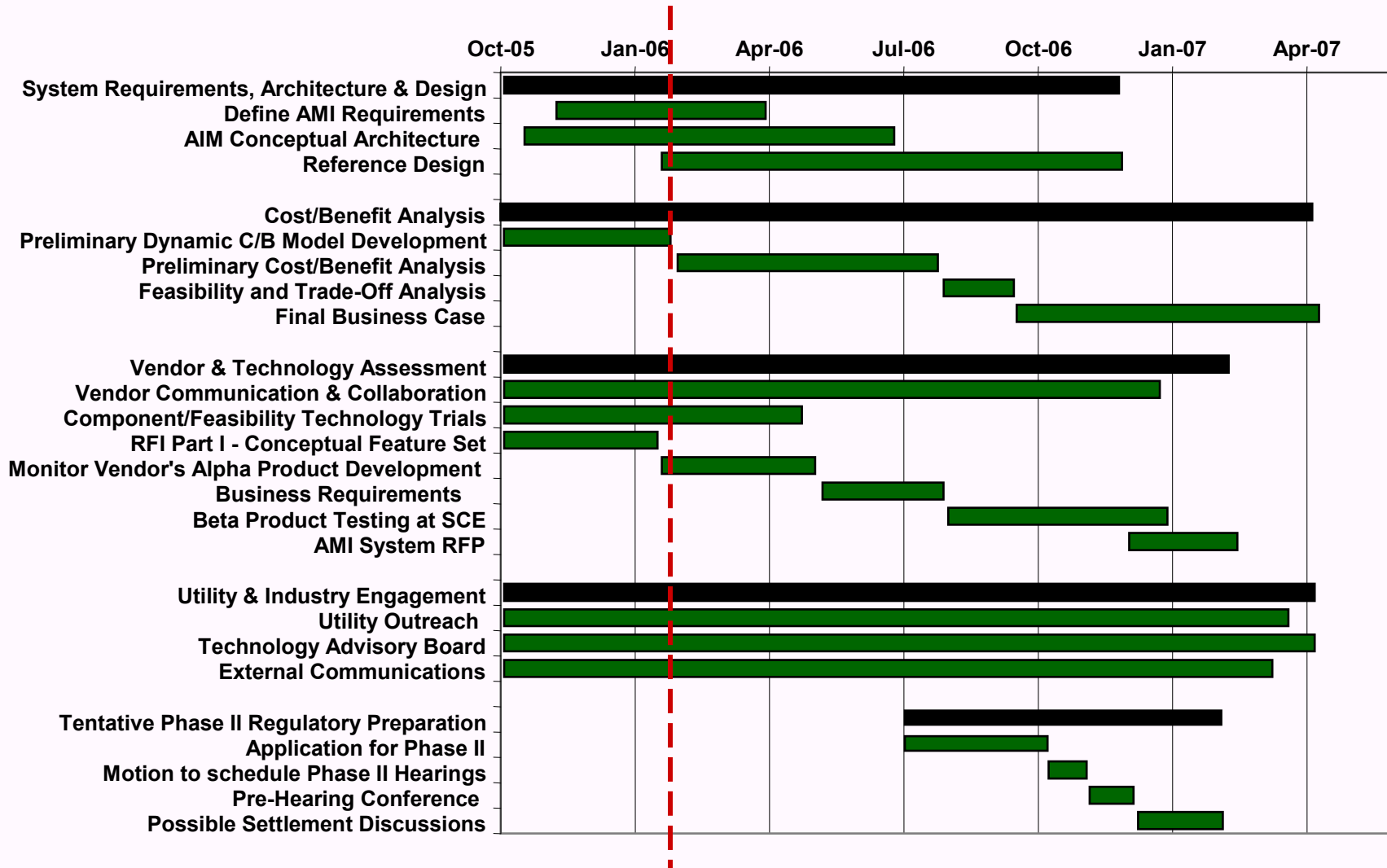
Technology
Evaluation

Vendor Product
Bench Testing

Cost/Benefit
Analysis

Preliminary Business Case & Regulatory Application

AMI Phase I Summary Schedule



Development Challenges

Collaborate with vendors to achieve the right balance among Marketability, Functionality and Openness

Marketability

Leverage OpenAMI, Intelligrid, Gridwise, CEC PCT, ANSI & other standards and reference design initiatives

Engage other utilities & vendors in development process to generate interest and feedback

Openness

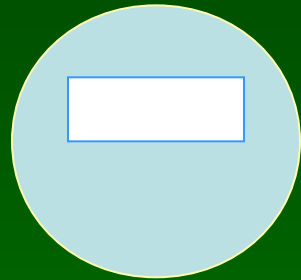


Functionality

Durable open design that will support a solid positive business case that provides customer value

Building Block Approach

Metrology



Communications



Local Area Network
Wide Area Network Interface
Home Area Network Interface (HAN)

- PQ Metrics
- Integrated Disconnect
- Integrated Intelligence
- Enhanced Memory
- >15 Year MTTF

- Full Two-way
- Upgradeability
- Multiple integrated WAN options
- Minimal network Administration
- Self registry capabilities
- Reliability
- 3 X 3
- Security



In-Home Display Devices

Usage / Cost Profiling
Messaging
Etc...



Lighting Controls

Electronic Ballast
Wall Switches
Area lighting
Etc...



Load Switches

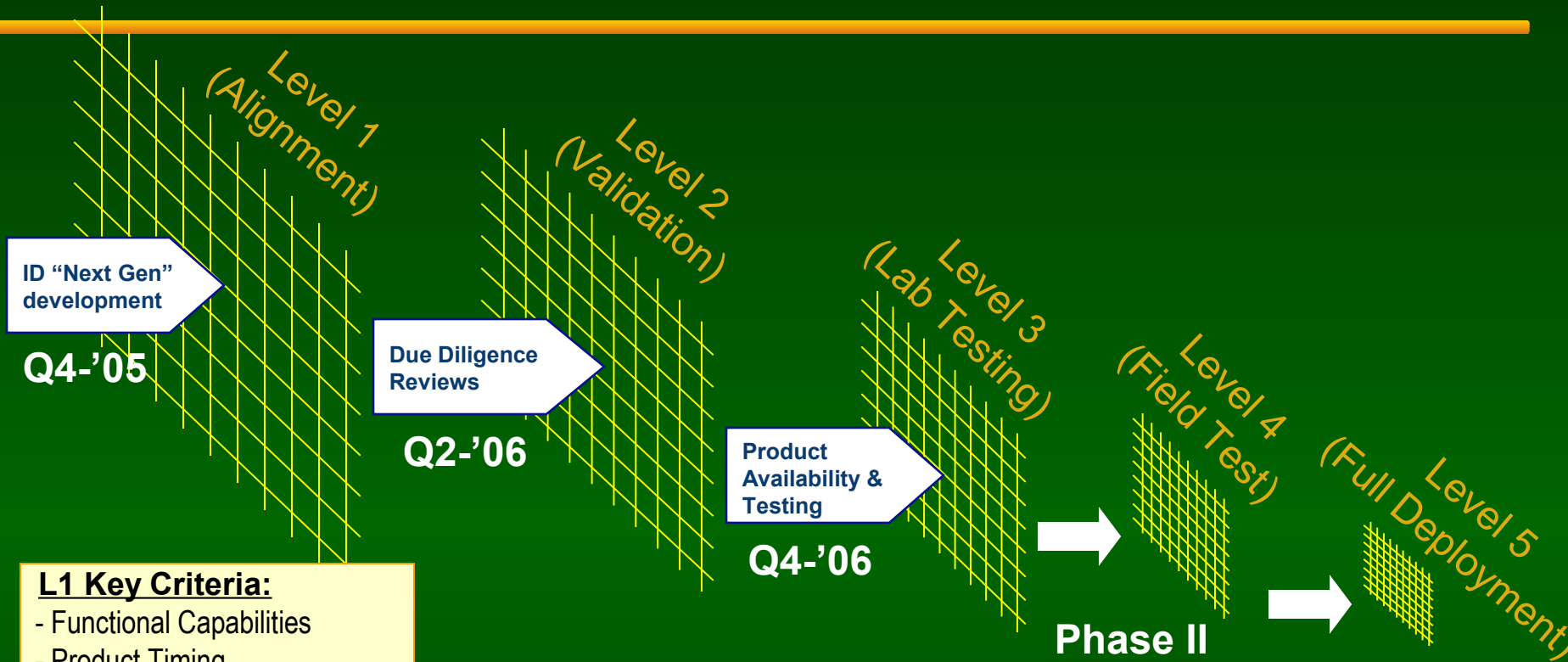
A/C Compressor
Pool pump
Outlet device
Intelligent Circuit Breakers
Etc...



Smart T-stat

Display
Confirmation
Data capabilities
Etc...

SCE AMI Technology Assessment Approach



L1 Key Criteria:

- Functional Capabilities
- Product Timing
- Commercial availability
- 3 X 3 Interoperability
- 2-way
- Reliability & Availability
- Security
- Serviceability
- HAN Capabilities
- WAN Options
- Target price range
- MTTF
- Other

L2 Key Criteria:

- Design Development
- Production Capabilities
- Financial Condition
- Processes:
 - Business / Development
 - Manufacturing (NPI)
- Supply Chain
- Small Requirements Gaps
- Other

L3 Key Criteria:

- Successful Lab Test
- Added functionality
- Flexibility
- Commercial Terms
- Other

SCE AMI System Architecture Principles

Specific technologies will be evaluated based on their ability to enable these overall AMI system behaviors and design principles.

Availability is the percentage of the scheduled uptime during which a system is actually available to users. Availability affects service at many levels.

Reliability is the probability that a component will perform its required functions for the duration of a specified time.

Interoperability (a.k.a.) Openness is the degree to which the system's configuration permits transparent access and integration among multi-vendor equipment and applications.

Serviceability - The ease with which corrective maintenance or preventative maintenance can be performed on a system. Higher serviceability improves availability and reduces service cost. Serviceability is a broad definition which includes the following system behaviors and design principles.

- **Manageability** is the degree to which available system administration and application management resources can maintain and operate the system. It is the degree to which the configuration minimizes maintenance requirements and supports problem evaluation and easily replaceable components.
- **Maintainability** is the probability that a failed component is returned or restored to a specified condition when maintenance is performed by personnel with specific skill levels, using prescribed procedures and resources
- **Extensibility** is a system design principle where the implementation takes into consideration future growth. It is a systemic measure of the ability to extend a system and the level of effort required to implement the extension. Extensions can be through the addition of new functionality or through modification of existing functionality. The central theme is to provide for change while minimizing impact to existing system functions.

Securability is similar to manageability in the way it affects the solution. Securability includes: Authentication; Authorization; Confidentiality; Data Integrity; Non-repudiation; and Availability.

SCE AMI System Architecture Principle - *Example*

Create a requirement for interoperability that is supported by multiple meter and communications vendors and is commercially viable in the NA utility market (“3x3”)

3x3 Example: A meter manufacturer’s residential product can successfully integrate with three different communication solutions

AMI Solution A

AMI Solution B

AMI Solution C



Interoperability (a.k.a.) Openness is the degree to which the system’s configuration permits transparent access and integration among multi-vendor equipment and applications.

Next Steps

- RFI response clarification interviews: Feb. 13 – Mar.10
 - Kema will be contacting each firm to set-up phone interviews
 - Please be prepared to clarify responses given to RFI
 - Interviews will be limited in scope to answers already provided and therefore, we expect that NDAs will not be required at this stage
 - If you have or will soon have product available for testing please be prepared to discuss timing and the opportunity for us to witness testing at your facility prior to our acceptance for our lab testing.
- Release of SCE's AMI Requirements: by early April
 - Business and functional requirements will be emailed directly to each firm
 - Requirements will also be posted on our website
 - Please ensure that we have your current contact info – we have updated our database based on your RFI responses

For more information and updates on the AMI program including key work products, procurements, business cases and filings. visit our website @ www.sce.com/ami

Any inquires about the December RFI should be forwarded to Paul Kasick, Manager AMI Technology Assessment, AMITechnology@sce.com.