CEC Load Management Proceeding
AMI Business Case
May 27, 2008
Program Objectives

• Install AMI/smart metering for all San Diego County and Southern Orange County electric and gas customers

• Enhance customer service and improve utility operations

• Provide foundation for SDG&E’s smart grid and smart home

• Ensure net positive benefit case based on thorough business case development
SDG&E’s Business Case Development (“Solution Implementation Roadmap”)

- Systematic & logical approach begun in 2005
  - Benefits driven
  - Business process design required to achieve benefits
  - Requirements needed to achieve business process changes
  - AMI technologies & information systems needed to achieve requirements
  - TCO model
  - Vendor solicitation & evaluation
  - Solution implementation roadmap

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Develop AMI Requirements

- Target AMI Benefits
  - Operational, Customer Service, Asset Mgmt, Energy Efficiency
- Develop “To-Be”, AMI enabled, business processes
  - Best Practice models
- Gap “To-Be” versus “As-Is” business processes
  - Identify what has to change
- Identify functional & information requirements of “To-Be” business processes
  - Quantify changes
- Identify future IT/System requirements & gap versus current
  - AMI + IT infrastructure
- Develop customer segmentation strategy
  - Explore viable cost/benefit implementation scenarios
- Develop preliminary TCO & Benefit Model
  - Quantified benefits & industry metrics
Develop Vendor Solicitations

AMI Solicitation

Evaluate & Analyze

Architect & Recommend

- Define business & functional requirements
  - Prioritize and categorize identified requirements
  - Translate requirements to vendor solicitations
- Define technical & integration requirements
  - Performance, accuracy, reliability, & integration specification of AMI systems per defined segmentations
  - System integration matrix & requirements
- Define project implementation & deployment requirements
  - Deployment requirements/services
  - Configuration/customization/integration requirements/services
  - Testing & training requirements/services
  - Operations, maintenance & support requirements/services
  - Documentation requirements/services

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Evaluate Candidate AMI Systems

- Develop response evaluation criteria
  - Technical, implementation, deployment, cost/benefit
  - Experience, effectiveness, responsiveness, stability

- Evaluate candidate systems
  - Score vendors against requirements
  - Evaluate segmentation scenarios, assess alternatives
  - Assess TCO & risk factors

- Finalize customer segmentation
  - Based on vendor technical & cost responses
Solution Architecture, Roadmap, & Recommendations

- **Solution Architecture**
  - AMI & IT system constraints & assumptions
  - Logical & physical architectures
    - Components, functional/information flow, physical instantiation
  - Architecture principles
    - Availability, reliability, scalability, performance

- **Solution Implementation Roadmap**
  - Business process changes & supporting system implementation
    - Implementation plans & milestones, Costs & Benefits by milestone
  - AMI deployment strategy by customer segment
  - Risk analysis

- **Final TCO & Benefits**
  - Benefits & Lifecycle costs

- **Recommendations**
## Initial Solution Implementation Roadmap
Timeline & Participation 2005-2006

<table>
<thead>
<tr>
<th>Step</th>
<th>June - Aug</th>
<th>Aug-Oct</th>
<th>Oct-Dec</th>
<th>Dec-Feb</th>
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<tbody>
<tr>
<td>AMI Requirements</td>
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<td>Vendor Solicitation</td>
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<td>Evaluate &amp; Analyze</td>
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<td>Architect &amp; Recommend</td>
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<table>
<thead>
<tr>
<th>Participation</th>
<th>Benefits quantification</th>
<th>Comprehensive requirements</th>
<th>Vendor evaluation criteria</th>
<th>Solution architecture</th>
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<tbody>
<tr>
<td></td>
<td>Business process design</td>
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<td></td>
<td>Functional requirements</td>
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<td>Information requirements</td>
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<td></td>
<td>Vendor solicitation development</td>
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<td>Vendor scoring &amp; ranking</td>
<td>Solution implementation roadmap</td>
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Initial Benefit Sessions

- Meter Reading (Gas and Electric)
- Finance & Accounting
- Energy Procurement (Electric)
- Customer Billing
- Customer Call Centers
- Outage Management (Electric)
- Transmission & Distribution (Electric)
- Load Research (Electric)
- Meter Operations (Gas and Electric)
- Information Technology
- Credit & Collections
- Demand Response Programs
- Follow-up Meetings (as needed)
Business Process Design (BPD) Sessions

- CEC’s Six Policy Goals
- Tactical and Strategic Initiatives at SDG&E (related to AMI)
- IT Applications Overview (Customer care, Utility Operations, Shared Services)
- Customer Service Strategy & Priorities
- T&D Strategy & Priorities (Electric)
- Load Research (Electric)
- Demand Response Planning, Execution & Benefits Realization
- Meter Reading (Gas and Electric)
- Customer Billing
- Customer Call Centers
- Meter Operations (Gas and Electric)
- Energy Procurement (Electric)
- Information Technology – Strategy & Standards
- Information Technology – Current Applications & Data Marts
- Credit & Collections
- Revenue Management
- Demand Response Programs

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BPD Sessions Cont.

- Information Infrastructure & Strategy (E&O, Network, Business partners & strategic planning)
- Outage Management
- Planned Outages
- Reliability Reporting / Public Communications
- Storm / Event Management
- Transformer Load Management
- T&D Maintenance Planning
- T&D System Planning
- Distribution Engineering
- Distribution Automation
- Follow-up Meetings (as needed)
Final SDG&E Business Case

• Install 1.4 million smart/AMI electric meters for all customers
  • Solid-state electric meter technology
  • 2-way communications, 4-channel metering, next-day availability of data
  • Interval data – residential hourly, C&I every 15 mins.
  • Support price responsive tariffs
  • Customer access to personal energy usage data
  • Information systems, integration with legacy systems
  • Home area network (HAN)
  • Remote disconnect/connect integrated within meter
  • Adding module to existing 900,000 gas meters
  • Interface with load control technology
  • Programmable communicating thermostats (PCTs) or other load management devices for Small/Medium C&I
  • Vendor and technology neutral
<table>
<thead>
<tr>
<th>Benefit Categories</th>
<th>Current State</th>
<th>Future State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter Reading Automation</td>
<td>Manual meter reading</td>
<td>Automated meter reading – lower cost</td>
</tr>
<tr>
<td>Avoided Energy and Capacity</td>
<td>Targeted megawatts from Demand Response (DR) programs and incentive rates</td>
<td>Megawatts from DR rates (CPP/PTR), conservation and incentive programs</td>
</tr>
<tr>
<td>Other Management Cost Reductions</td>
<td>Numerous C&amp;I day-ahead DR programs</td>
<td>Avoided future day-ahead DR programs</td>
</tr>
<tr>
<td>Unmetered Energy Usage</td>
<td>Theft, meter error, meter changes</td>
<td>VEE, meter reprogramming</td>
</tr>
<tr>
<td>Capital Efficiency / Deferrals</td>
<td>Planning for peak load w/ limited feeder visibility</td>
<td>Planning for managed peak w/meter interval data</td>
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<tr>
<td>Access and Re-Bill</td>
<td>Rebills - late reads / read errors</td>
<td>Fewer rebills</td>
</tr>
<tr>
<td>Other Customer Service &amp; Operations Reductions</td>
<td>Load Research Sampling</td>
<td>Improved research / compliance processes</td>
</tr>
<tr>
<td>Outage Management</td>
<td>Customer outage reporting and manually initiated response analysis</td>
<td>Automated outage / restoration reporting and analysis</td>
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SDG&E Smart Meter Schedule

- New business processes
- Develop technology infrastructure
- Tierrasanta installs
- Train impacted groups

- Install network infrastructure
- Go-live of technology systems
- Install meters
- Manage customer experience

- New rates go into effect for majority of customers (CPP/PTR)
- Sustain change
- Provide knowledge
- Transfer from program team to employees

- Organizational alignment
- Complete installation of 1.4 million electric meters and 900K gas modules
- Program team dissolves

Build 2008  Install 2009  Install 2010  Wrap-up 2011

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SDG&E Deployment Schedule

Gas & Electric Meter Installation

Cumulative Meter Installs

Month

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