PG&E’s SmartMeter™ Program Quarterly Report was prepared in compliance with the following:

“PG&E shall provide quarterly reports on the implementation progress of the SmartMeter Upgrade to the Commission's Energy Division and any interested parties. PG&E shall consult with the Energy Division to determine what information to provide and to coordinate reporting requirements ordered in Decision 06-07-027.” (Decision 09-03-026, Ordering Paragraph 7)

PG&E met with the Energy Division and agreed to the format of this presentation.
Program Update
• CPUC Investigation Update
• Technology Advisory Panel Update
• PG&E continues to expand efforts to address customer concerns around SmartMeter™
• HAN Alpha 1 & 2, HAN Enablement Update
• Information Technology (IT) Timeline

SmartRate™ Program Update
• SmartRate™ enrollment statistics

Current Issues
• Non-SmartMeter™ CPUC filings impact Field Delivery and IT deployment

Deployment, Cost, and Benefits Update
Program Update
The Structure Group completed their independent investigation in September 2010:
• The Structure Group was identified as the CPUC’s independent assessment consultants and began their work in April 2010.
• Working under the supervision of the CPUC, the evaluation process addressed the following areas:
  • Whether PG&E’s SmartMeter™ system is measuring and billing electric usage accurately, both now and since meter deployment began.
  • Independent analysis of the high bill customer complaints.
  • Analysis of PG&E’s SmartMeter™ Program’s past and current operational and deployment processes, policies, and procedures as compared to industry best practices.

The Structure Group Report’s Key Findings about the SmartMeter™ Program:
• Generally consistent with industry standards for the Advanced Metering Infrastructure (AMI) program approved by the CPUC
• Accurate from metering, end-to-end system data processing, and customer billing perspectives
• No relevant correlation between installation of SmartMeters™ and residential customer high bill complaints.
• Various factors contributed to high bill complaints including customer usage changes, weather, rate changes, and gaps in customer service and complaint resolution processes
• Some PG&E practices are non- or only partially–compliant with industry Best Practices
• PG&E teams have been diligently working to plan and implement business process improvements to address these suggestions as best, and as quickly and efficiently as possible
PG&E initiated a panel to gather advice and input for SmartMeter™ customer/program needs:

- This AMI Technology Advisory Panel (TAP) draws upon representatives from the following agencies and groups:
  - CPUC Energy Division
  - CPUC Division of Ratepayer Advocates
  - The Utility Reform Network (TURN)
  - California Energy Commission
  - Industry technology experts
  - Customer representatives, and
  - Various groups within PG&E

- The initial kick-off meeting was held in October, as well as a second meeting in November. A charter as well as various topics of interest were agreed upon including but not limited to Overall program status and overview, Structure Group recommendations, meter deployment, data security, and customer education and outreach, etc.

- The TAP will work with PG&E so that PG&E's ongoing SmartMeter™ program design and deployment considers the "best available practices" and "best available technologies" and encourages customer acceptance of the new services enabled by the SmartMeter™ deployment.

- The Panel will meet on a regular basis, which is expected to be monthly at the outset to facilitate an accelerated ramp up for panelists on current progress and development of the program, and on a less frequent basis, e.g. quarterly after the group has been in operation.
Customer Outreach Strategy

- Initial outreach strategy: SmartMeter™ deployment equivalent to a standard meter change.
- Significantly expanded and improved customer communication and outreach based on customer learning and feedback.

**Initial Outreach Strategy (2007)**

- Pre-installation letter
- Door hanger
- Welcome booklet
- Energy Alerts postcard and/or e-mail

**Learning From Our Customers**

- Benefits unclear to some customers
- Awareness
- Satisfaction
- Inconsistent customer experience

**Current Holistic Outreach Strategy***

**Responding to Our Customers**

- Improved Communication Messages & Channels
- Multiple Contacts Through Sustained Media
- Responsive & Proactive Outreach
- Employee Education
- Readiness and Response Team

- Online tools in My Account
- Energy Alert via e-mail or text message
- Digital "Information is Power" ads on news sites
- See Your Power Blog
- PG&E’s PGE4ME Twitter Feed or Facebook
- Customer and third-party testimonial videos on www.pge.com/smartmeter and YouTube

- "Information is Power," TV commercials (2010)
- Retail Partnerships

- Customer Advisory Groups
- City Council presentations
- Homeowner’s association and civic group meetings
- CPUC workshops
- PG&E Answer Centers
- "Mobile tour" events

*Strategy will continue to evolve and adapt as customer needs change and deployment completes*
Alpha 1 (through June 2010)
- Lab-based evaluation of a selection of in-home displays (IHDs)

Alpha 2 (through October 2010)
- Delivery of usage information and simulated messaging scenarios (pricing, ad hoc messages) on a test network
- Evaluation of selected IHDs in 19 homes
- Ability to register and commission PG&E approved device to PG&E’s production customer systems
- Delivery of real time usage information to IHDs
- Deployment of up to 500 IHDs to residential and SmartMeter billed customers

HAN Enablement - Phase 1 (Est. Q2 2012 launch*)
- Depends on timely standards development and vendor alignment. SE 2.0 projected to finalize end of May 2011.
## Objectives

1. Further PG&E’s understanding of Home Area Networking (HAN) technology in preparation for large-scale customer roll-out
   - Evaluate devices and system interfaces in the lab against vendor specifications, ZigBee SE 1.0 standards, Radio Frequency testing, and head-end interoperability
   - Identify capabilities and limitations of select devices in presenting various message types (e.g., usage, pricing)
   - Understand the real-world technical challenges of installing and maintaining a ZigBee-based HAN (e.g., signal propagation, RF interference)

2. Build reusable lab-based capabilities to evaluate new products and standards

3. Gather early feedback from users on the effectiveness of in-home display devices

## Key Accomplishments

- Alpha 1 -- Completed lab set up and testing – performed radio frequency, SE 1.0 compliance testing, and head-end interoperability testing.
- Completed lab based network set up needed to connect participant homes to the PG&E labs
- Executed test message scenarios (usage, pricing, messages) to devices in participant homes
- Completed participant focus groups

## Key Challenges

- SE 1.0 does not provide a robust platform for device interoperability, requiring significant device troubleshooting and iterative prototyping
- Coordinate with third party product development
- Technical architecture and back-end systems need to be fully developed to support HAN, Demand Response (DR), Plug-in Electric Vehicles (PEVs) and other emerging technology solutions.
Objectives

1. Build business processes and systems to support secure registration and commissioning of PG&E-approved, standards compliant HAN devices
   - Devices can obtain near real-time premise level energy usage data from the meter
   - Ability to respond to customer inquiries and perform maintenance and support (tier 1 device support and tier 1-3 for AMI and SmartMeter)

2. Validate PG&E’s HAN solution with customers via a 500 point pilot of in-home displays with PG&E residential and SmartMeter™ billed customers

3. Proposed future phases of HAN Enablement will layer on additional, value-added functionality (e.g., pricing, load control)

Key Accomplishments

- Developed use cases, detailed business requirements, and a solution blueprint of the business impacts of the HAN lifecycle (e.g., device registration and commissioning, device maintenance and support, device decommissioning)
- Drafted technical solution design outlining the impacted systems and interfaces of the proposed IT solution
- Aligned the design phase of the project to commence with the SE 2.0 standard

Key Challenges

- Project depends on the successful completion of the SE 2.0 standard, market availability of certified devices, and vendor-driven upgrades of PG&E’s systems to support the new standard
- Lab testing will need to be performed again on SE 2.0 devices due to large differences with 1.0 (e.g., migration to IP, enhanced security, advanced functionality)
- Impacts to the AMI network will be reviewed to ensure that performance and security measures remain intact
- Standards-based HAN solutions for multi-dwelling units (MDUs) and other hard-to-reach premises are still not well defined and may constrain initial HAN deployments
### Capability Timeline

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deployment</td>
<td>SSN Deploy</td>
<td>Res &amp; Small Bus</td>
<td>AMI data collection</td>
<td>Interval Usage Collection and Billing</td>
<td>Enhanced Outage Notification</td>
<td>Lab Pilot</td>
<td>Further Enablement / Usage &amp; pricing signals currently TBD</td>
</tr>
<tr>
<td>Utility Operations</td>
<td>Meter Deployment</td>
<td>Outage detection</td>
<td>Remote disconnect</td>
<td>Large C&amp;I</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Area Network</td>
<td>Basic Information</td>
<td>Advanced Information and Decision Tools</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer Information Presentment</td>
<td>Smart Rate</td>
<td></td>
<td></td>
<td>Large C&amp;I</td>
<td>Small Business</td>
<td>Agricultural</td>
<td></td>
</tr>
<tr>
<td>Demand Response - Pricing Strategies</td>
<td></td>
<td>Peak Day Pricing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standards and Security</td>
<td>Funding Key</td>
<td></td>
<td></td>
<td></td>
<td>HAN SE 2.0</td>
<td>Smart Grid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non SM</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>SM</td>
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</tr>
</tbody>
</table>

- Peak Time Rebate regulatory schedule is currently suspended; initial May 2011 deployment date will require reset as part of that proceeding
### Current IT Functionality Roadmap

<table>
<thead>
<tr>
<th>Q3 2010</th>
<th>Q4 2010</th>
<th>Q1 2011</th>
<th>Q2 2011</th>
<th>Q3 2011</th>
<th>Q4 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Release H</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operationalize remote start/stop, power check, and disconnect</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Release I</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transition of certain existing interval metered customers and net to SmartMeter Billing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Release J</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outage management, detection, scoping, and restoration validation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Release O</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operationalize business process capability improvements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Performance and Scalability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enable SmartMeter billing at full deployment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>HAN Alpha I &amp; II</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pilot and test In Home Displays including consumption information, mock pricing, mock DR events and ad hoc messaging</td>
<td>Q3 Deploy</td>
<td>Q4 Deploy</td>
<td>10M Meters Scalability</td>
<td>Pilot Complete</td>
<td>SE 2.0</td>
</tr>
<tr>
<td><strong>HAN Enablement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deployment of up to 500 IHDs (In Home Devices) to SMB &amp; residential customers with communications over the production AMI network</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Remote Connect Disconnect 2**
- **ABS migration to CC&B**
- **NEMS Migration to CC&B**
- **Transformer Loading Management (TLM) Analyze**
- **Q3 Deploy**
- **Q4 Deploy**
- **10M Meters Scalability**
- **Pilot Complete**
- **SE 2.0**
### 2010 YTD – as of September 30, 2010

<table>
<thead>
<tr>
<th>Metric</th>
<th>Overall System</th>
<th>Manual</th>
<th>SmartMeter</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of bills not estimated</td>
<td>99.29%</td>
<td>98.79%</td>
<td>99.87%</td>
</tr>
<tr>
<td>% billed timely</td>
<td>99.70%</td>
<td>99.64%</td>
<td>99.83%</td>
</tr>
</tbody>
</table>
SmartRate Program Update
<table>
<thead>
<tr>
<th>Figures as of 9/30/2010</th>
<th>Enrolled**</th>
<th>Active**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Customers</td>
<td>32,866</td>
<td>24,677</td>
</tr>
<tr>
<td>CARE Customers</td>
<td>12,800</td>
<td>11,857</td>
</tr>
<tr>
<td>Top 3 Areas:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bakersfield</td>
<td>10,057</td>
<td>6,572</td>
</tr>
<tr>
<td>Fresno</td>
<td>4,188</td>
<td>3,333</td>
</tr>
<tr>
<td>Stockton</td>
<td>1,764</td>
<td>1,479</td>
</tr>
</tbody>
</table>

* Enrolled – Total number of customers enrolled in SmartRate since inception  
** Active – Number of customers still participating in the SmartRate program
Current Issues
• While implementing SmartMeter™ related IT releases, PG&E is concurrently implementing an unprecedented volume of IT changes due to other demand response initiatives and regulatory programs, including but not limited to Peak Time Rebate (PTR), Peak Day Pricing (PDP) and the 2011 General Rate Case (Structural Rate Changes). The nearly simultaneous nature of these changes increases the execution risk and change management challenges.

• To avoid adverse impacts on the regulatory required changes, PG&E has taken the following actions:
  
  **Release H:** Placed Release H (remote connect / disconnect 2) on hold. PG&E is developing a new plan to deliver the Release H functionality.
  
  **Release I:** Delayed implementation and deployment of Net Energy Metering (NEMs)
  
  **Release K:** Will align interval billing enhancements to support PTR, PDP, Smart Rate, Time of Use and SmartMeter™ initiatives to achieve current service levels for timely and accurate billing.
Deployment, Cost, and Benefits Update
Electric Network Installations

Cumulative Electric Network Installations: Substation Communication Equipment & RF Mesh Access Points

Key:
- **Electric Network build to date - Substation Communication Equipment Actuals Thru Dec-07**
- **Mesh Electric Network Plan - Access Points**

<table>
<thead>
<tr>
<th>Year 1 (Inception to Dec-07)</th>
<th>Year 2 2008</th>
<th>Year 3 2009</th>
<th>Year 4 2010</th>
<th>Year 5 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Electric Network Installations</td>
<td>51</td>
<td>221</td>
<td>886</td>
<td>1,182</td>
</tr>
<tr>
<td>Electric Network Equipment Installed</td>
<td>1,227</td>
<td>1,227</td>
<td>1,227</td>
<td>1,182</td>
</tr>
<tr>
<td><strong>Plan</strong></td>
<td><strong>Actual thru Sep '10</strong></td>
<td><strong>19%</strong></td>
<td><strong>75%</strong></td>
<td><strong>104%</strong></td>
</tr>
</tbody>
</table>
### Cumulative Data Collection Units (DCU) Network Installations

**Key**

- **Plan**
- **Actual thru Sep '10**

<table>
<thead>
<tr>
<th>Year</th>
<th>Total (DCU) Installations</th>
<th>Year 1 (Inception to Dec-07)</th>
<th>Year 2 2008</th>
<th>Year 3 2009</th>
<th>Year 4 2010</th>
<th>Year 5 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>5,000</td>
<td>10%</td>
<td>487</td>
<td>1,800</td>
<td>3,632</td>
<td>4,477</td>
</tr>
<tr>
<td>Year 2</td>
<td>5,000</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 3</td>
<td>5,000</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 4</td>
<td>5,000</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 5</td>
<td>5,000</td>
<td>100%</td>
<td></td>
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</tr>
</tbody>
</table>

Additional access points will be installed to increase read rates in certain areas where required.
End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

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Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

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Cumulative Meter-Module Installations (in 000s)

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Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)

End-Point Installations

Cumulative Meter-Module Installations (in 000s)
Total Project Costs By Year ($ Millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Current Plan</th>
<th>Actual thru Sep '10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>$2,206</td>
<td>$1,868</td>
</tr>
<tr>
<td>Year 2</td>
<td>$2,000</td>
<td>$1,600</td>
</tr>
<tr>
<td>Year 3</td>
<td>$1,600</td>
<td>$1,200</td>
</tr>
<tr>
<td>Year 4</td>
<td>$1,200</td>
<td>$800</td>
</tr>
<tr>
<td>Year 5</td>
<td>$800</td>
<td>$400</td>
</tr>
<tr>
<td>Year 6</td>
<td>$400</td>
<td>$00</td>
</tr>
</tbody>
</table>

Key:
- 85% $1,868
- Excludes GRC funded operational costs in 2011 and 2012
- $611
- $182
- $33 *

*Detailed review of workstream forecasts in progress.
4 Year Benefits

Total Meter Benefits by Year ($ Millions)

Key:
- **Current Plan**
- **Actual thru Sep ’10**

2011 - 2013 benefits mechanism will be determined in 2011 GRC

- **Year 1 to Dec-07**: $1.4
- **Year 2 2008**: $9.7
- **Year 3 2009**: $31.1
- **Year 4 2010**: $43.0

**Total Meter Benefits through 2010**
- $124.6
- $85.1
- $31.1
- $43.0
- $82.5