California’s Advanced Metering Infrastructure Initiatives

Energy Division
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Key energy policy drivers for California’s AMI initiatives

- Demand response is second in the Energy Action Plan’s “loading order” for meeting the State’s energy growing needs.
- The Commission’s demand response Megawatt goals (5% of system peak or approx. 2,500 MWs by 2007).
- Transforming California’s IOUs electric distribution network into an intelligent, integrated network enabled by modern information and control system technologies is one of the EAP goals.
In 2002 the Commission opened Rulemaking to further develop demand response and advanced metering policies

- The purpose of the Rulemaking was to develop demand response as a flexible resource to improve electric system reliability, reduce power purchase/individual costs, and protect the environment
- Commission adopted voluntary price responsive programs for large customers and demand response goals
- The Commission and CEC conducted a two-Year Statewide Pricing Pilot (SPP) to determine the demand response potential of residential and small C&I customers on time-differentiated rates
- Commission directed IOUs to file AMI project proposals along with cost/benefit analysis
Minimum regulatory requirements for approval of the AMI project proposals

1. The AMI systems were required to meet a minimum functional requirement criteria

2. AMI project proposals were required to be cost-effective

3. IOUs needed to provide a comprehensive plan for implementing their AMI projects- AMI deployment and system integration
Minimum AMI system functional requirement criteria

1. Capable of supporting various price responsive tariffs (CPP, TOU, RTP)
2. Capable of collecting energy usage data at a level that supports customer understanding of hourly usage patterns and their relation to energy costs
3. Capable of allowing access to personal energy usage data such that customer access frequency did not result in additional AMI system hardware costs
Minimum AMI system functional requirement criteria

4. Compatible with applications that provide customer education and energy management information, customized billing, and complaint resolution

5. Compatible with utility system applications that promote and enhance system operating efficiency and improve service reliability

6. Capable of interfacing with load control communication technology
The Commission approved PG&E’s AMI project in Summer 2006 with a budget of $1.74 billion

- PG&E selected Power Line Carrier technology for its electric meter network (5.1 million meters) and fixed radio frequency network for its 4.2 million gas meters
- Full AMI deployment is expected to take 5 years (fall 2006 through end of 2011)
- To date, PG&E has deployed approximately 230,000 meters (gas/electric)
- PG&E is required to monitor advances in relevant AMI technology and report back to the Commission semi-annually
In December 2007 PG&E filed a request for an additional $624 million in funding to upgrade its metering technology.

PG&E proposes to install new advanced meter technology with the following added functionality:

- An integrated load limiting connect/disconnect switch to remotely connect and disconnect customers' electricity, and also limit the amount of power that can be used at any given time;
- A Home Area Network (HAN) gateway device to link PG&E's AMI network to the customer's HAN; and
- Solid state meters with advanced micro-processing capabilities and memory to support the above functionality, and remote software and firmware upgradeability.
SDG&E’s AMI project was approved in the Spring of 2007

- The Commission determined that SDG&E’s AMI project met the minimum project approval criteria under the settlement agreement.
- The Commission approved a budget of $572 million for SDG&E’s AMI project - to install 1.4 million electric meters and 900,000 gas meter modules from 2008 through 2010.
- SDG&E is finalizing their contract agreements with meter vendors and communications providers.
- SDG&E’s AMI contracts are contingent upon Commission approval which is expected to occur in the first quarter of 2008.
SDG&E’s AMI project

- SDG&E was required to solicit proposals for a HAN communication interface, based on open standard capability for all customers
- SDG&E was directed to work with other major CA IOUs to strive for statewide commercially available open communication standards for HAN
- The Settlement required SDG&E to create an AMI Technology Advisory Panel (TAP) to ensure that SDG&E selects the best available technologies
Key issues in SDG&E’s AMI case

- Financial modeling methodology
- **Cost effectiveness**-
  - greater reliance on demand response benefits from residential customers (47%)
  - **HAN and remote connect/disconnect**
  - Cost/benefit analysis period
- Minimum functionality criteria (pending technology selection and approval)
SCE’s Advanced Integrated Meter Project

- In 2005, the Commission approved $12 million for phase I of SCE’s AIM project- to define its meter and systems requirements and determine whether the technology was commercially available.

- In August of 2006 SCE completed its feasibility study and determined that its proposed AMI solution is commercially available.
SCE’s Advanced Integrated Meter Project

- On July 26, 2007, the Commission approved $45.2 million for Phase II of SCE’s AMI project

- On July 31, 2007, SCE filed its Phase III application for full AMI deployment
  - SCE’s proposal entails installing 5.3 million meters over five-year period starting in 2009 for every household and business under 200kW
  - SCE’s estimated project costs are $1.7 billion and $2.08 billion in estimated benefits
  - A Commission decision in the case is expected by mid-August of 2008
Other key issues

- Home Area Network (HAN) inter-phase and energy information and control technologies communication standards
- Legislative restrictions associated with the development of price-responsive tariffs for residential customers
- Ensuring that the projected AMI benefits are achieved and that projects are implemented within budget
- AMI system security
- AMI system performance over the life of the system (20 years)
SPP highlights and findings

- SPP involved a representative sample of approximately 2,500 residential and small C&I customers on experimental time-differentiated rates (TOU, CPP-F, CPP-V)
- Residential customers on CPP-F rate on average reduced their peak-energy use by 13.1% (range 7.6-15.8%)
- The results for residential customers on TOU rates were inconclusive
- Residential customers on CPP-V rate with central A/C, high electricity usage, and enabling technology on-peak energy reductions ranged from 16-27%