

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 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 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%**