Session 1B

DEMAND RESPONSE

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SESSION SUMMARY:

This session looks at a variety of demand response programs for residential and commercial customers. A variety of approaches have been used to evaluate the impact of these programs. A summary of specific methodologies for each are provided in the summaries below.

Paper 1

PG&E operates both a critical peak pricing (CPP) program, SmartRate, and a direct load control (DLC) program, SmartAC, for residential customers during the summer. SmartAC had over 145,000 residential customers at the end of the summer of 2011 while SmartRate had about 23,000 customers. Customers are not limited to being on one program or the other; there were 4,700 customers who were enrolled in both SmartRate and SmartAC during the summer of 2011. This paper explores how the impacts differ among customers that are (1) only enrolled on SmartRate, (2) only enrolled on SmartAC, and (3) dually-enrolled on SmartAC and SmartRate.

SmartRate is a dynamic rate that overlays other available tariffs. SmartRate has a high price during the peak period up to 15 event days per year referred to as Smart Days, and slightly lower prices at all other times during the summer. The SmartAC is a DLC program that involves the installation of programmable communicating thermostats or load control switches at households with central air conditioning (CAC). Events can be called from May to October and can last up to six hours. For customers enrolled in both SmartAC and SmartRate, CAC control devices activate for both SmartRate and SmartAC event days.

Paper 2

This paper summarizes the results of an impact evaluation of one of the first peak time rebate (PTR) programs in the United States in which all residential customers are enrolled and eligible to receive bill credits by default. In 2012, SDG&E enrolled all of its residential customers (all of whom have received Smart Meters) in

PTR. SDG&E arranged for day-ahead public announcements (e.g., through radio and TV news, and weather features) of PTR event days (which are also referred to as "Reduce Your Use" days), and all customers have the opportunity to earn bill credits for usage reductions during event hours. Customers are also encouraged to sign up to receive electronic notification, or alerts, of events through email or text messages (or both).

The primary objective of the evaluation described here was to estimate hourly PTR event-day load impacts at the program level and for various subsets of customers. Among these subsets were: 1) those who requested electronic notification, or alerts; 2) customers located in the city of San Diego who enrolled in the San Diego Energy Challenge (SDEC), a separate effort within PTR that involved a competition among middle schools in the San Diego Unified School District; and 3) those who registered for an online My Account.

Paper 3

This report presents energy impact estimates for the 10/10 Program, which SCE offered to customers in summer 2012 in an effort to mitigate the potential for local power outages as a result of the closure of the San Onofre Nuclear Generating Station (SONGS). Under this program, if an eligible non-residential customer in Orange County reduced summer usage by 10 percent or more relative to usage in summer 2011, the customer received a 10 percent bill credit for that time period. The primary evaluation objective is to estimate the energy savings attributable to the 10/10 Program. Considering that many customers may have responded to 10/10 without fully achieving a usage reduction of 10 percent or more, the energy impact of the 10/10 Program is not limited to customers who received a rebate. Therefore, this evaluation estimates the impact of 10/10 on all eligible non-residential customers in Orange County. This approach required the development of a counterfactual—what usage would have been without the 10/10 Program—for the approximately 107,500 service accounts that were eligible for 10/10 rebates. A quasi-experimental approach was employed to develop this counterfactual, using selected SCE customers outside of Orange County as a matched control group.

Paper 4

Aggregator programs with a focus on commercial and industrial (C&I) customers are wide spread across North America. According to FERC's 2012 *Assessment of Demand Response and Advanced Metering*, reported C&I demand reduction capability exceed 27,000 MW, much of which is delivered through aggregators which either directly participate in wholesale electricity markets or contract with utilities (FERC 2012).

This paper presents the analysis of the performance of OPA's aggregator programs for 44 events over five years and allows us to explore the reliability of aggregator programs and variability in response patterns based on industry type, customer size and other factors. We also compare performance based on both settlement baselines and evaluation results. The current baseline method for the OPA's aggregator program has been shown to be biased and, in aggregate, overstates demand reductions by approximately 20 to 25 percent. Despite the settlement baseline bias, performance relative to settlement baselines is important since it is the metric by which aggregators are compensated.

There are three main aspects to aggregator performance: the ability to build DR resources, the ability to ensure the resources remain available, and the ability to deliver expected DR resources. Once DR resources are built, the key question is how reliably they perform relative to the reductions expected by operators. Reliability includes two components: pre-announced non-performance, typically due to facility maintenance of large electricity customers; and deviations between DR resources scheduled and delivered during actual activations. These differences can be attributed to shortfalls or over delivery by aggregators, or structural flaws such as bias in the settlement baselines.