The California Resource Adequacy Program: Achieving Reliability and Economic Efficiency through Virtual Re-bundling of Generation and Distribution

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I. Background

The devastating consequences of the California energy crisis highlighted several fundamental flaws in the California electricity market design and some of the policies adopted by the CPUC in deregulating the California electricity market. Many commentators have identified the lack of long term contracting between the unbundled generation and distribution sectors and the over reliance on spot market transactions as major causes for the market meltdown and an impediment to system reliability. To remedy these shortcomings, the California ISO and the CPUC have initiated a market redesign initiative in 2002 and the CPUC following up on this initiative, committed to creating a resource adequacy program for the state. The objective of this program was to support the system reliability objectives of the CAISO while improving the economic efficiency and assuring reasonable prices for the California consumers.

The Resource Adequacy (RA) program accomplishes these goals by mandating long term contracting and procurement of generation capacity by the CPUC jurisdictional load serving entities. By coordinating these contracting requirements with the CAISO local reliability criteria, the CPUC hopes to reduce the CAISO reliance on costly Reliability Must Run (RMR) contracts that are expansive and hinder economic efficiency in the market. At the same time the long term contracts protect customers against price excursions during shortage conditions (as seen during the California energy crisis) and encourage investment in new generation. Considering the fact that the RA program supports long term contracts of up to 20 years as well as construction of new generation facilities by the regulated investor owned utilities, it may be viewed as virtual rebundling of the generation and distribution sectors.

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The opinions and analysis presented in this paper are those of the authors and do not represent the position of the CPUC.

II. Putting Humpty Dumpty Back Together

The foundation for the RA program was established by the CPUC in orders D.04-01-050 and subsequently in order D.04-01-035 issued in Spring of 2004. In September 2005, the California Legislature enacted Assembly Bill (A.B.) 380, which required the CPUC, in consultation with the CAISO, to establish Resource Adequacy Requirements (RAR) for all the LSEs under the CPUC jurisdiction.

The initial CPUC Resource Adequacy Order D.04-01-050 and D.04-10-035 issued in 2004 established the LSE obligation framework, established qualifying capacity rules and authorized a wide range of resource types. In a subsequent order in D.05-10-035 issued in 2005, the CPUC clarified the notion of monthly capacity versus peak load, established required elements for standardized contracts and clarified the availability obligation to the CAISO of contracted generators. In 2006 the CPUC issued another order D.06-07-031 that resolved a number of regulatory uncertainties including, treatment of forced outages vs. scheduled outages, title clearing, creditworthiness and the role of intermediaries.

The order also modified the required elements of tradable, standardized capacity contracts and authorized trading via bulletin boards or exchanges. The short term RAR imposed on the LSEs are based on load forecasts developed by the California Energy Commission (CEC) and on local reliability needs determined by the CAISO. The contract portfolios of the LSEs are subject to compliance verification by the CPUC. In August 2006 the CPUC launched a proceeding aimed at determining whether there is a need for a centralized capacity market that will supplement or replace the current contract-based resource adequacy approach.

III. Short Term RAR

The primary purpose of the short term RAR is to address local resource adequacy requirements by ensuring that sufficient local generation capacity is contracted and available to the CAISO to meet CAISO's local reliability need in load pockets and to reduce the dependency on RMR contracts. The program is adjusted and applied annually as follows:

- The CAISO performs local capacity requirement (LCR) study a year ahead of the CPUC program adjustments

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- Key LCR study inputs include load forecasts by the California Energy Commission (CEC), transmission system configuration, generation expansion plans, import capability, the status of all "must take" units, maintenance of path flows, NERC performance level criteria. Load pocket modeling is based on transmission constraints and import effectiveness.
- CAISO's LCR for each load pocket will include non-generation resources, such as operational responses, short term equipment upgrades rating reevaluation and demand response.
- CAISO provides several LCR level based on reliability levels (N-1, N-2, etc.). Use of probabilistic criteria for LCR studies is being planned
- The CPUC Energy Division translates the LCR results to CPUC-jurisdictional LSE Local RAR and calculates along with the CEC local RAR for each LSE. The calculation is based on the requirement that each LSE covers 115-117% of their peak load share in each local reliability area (some aggregation of local reliability areas was done to improve market liquidity)
- The CPUC Energy Division monitors the compliance of the LSE resource portfolios for the coming year with the RAR and these are subsequently reviewed by the CAISO who has authority to procure backstop RMR resources that are needed to complement the RAR resources.
- The CAISO's backstop procurement role addresses both reliability needs and market power mitigation by exempting the LSE from RAR procurement if no capacity offers below $40/kw/year are available.

IV. Long Term Procurement

In a 2004 long-term procurement Decision D. 04-04-003 the CPUC directed all the LSEs to follow the state mandated "loading order" contained in the California's Joint Agency Energy Action Plan (EAP) by prioritizing energy efficiency, demand-side resources, and Renewable Portfolio Standards goal in their procurement plan. Recently the second phase of the long term procurement program was addressed in a July 21, 2006 decision by the CPUC. The program recognizes that the short term RAR program may not be able to provide sufficient generation investment incentives unless at least part of the short term RAR is met with long term contracts. The provisions adopted in this decision are on a limited and transitional basis, do not apply to utility owned generation and are limited to new and repowered generation.

The decision designates the IOUs as the entity responsible for procuring new generation for the system and divides the management of the energy and capacity components of resources procured under this program. It determines that the IOUs are not responsible for management of the energy component of new generation and requires that the value of that energy component be revealed through an auction mechanism for long term tolling rights to the energy. The capacity cost determined as the total contract cost net of the energy value revealed through the auction will be allocated to all LSEs within the IOU service territory.

The cost allocation methodology adopted in this decision is for up to ten years but LSEs that can prove to be resource adequate "over sufficiently long time" can opt out of the cost allocation provisions.

V. Centralized Capacity Market

One of the problems with the current RAR program is the heavy burden associated with CPUC oversight over annual compliance. Furthermore, the current programs co-mingle the risk management objective of assuring LSE customers energy supply at reasonable prices with the local reliability objectives of the CAISO. From a risk management perspective it is optimal to procure long term contracts that cover 100% of the peak load. Such procurement amounts to over insurance and increases the cost of electricity to consumers. However, from a reliability perspective it is essential to have sufficient resources for energy supply and reserves base on peak loads.
A centralized capacity market for trading capacity products or backstop call options can complement a system of RAR aimed to assure adequate price risk mitigation for LSE customers.
The need for a centralized capacity market to replace or complement the current RAR program will be addressed in an ongoing CPUC proceeding that was launched in August 2006 and which will address "Phase 2" issues concerning resource adequacy in California. At the time of this writing there are two major camps one arguing for establishing a centralized capacity market similar to the ones in the North Eastern RTOs while the opposing group favors continuation of the bilateral RAR approach with some improvement to a bulletin board type trading of capacity among the market participants.

VI. Biographies

Bishu Chatterjee is a Senior Economist with the California Public Utilities Commission, San Francisco and Adjunct Instructor with the Energy Management Institute, New York. He has over 15 years of experience working with government, academia, and as a consultant. He holds a Ph.D in Resource Economics from the University of California, Davis.

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