

**Draft- Prepared by the CPUC  
For Discussion by the Vision for Demand Resources Working Group**

## **California Demand Response: A Vision for the Future**

Proposed joint statement by the staff of the California Energy Commission, California Public Utilities Commission, and California Independent System Operator, Inc.

### **Introduction**

The CPUC, CEC, CAISO and stakeholders created five working groups as a collaborative effort to advance demand response and enable greater participation from demand resources in the wholesale power markets. The CPUC is the lead agency for the Vision for Demand Resources working group and has published this paper for comment and discussion by the working group. For additional information on the demand response working groups, please visit the CAISO's Demand Response Initiative web page found at: <http://www.caiso.com/1893/1893e350393b0.html>

### **Vision Statement**

All California electricity consumers have the opportunity and capability to adjust their usage in response to time-varying signals reflecting economic, reliability or environmental conditions.

### **Definition**

DEMAND RESPONSE allows end-use electric customers to reduce their electricity usage in a given time period, or shift that usage to another time period, in response to a price signal, a financial incentive, an environmental condition or a reliability signal.

Demand Response Provider/Curtailment Service Providers may sponsor demand response programs and sell the demand response load to utilities and/or the CAISO, but are not necessarily load-serving entities. A Demand Response Provider may also aggregate demand and bid demand reductions or act as an agent on behalf of retail customers to the CAISO or contracts with the utilities, LSEs, ESPs, SCs, *etc.*, to aggregate retail customer load as part of a demand response program.

### **Objectives**

#### ***Enhance Infrastructure and Reliability***

- Numerous and diverse customers voluntarily reducing or shifting their demand in response to economic signals is preferable to controlled outages during power system emergency situations
- Timely demand response (within seconds, minutes or hours) from customers can defer the need for investment in generation, transmission, and/or distribution

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- Cost-effective demand response should be used in resource planning, procurement planning, and help satisfy operating reserve requirements
- Demand response can be used to maintain grid and market reliability, ease delivery constraints, used on a locational or regional basis to improve system reliability, meet emergency system needs and reduce electricity costs.
- Demand response can provide a market for renewables to meet load that has been shifted to off-peak when some intermittent renewable resources are more coincident.
- Technologies to enable demand response may also provide other customer service benefits including outage detection and management, power quality management, increased energy efficiency and other information capabilities

#### *Manage Electricity Costs*

- Demand response can give customers an opportunity to reduce their energy costs by adjusting their usage in response to time variant retail prices
- Customers should have the opportunity to benefit from providing demand response
- Demand response tariffs dynamically incorporate the cost of providing electricity service, thereby encouraging consumers to adjust their usage and lowering overall wholesale electricity costs for all customers
- Timely demand response can help mitigate wholesale market power and ensure reasonable prices
- To encourage demand response, LSEs should design and offer retail rates that dynamically incorporate the marginal cost of providing electricity service
- Demand response activities and infrastructure should be designed to be cost-effective from a societal perspective

#### *Reduce the Environmental Impact Caused by Electricity Usage*

- Demand response can reduce consumer electricity usage during peak periods when the least efficient generation units would be operating, thereby reducing greenhouse gas and other air emissions
- Demand response via permanent load shifting can help integrate intermittent, non-peak time, renewable resources into the electric grid
- The agencies' definition of demand response does not include or encourage switching to use of fossil-fueled emergency backup generation

### Goals and Principles

#### *Consumer Education and Customer-Oriented Design*

- Electric consumers in California should be made aware of the time-variable nature of electricity costs and of general steps they can take to help lower those costs
- All customers that desire it should be able to easily access their information about their own electricity use with the option for hourly or more frequent information and with the option to share their information with a demand response provider, of their choosing
- Demand response should be designed to be customer-friendly, simple, and easy to understand

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***Ability to Participate in Dynamic Pricing and Dispatchable Programs***

- Dynamic pricing tariffs should be made available for all customers, thereby allowing customers to manage their usage in response to appropriate price signals
- All customers should also have the option to participate voluntarily in demand response where they can provide demand reductions as a dispatchable resource, including:
  1. In ISO markets: real-time, day ahead, day-of, emergency, and ancillary services
  2. In retail markets: utility programs including direct load control, controllable thermostats, and other demand response automatically communicating systems that are based on an open communications architecture and support residential, commercial and/or industrial consumers' ability to provide load reductions

***Technologies and Infrastructure***

- All customers should be provided cost-effective advanced metering systems capable of supporting time varying tariffs with metering done on an hourly basis or better, and with minimal hardware upgrades necessary to participate in various dynamic pricing tariffs
- Any advanced metering systems should support the ability to automatically retrieve data information and provide the customer with timely access to this retrieved data
- All residential customers should be enabled through communications media interfaces to remotely control devices in their home area network<sup>1</sup> and manage their energy usage. Furthermore, customers who choose to should be able to conveniently access their usage information using communications media (*e.g.*, over the internet, via on-site devices, or other means chosen by the customer)
- The broadest possible range of metering and communications technologies, that are compatible with Title 24 devices, which can enable demand response should be encouraged, provided that all technologies should be compatible with utility billing and other back-office systems
- Advanced metering infrastructure, automated demand response and direct load control should be encouraged to provide customers with the opportunity to reduce usage with minimal intrusion and effort. Proliferation of user friendly technologies will have beneficial effects on grid reliability and operation
- The use of a smart grid allows for greater implementation of demand response. Smart grid technologies provide real-time information on the transmission and the distribution level that can enable efficient use of demand response resources, offset grid enhancements, increase the visibility of customer usage to ISO, LSE and ESPs and overall grid stability

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<sup>1</sup> A home area network is a network contained within a user's home that connects a person's digital devices, from multiple computers and their peripheral devices to telephones, home entertainment units, home security systems, smart appliances and other digital devices that are wired into the network.

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- State building code (Title 24) updates provide a cost-effective opportunity to introduce demand response technologies during the construction of new buildings or renovation of existing buildings

***Demand Response in the Wholesale Market***

- Market rules, including technical and operational standards, should not limit the ability for demand to bid directly into the wholesale market, including into capacity, ancillary services and energy markets
- Market rules should allow for small load to be aggregated and bid into the wholesale market
- Load serving entities and demand response providers should be able to freely participate and compete directly in the wholesale market
- Demand response providers should have access to customer data, with appropriate confidentiality protection, to enable the development and implementation of demand response products that meet customer needs
- Demand response should be treated as a resource for planning and procurement purposes
- Demand response participants should be given appropriately aligned wholesale market pricing signals, which incorporate locational marginal prices
- The demand response market shall be appropriately structured to ensure competitive participation while protecting California's ratepayers

***Investor-Owned Utility (IOU) Issues***

- IOUs should incorporate demand response resources into their overall procurement portfolio and as a portion of their reserve requirements
- IOUs should treat demand response resources similar to other resources in their procurement portfolio when considering a mix of resources necessary to satisfy their load-serving obligation
- All IOU demand response efforts should be periodically evaluated to determine past performance and improve future effectiveness
- IOUs should competitively procure demand response resources in an open and competitive demand response market

***Coordination between CPUC, CEC and CAISO***

- Effective demand response efforts will require coordination among the agencies promulgating this vision statement
- The CAISO will follow FERC Order 890 in coordinating transmission planning as it relates to considering demand response resources
- Coordination will also be necessary related to:
  - IOU procurement planning
  - IOU rate design modifications, either in general rate cases, or separate venues
  - Energy efficiency (and other public purpose) programs
  - Other peak demand reduction programs

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- ISO efforts to develop transparent wholesale market pricing mechanisms
- Changes to ISO market rules to allow additional participation by non-IOU demand response providers
- Necessary legislative changes to rationalize rate design structures

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