

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to Consider Smart Grid Technologies Pursuant to Federal Legislation and on the Commission's Own Motion to Actively Guide Policy in California's Development of a Smart Grid System.

Rulemaking 08-12-009

Filed December 18, 2008

**Comments of the California Independent System Operator Corporation  
in Response to Assigned Commissioner and Administrative Law Judge's Joint  
Ruling Amending Scoping Memo and Inviting Comments on Proposed Policies  
and Findings Pertaining to the Smart Grid**

The California Independent System Operator Corporation (the ISO) supports the CPUC and its efforts to fulfill the obligations specified in SB 17. The ISO is largely aligned with the CPUC's eight requirements that define a smart grid. The eight requirements are that a smart grid must: (1) be self-healing and resilient; (2) motivate consumers to participate in grid operations; (3) resist both man-made attacks and natural disruptions; (4) provide higher quality power that saves consumers money; (5) accommodate all storage and generation options; (6) enable electricity markets to flourish; (7) run more efficiently; and (8) enable the wide deployment of intermittent sources of power.

Like the CPUC, the ISO has set forth three (3) objectives for the smart grid that encompass most, if not all, of the CPUC's eight requirements. The ISO's three smart grid objectives are to:

1. Enhance the reliability and efficient use of the grid.
2. Increase participation in ISO markets from demand-side and other distributed energy resources.

3. Enable the integration of greater amounts of intermittent renewable resources.

Overarching the ISO's three smart grid objectives is a robust approach to physical and cyber security that not only protects grid infrastructure but secures the information and communication flows that support its reliable operation.

The ISO continues to support the CPUC in the development of smart grid policies that are tailored for California's unique circumstances, yet are also aligned with national standards currently under development. Consistent with the timeframe established by the Assigned Commissioner and Administrative Law Judge in their February 8, 2010 Ruling and Article 6 of the Commission's Rules of Practice and Procedure, the ISO offers these comments on specific issues raised in the Ruling.

**I. The ISO Supports Standards Identified by the Ruling for Review of Smart Grid Deployment Plans**

In their Ruling, the Assigned Commissioner and Assigned Administrative Law Judge articulate a set of standards for reviewing utility smart grid deployment plans. The Ruling proposes criteria to assess utility smart grid deployment plans. The Ruling also recommends that utilities identify the current state of their electric systems, provide a timeline for smart grid deployment, identify what that deployment will require, and provide an estimate of the necessary financial investment. The ISO generally supports the direction set forth in the Ruling.

The ISO intends to participate in the Commission's upcoming workshops to provide an overview of its smart grid goals for its wholesale market and the transmission system under its operation control. The ISO hopes its participation and input will be useful to the utilities in preparing their smart grid deployment plans consistent with the Ruling. The ISO's smart grid goals and initiatives are focused on accomplishing the objectives and goals stated above, and as further detailed below.

A. Enhancing the Reliability and Efficient Use of the Grid

Achievement of high standards for grid reliability requires fast and accurate data and information exchanges across all levels of the electric system. An important smart grid strategy is the investment in the high speed Synchrophasor data network that provides critical voltage and current operating information from key generating facilities and transmission substations throughout the Western Power Grid. This data, along with new display and analysis tools, provides “wide situational awareness” of the power grid. Such awareness can help insure the system is being operated within safe margins and may also enable dynamic path flow ratings. Dynamic ratings would allow more energy to flow at certain times and under certain conditions, increasing the efficient use of the grid.

Smart grid strategies and technologies should also provide greater visibility of the loads and resources that are distributed in the lower voltage sub-transmission systems. Such visibility provides critical “deep situational awareness,” which is needed to manage a growing number of distributed energy resources, such as solar photovoltaic generation and demand-side resources. For instance, as the number of distributed resources increases, the ISO must be able to observe that sufficient energy and reserves are available from these types of resources to maintain applicable reliability requirements. Finally, tools to improve the forecasting of local loads and resources can help lower energy costs by enabling a more efficient and flexible dispatch and commitment of resources.

B. Increasing Demand-side Participation in the ISO’s Markets

Technologies exist today that allow customers to control their energy consumption and costs, and that enable the visibility over, and control of, resources at the sub-transmission level. The utility deployment plans should outline a way

forward to increase acceptance, deployment, and integration of “load management” strategies and other enabling technologies, like Auto-DR, that enable load, for example, to be configured to react to dynamic prices. Doing so would create a more favorable system load shape or enable loads and other distributed energy resource to participate directly in ISO energy and ancillary service markets. Customer education, evolving rate structures, and infrastructure development are all important components that will enable a more favorable load shape to evolve and will help increase the participation of non-generation resources in the ISO’s markets.

The ISO and its stakeholders are working collaboratively to develop the wholesale products and standards that will enable non-generation resources, like demand response, to participate in the wholesale market. The ISO will implement its Proxy Demand Resource product in May 2010 and refinements to the ISO’s Participating Load product are scheduled to be implemented in February 2011.

C. Integrating Greater Amounts of Intermittent Renewable Resources

Smart grid systems will facilitate the interconnection of higher quantities of renewable generation at all levels of the grid. Innovative storage devices represent a category of smart grid technologies with profound promise to help achieve California’s renewable resource and greenhouse gas emission targets. Not only will such resources offer an opportunity to better shape renewable production to match load, but they offer a potential means to mitigate the added variability and uncertainty injected into grid operations by increased renewable resources. Moreover, intelligent agents can potentially assist the ISO to efficiently utilize transmission capability to maximize renewable resource output. For instance, wind generation resources only infrequently hit their maximum production capability such that they can deliver some energy on existing transmission lines if a means exists to

automatically control the output of the wind generators to match the available transmission capacity on a real-time basis. Intelligent agent technology allows for the communication among adjacent substations to assess transmission voltage and line loading limitations, and control local energy storage resources with the objective of delivering every MWH of green energy possible while staying within mandatory transmission limitations.

At the distribution level, smart grid technologies should make the system robust enough to maintain power quality and acceptable voltages given the potential intermittency of certain renewable resources interconnected on the distribution circuits. Smart substations should be configured to monitor the loads and resources in the local area and provide both real-time data and potential short-term energy forecasts for that area. This local “visibility” should enable the ISO to assure there is adequate transmission capacity and generation reserves to meet the energy needs of the local area.

D. Enhancing Cyber Security to Secure Information and Communication Flows

The foundation of the smart grid is the ability to exchange information across all levels of the electric system quickly, accurately, and in a secure environment; myriad components and systems making up the electric system must efficiently communicate with one another. Given the need for so many different systems and devices to communicate with each other, national standards are imperative. Given the critical role that national standards will play in the successful development and deployment of the smart grid, the ISO is participating actively on national standards committees such as the North American Energy Standards Board (NAESB), the Organization for the Advancement of Structured Information Standards (OASIS), and National Institute of Standards and Technology (NIST). The ISO believes that the

development of national standards and open communication protocols will encourage the maximum participation by technology vendors and should encourage greater acceptance by energy service providers and consumers.

**II. Access to Pricing Information and Usage Data are Fundamental to the Commission's Policies**

The ISO continues to support customer access to wholesale electricity pricing information as a means for customers to better manage energy use. The Commission should promote greater transparency of wholesale prices and how a customer's usage correlates with those prices from a temporal and locational perspective. This policy should encourage greater demand response. To this end, the ISO's December 7, 2009 comments in this proceeding ask that the Commission consider providing customers with some level of wholesale price information as the Commission proceeds to develop smart grid policies that may drive infrastructure and other investments. The ISO recognizes that educating end-use consumers about the time variable nature and locational aspect of wholesale electricity prices is an issue that requires further discussion and a thoughtful approach. The ISO looks forward to participating in that discussion.

**III. The ISO Does Not Recommend the Adoption of Prescriptive Standards Related to the Use of Electric Vehicles**

In their Ruling, the Assigned Commissioner and Assigned Administrative Law Judge solicit comments on the adoption of standards related to the use of electric vehicles by customers. At this time, the ISO does not believe it is necessary to adopt prescriptive standards on the use of electric vehicles by customers. Although there may be initial projections of electric vehicle use in California on a wide scale, this use has yet to develop and it is unclear what standard, if any, should apply to this use. In addition, the standards that require specific infrastructure may have the

unintended consequence of limiting market opportunities and effectiveness. The ISO envisions that customers that operate fleets of electric vehicles may well have the capability to aggregate those resources in order to participate in the ISO's competitive wholesale market. As an alternative to the adoption of specific standards for the use of electric vehicles, it may be preferable to allow programs to develop based on actual customer use. In the interim, the Commission may wish to consider a policy preference for standards that create incentives to shift electricity use necessary to charge electric vehicles away from peak periods. One possible approach is to create retail rates specifically for charging electric vehicles during off-peak periods.

#### **IV. The ISO Encourages the Use of Smart Grid Policies to Facilitate the Deployment of Advanced Storage Devices**

In their Ruling, the Assigned Commissioner and Assigned Administrative Law Judge solicit comments on how the Commission should evaluate storage proposals, including smart grid deployment plans, and what steps the Commission should take to ensure communications services needed to use storage technologies are available within the grid. The ISO believes the Commission should encourage the deployment of storage devices and not impose limitations on how utilities pursue storage opportunities. The ISO has already started to develop mechanisms to encourage greater participation of storage devices in the ISO's wholesale market.<sup>1</sup> For these resources, the ISO has established communication protocols. The ISO encourages the Commission to examine communications protocols for storage devices at the distribution level that are compatible with flexible market structures and resource functions. Any protocols considered by the Commission should

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<sup>1</sup> See, e.g., Letter Agreement for Bidding of Regulation Ancillary Service by Sano Regulation Center and Request for Waivers, FERC Docket No. ER10-660-000 (Jan. 27, 2010).

support an open network and not create limitations on the ISO's visibility of storage devices, including those devices' state of charge or ability to consume or generate electricity.

**V. The ISO has Established Security Protocols for Participation in its Wholesale Markets and to Operate the Transmission Network**

In their Ruling, the Assigned Commissioner and Assigned Administrative Law Judge solicit comments on how smart grid proposals funded in California provide for security of the network. For resources participating in the ISO's wholesale market as well as for operation of the transmission system, the ISO maintains a secure network in accordance with applicable regulations of the North American Electric Reliability Corporation. The ISO's standards are available to all whom wish to participate in the ISO market.<sup>2</sup>

**VI. Conclusion**

The ISO is undertaking a number of initiatives designed to leverage smart grid policies in order to enhance grid reliability, increase participation in ISO markets, develop robust cyber security, and support renewable resource integration. These initiatives complement the smart grid policies established by the Commission and should inform the development of utility smart grid deployment plans.

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<sup>2</sup> The ISO's information security standards are available on the ISO's website at: <http://www.caiso.com/271f/271fcbd45ca60.html>.

The ISO appreciates the opportunity to offer these observations and looks forward to continuing its participation in the CPUC's smart grid policymaking process.

Respectfully submitted,

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Dated: March 9, 2010

**CERTIFICATE OF SERVICE**

I hereby certify that on March 9, 2010 I served, on the Service List for Proceeding R.08-12-009, by electronic mail, a copy of the foregoing:

**Comments of the California Independent System Operator Corporation  
in Response to Assigned Commissioner and Administrative Law Judge's Joint  
Ruling Amending Scoping Memo and Inviting Comments on Proposed Policies  
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Executed on March 9, 2010 at Folsom, California.

**/s/ Jane Ostapovich**

Jane Ostapovich,  
An employee of the California Independent  
System Operator