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The Western Energy Imbalance Market

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The new Western Energy Imbalance Market produced over \$21 million in benefits over its first eight months of operation (from November 2014 – June 2015). And potential savings from increased regional cooperation are many times greater—in the hundreds of millions of dollars by 2024, analysts estimate. In Monday’s Energy Policy Seminar, Dr. Keith Casey of the California Independent System Operator (CAISO) explained how integrating electricity markets across state lines has the potential to play an important role in leveraging renewable energy on the grid.

The stage for the Energy Imbalance Market was set, Casey explained, by California’s ambitious renewable energy goals—including a Renewable Portfolio Standard of 33% by 2020 and 50% by 2030. Current projections forecast that most of the required new renewable energy will come from solar pv, with the result that peak renewable energy production will occur during the daylight hours. Given current projections of usage patterns and the need to continuously run certain baseload generation units, as its renewable portfolio grows to 40% and 50%, California is projected to face a problem of over-generation of energy during a number of hours in the middle of the day, along with integration challenges associated with providing a steady power supply through solar power’s steep ramp up as the sun rises and ramp down as the sun sets.



Among a number of different approaches to the problem of over-generation (storage, demand response, time-of-use rates, etc.), Casey focused on the potential benefits of greater regional electricity market coordination, beginning with the foundation of the western Energy Imbalance Market (EIM) in 2014.

In “restructured” parts of the country, wholesale electricity markets are organized by non-profit organizations called “system operators,” which pursue lowest-cost electricity dispatch within the constraints of keeping the electric grid stable. Traditionally, system operators like CAISO run an electricity market tailored to consumption and production by entities within the system operator’s territory. It is possible to import and export electricity, but the process is relatively slow, inefficient, and difficult to optimize.

CAISO has until recently operated a system tailored to dispatching energy within California, as the boundaries of the state closely (though imperfectly) match the ISO boundaries. Beginning in the fall of 2014, however, CAISO and PacifiCorp (utility for much of Utah and for portions of Wyoming, Idaho, northern California, Oregon, and Washington) have begun a new experiment—operation of a coordinated “Energy Imbalance Market” (EIM) that adapts the system operator dispatch process to accommodate more direct and efficient dispatch of energy between these two systems. As mentioned above, in its first months of operation, the EIM has resulted in millions of dollars in savings, and it has attracted interest from a number of other utilities in the West, including NV Energy, Arizona Public Service, and Puget Sound Energy, all of which have made public plans to enter the EIM in the next two years.

Such increased regional integration makes it easier for California to both export its excess renewable energy and, in future, perhaps to take advantage of renewable resources elsewhere, such as the considerable wind energy potential of Wyoming. Plans for even greater integration are under consideration—it is possible the western United States is moving

in the direction of something closer to a single system operator for the whole region, Casey explained, which would greatly increase the ability of the Western U.S. to efficiently leverage renewable energy resources.

Casey spoke as part of the Kennedy School's Energy Policy Seminar Series, which is jointly sponsored by the Energy Technology Innovation Policy research group of the Belfer Center and by the Consortium for Energy Policy Research of the Mossavar-Rahmani Center on Business and Government.