

Modernizing the Electricity Grid

2017-2019 MILESTONES

The California Independent System Operator (ISO) manages the flow of electricity across the high-voltage, long-distance power lines that make up 80 percent of the California's grid and a small part of Nevada. The ISO also manages the Western Energy Imbalance Market (EIM), a real-time electricity market with participants serving customers in eight western states. As a nonprofit, public benefit corporation, the ISO's top priority is to operate the grid in the most reliable manner possible. This document outlines some of the ISO's significant accomplishments in meeting its long-term goals approved in 2017 by its Board of Governors.

Maintaining and improving grid reliability

Improving grid technology – The ISO operates the most advanced grid technology in the industry. The new energy management system, launched in late 2019 after five years of research and design, improves power flow accuracy, supports market enhancements, and allows for broader renewable energy integration.

Established Reliability Coordinator services for the West – On Nov. 1, 2019, the ISO's RC West became the Reliability Coordinator of record for 41 entities across 14 states and northern Mexico. RC West has oversight of power grid reliability for balancing authorities and transmission operators in the Western Interconnection, monitoring compliance for 87 percent of the load in the western US. The launch followed nearly two years of public workshops, planning and implementation, and certifications from North American Electric Reliability Corporation and Western Electricity Coordinating Council.

Assessing new transmission projects – As part of its annual transmission planning process, the ISO identified opportunities to address reliability needs and reduce new transmission infrastructure. In the 2017-18 transmission planning process, the ISO recommended canceling 20 projects, and reducing the scope on another 21 projects, saving more than \$2.6 billion. Another six projects were eliminated in the 2018-2019 planning cycle, saving \$440-\$550 million in costs. The reductions were mainly due to changes in local area load forecasts, and strongly influenced by energy efficiency programs and increasing levels of residential, rooftop solar generation.



Since 2017 the transmission planning process identified more than
\$3 billion
in savings

Created permanent market mechanisms to improve coordination of electric and natural gas supplies – The ISO developed market mechanisms and operational tools that strengthen coordination of natural gas supply and electric coordination following the October 2015 outage of Aliso Canyon storage facility.

Reliability must-run procurement – To ensure that critical resources are always available to serve demand, the ISO in 2018 updated the compensation methodology for reliability must-run designations and set clear rules for their use.



Leading the transition to a low-carbon electricity grid

Efficiently managing large amounts of variable resources requires new operating paradigms. The ISO has successfully integrated higher amounts of renewable resources while maintaining system reliability.

Unlocking grid services from renewable resources – After years of relying on conventional resources to provide essential grid reliability services, the ISO conducted groundbreaking tests that would allow for renewable energy resources to provide required services to support a reliable grid. If renewable resources can consistently perform these functions, the grid will have decreased reliance on conventional, less clean resources.

Enhancing Distributed Energy Resources – Another significant effort towards greening the grid involves enhancing market participation of distributed energy resources, which are resources such as energy storage, plug-in electric vehicle applications, demand response programs located on local distribution systems. The ISO implemented initiatives to evaluate performance, limitations, and the role of storage resources, and created load shift products such as “dispatchable consumption” and electric vehicle participation. Later this year, the ISO plans to explore further refinements and improve integration of these resources.

Expansion with transparency

Expanding clean energy resources to local communities – The ISO is coordinating with cities and counties focused on supplying their own set of resources within their communities. This effort involved educating Community Choice Aggregators (CCA) on how to function as a load serving entity under the ISO rules, integrating renewables, understanding operational needs, resource adequacy reform, and procurement practices.

Western EIM success – The Western EIM has achieved \$861.8 million in economic benefits and reduced greenhouse gas emissions by 433,120 metric tons since the market’s launch in November 2014. The Western EIM allows economic transfers of energy among participating entities and enables greater integration of renewables by using a larger geographic footprint to balance conditions. Since its launch, the Western EIM has experienced steady growth, increasing to 20 entities either participating or preparing to enter. In 2019, the Balancing Authority of Northern California became the eighth active participant, with 12 other entities preparing to join over the next three years in eight states. The ISO is pursuing extending participation in the day-ahead market to the Western EIM entities to improve market efficiency and more effectively integrate clean energy resources.

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Enhancing reporting of greenhouse gas emissions – In 2017, the ISO enhanced its greenhouse gas emissions reporting to include hourly greenhouse gas profiles for the month. System-related greenhouse gas emissions are available on our website and mobile app. The most recent system-wide greenhouse gas reduction is 31.5 percent as compared to 2014.

Website and social media – Over the past several years, the ISO continued to invest in its electronic, web and social media platforms to enhance public interaction and awareness. The ISO websites (www.caiso.com, www.flexalert.org, www.WesternEIM.com), the [ISO Today](#) mobile app, Twitter ([@California_ISO](https://twitter.com/California_ISO)) and [Energy Matters newsletter](#) have all significantly increased in viewership over the past three years.