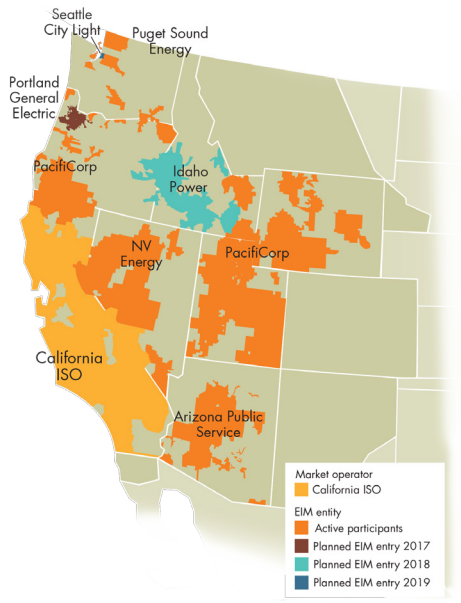
California ISO

EIM FAQ

Expanding regional energy partnerships

WHAT IS THE ENERGY IMBALANCE MARKET?

The ISO's Energy Imbalance Market (EIM) is a real-time bulk power trading market, the first of its kind in the western United States. EIM's advanced market systems automatically find the lowest-cost energy to serve real-time customer demand across a wide geographic area. Since launching in 2014, the western EIM has enhanced grid reliability and generated cost savings for its participants. Besides its economic advantages, the EIM improves the integration of renewable energy, which leads to a cleaner, greener grid.



HOW DOES THE EIM WORK?

The EIM allows participants to buy and sell power closer to the time electricity is consumed, and gives system operators real-time visibility across neighboring grids. The result is improved balance between supply and demand at a lower cost. The EIM software balances fluctuations in supply and demand by automatically finding lower-cost resources from across a larger region to meet immediate power needs. EIM also manages congestion on transmission lines to maintain grid reliability and supports integration of renewable resources. The real-time market also allows oversupply of renewable energy to be absorbed at low cost by participating systems.

WHO ARE THE CURRENT PARTICIPANTS IN EIM?

The ISO launched the western EIM on Nov. 1, 2014 with its first utility participant, Oregon-based PacifiCorp. EIM was later joined by Las Vegas-based NV Energy on Dec. 1, 2015, Puget Sound Energy of Bellevue, Washington, and Arizona Public Service of Phoenix, Arizona, on Oct. 1, 2016. EIM is now providing cost savings for consumers in eight western states.

WHAT ARE THE BENEFITS OF PARTICIPATING IN THE EIM?

Significant benefits from increased regional coordination for energy generation and delivery are in three main areas:

- **Reduced costs for utility customers and ISO market participants.** This is the result of less need for costly reserves, and better planning and efficient use of the regional high-voltage transmission system.
- **Reduced carbon emissions and more efficient use and integration of renewable energy.** For instance, when one utility area is generating excess hydroelectric, solar, or wind power, the ISO can use the output to serve customers in California or in one of the other EIM participant service territories. Likewise, when California is experiencing oversupply situations, excess solar energy can help meet demand in the states served by EIM that otherwise would be met by more expensive coal or gas generation.
- **Enhanced reliability.** By increasing visibility across electricity grids, improving transmission planning, and enhancing management of congestion across a wider expanse of the high-voltage transmission system.

WHAT ARE THE BENEFITS TO THE ISO?

Improved coordination and integration of renewable resources in the EIM provides a more cost-effective and accessible platform for California and other western states to gain real-time access to low-cost energy resources over the entire western region.

WHAT ARE THE OTHER BENEFITS TO PARTICIPATION IN THE EIM?

Easy and economical entry and exit

Studies indicate that the benefits to all customers in the eight-state EIM footprint outweigh the costs of participating in the EIM. In addition, an EIM participant can choose to leave the market at any time with no exit fees — it is a voluntary and more efficient way to manage the grid for the benefit of consumers.

Preserving autonomy

EIM participants maintain operational control over their generating resources, retain all their obligations as a balancing area, and must still comply with all regional and national reliability standards. For example, obligations to provide reliability compliance, ancillary services, physical scheduling rights and bilateral trades do not change with EIM.

WHAT IS THE EIM GOVERNANCE STRUCTURE?

In May 2014 the ISO Board of Governors appointed the EIM Transitional Committee to develop a long-term independent governance structure. Upon holding several open meetings throughout the West in 2015, the Committee completed a long-term governance proposal, which was approved by the ISO Board of Governors on Dec. 18, 2015. The ISO Board seated a permanent EIM Governing Body in June 2016. Future members will be approved by the EIM Governing Body. Continued stakeholder involvement will be critical to the success of the EIM by offering valuable input and support to expand a market that can be leveraged to more effectively use resources in the West. See the EIM enhancements initiative page for the current status of activity.

HOW CAN I LEARN MORE?

The ISO has a webpage dedicated to EIM activities, with links to quarterly benefit studies, stakeholder meetings, Governing Body meetings and other important information. Please visit the EIM page here.

EIM Participants

PacifiCorp

Serves:	1.8 million customers across 136,000 sq. miles in six Western states (Oregon, Washington, California, Utah, Wyoming and Idaho)
Employees:	6,000
Headquarters:	Portland, Oregon
Generation capacity:	10,595 megawatts
Transmission:	Over 16,300 miles of transmission lines Over 62,930 miles of distribution lines

PacifiCorp is a wholly-owned subsidiary of Berkshire Hathaway Energy and regulated by the public services commissions in the six states it serves.

NV Energy

Serves:	1.3 million customers (40 million tourists annually)
Employees:	3,000
Headquarters:	Las Vegas, NV
Generation capacity:	6,100 megawatts
Transmission:	controls over 3,800 miles of transmission lines

NV Energy is a wholly-owned subsidiary of Berkshire Hathaway Energy and regulated by the Public Utilities Commission of Nevada.

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Serves:	1.2 million customers across 11 of 15 Arizona counties)
Employees:	6,366
Headquarters:	Phoenix, Arizona
Generation capacity:	6,500 megawatts
Transmission:	About 5,900 miles of transmission lines About 29,000 miles of distribution lines

Arizona Public Service is a wholly-owned subsidiary of Pinnacle West Capital Corporation and regulated by Arizona Corporation Commission.

PSE Puget Sound Energy

Serves:	1.1 million customers
Employees:	2,700
Headquarters:	Bellevue, Washington
Generation capacity:	3,000 megawatts
Transmission:	13,000 miles of transmission and distribution lines

PSE is a subsidiary of Puget Energy and is regulated by the Washington Utilities and Transportation Commission.

Portland General Electric (pending)

Serves: 852,000 customers
Employees: 2,600
Headquarters: Portland, Oregon
Generation capacity: 3,414 megawatts
Transmission: 17,500 miles of transmission and distribution lines

PGE is an investor-owned utility regulated by the Public Utility Commission of Oregon.

Seattle City Light (pending)

Serves: 422,810 customers
Employees: 1,872
Headquarters: Seattle, Washington
Generation capacity: 2,014 megawatts
Transmission: 656 miles of transmission lines; 2,336 miles of distribution lines

Seattle City Light, a department of the city of Seattle, is one of the nation's largest publically owned utilities in terms of the number of customers served.

Idaho Power (pending)

An IDACORP Company

Serves: 525,000 customers
Employees: 2,000
Headquarters: Boise, Idaho
Generation capacity: 3,595 megawatts
Transmission: 4,860 miles of transmission lines; 27,092 miles of distribution lines

Idaho Power is a wholly-owned subsidiary of IDACORP, an independent, publicly traded company. Idaho Power is regulated by public utilities commissions in Idaho and Oregon.