

LOWERING BARRIERS TO ELECTRICITY TRADE CAN SAVE THE WEST UP TO \$840 MILLION A YEAR



WHAT IS A SEAM?

A seam is the boundary between two separately run electricity markets.

Each market has its own rules, schedules, data systems and ways of managing transmission congestion.

When power crosses from one market to the other, those differences create challenging inefficiencies, leading to:

- Extra costs for power,
- Delays in the delivery of power, and
- Missed chances to use the cheapest power available.

BETTER-CONNECTED WESTERN MARKETS CAN CUT COSTS, STRENGTHEN RELIABILITY AND UNLOCK CLEAN ENERGY

Analysis of the economic inefficiencies between day-ahead electricity markets — known as “seams” — finds that they could **cost Western electric ratepayers billions of dollars per year**, but that a sizable share of those costs could be mitigated if grid operators and regulators work to keep power flowing freely across the region.

For decades, Western utilities have traded power through a patchwork of bilateral contracts and separately managing their transmission systems.

That is starting to change with the development of two new electricity markets: The **Extended Day-Ahead Market** operated by California Independent System Operator, and **Markets+** operated by the Southwest Power Pool.

Utilities across the West are making commitments to one market or the other, and those choices are creating economic inefficiencies and new artificial boundaries across the grid.

So long as these boundaries between markets exist, how they are managed will have a significant effect on what families and businesses pay for electricity.

About the analysis

The study, conducted by Aurora Energy Research and sponsored by Environmental Defense Fund and Natural Resources Defense

Council, models the Western grid in a sample year (2032) under four scenarios:

- A single West-wide market
- Two markets with very efficient seams management
- Two markets with standard seams management
- Two markets with poor seams management

The estimated seams costs used in the model are based on real-world trading data from the borders between Eastern grid operators.

Findings: Seams drive up electricity costs

When it's harder to trade across market borders, utilities buy less low-cost power from their neighbors and run more expensive power plants instead. The analysis found that:

- Poorly managed seams cost the West \$839 million more a year than well-managed seams — **a 4.5% increase in total system costs.**

- About \$400 million of the cost comes from administrative and coordination friction at the border.
- Up to \$440 million more comes from less efficient use of transmission and power plants (mostly renewables like hydro, solar and wind) across the region.
- Even average coordination leaves money on the table. Moving from standard to best practices **saves another \$225 million a year**, a 1.2% cut in total system costs.
- A single market goes furthest — about \$1.2 billion lower system-wide costs each year than even the best-managed two-market system.

The Western grid can handle more

Western utilities' own resource plans project steep growth in electricity demand over the next decade, driven by data centers, electrification and population growth. When one utility is strained by a heatwave or demand is higher than forecast, it needs to reach its neighbors' resources quickly.

Aurora Energy Research's modeling shows that better-coordinated markets let regions lean on each other throughout the day, with hydro-electric power from the Pacific Northwest, solar from California, Desert Southwest generation and wind from the Rocky Mountains each filling gaps in the others' supply. Poorly managed seams will make it more expensive and harder to move power to where and when it's needed, threatening grid reliability.

With strong seams management, trade across the West grows by **43 terawatt-hours a year** compared with poor coordination. **This is roughly equivalent to 10 Hoover Dams worth of annual energy generation, enough to power 4 million homes.**

Unlocking more clean energy

To make the most of the West's high renewable potential to generate clean energy resources, the electricity they generate needs to be delivered where it's needed — otherwise that affordable clean power will go to waste.

Lower barriers to trade mean less reliance on fossil fuel generation. With strong seams management, the West runs less gas and coal and more wind, solar and hydro. The study notes that this benefit is likely understated, because the study held each utility's planned power plants fixed. In reality, better-connected markets would encourage more clean energy investment over time.

UP TO \$840 MILLION IN ANNUAL SAVINGS

Analysis from Aurora Energy Research finds that strong coordination between Western markets would **save up to \$840 million a year** compared with poorly managed seams. A single West-wide market would save the most: **about \$1.2 billion more each year** than even the best-managed two-market system.

Paths to lowering barriers

Get seams management right: Aurora identifies four practices that separate strong coordination from weak coordination:

- Open, consistent information sharing between markets
- Standardized data across market borders
- Congestion management that covers the full network
- Automated real-time communication between operators

Eastern grid operators already use tools like joint operating agreements and coordinated transaction scheduling. The West can build on that experience.

Expand and unify markets: Every seam that disappears lowers costs. A single West-wide market delivers the largest savings, and each utility that joins a common footprint brings the region closer to that result.

Looking ahead

The landscape in the West is continuing to evolve. As markets go live, and utilities make new commitments on which market they join, lowering barriers to cost-effective trade between seams will be critical to realizing the full power of markets to lower energy costs.

The Federal Energy Regulatory Commission has directed the operators of the Extended Day-Ahead Market and Markets+ to work together and outline how they plan to manage their market seam. The regulatory review that will follow will be an important means for setting a high bar on how seams will be managed in the West.

The Federal Energy Regulatory Commission and state utility commissions should:

- Hold market operators to best-practice seams coordination
- Where possible, consider eliminating seams by unifying markets to maximize cost savings

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