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Western Transmission: Increasing Transparency and Overcoming Congestion

The West currently faces several barriers to optimized transmission use, including a lack of transparent data and sufficient line capacity. A West-wide regional transmission organization (RTO) or independent system operator (ISO) could help relieve these barriers.

An organized wholesale market (OWM) is a centrally managed market that provides a platform for transparent and competitive wholesale electricity trading. The most advanced markets are operated by **a regional transmission organization (RTO) or independent system operator (ISO)** to *more optimally match supply and demand* between a larger collection of electricity generators and resellers. RTO and ISO are sometimes used interchangeably; we say RTO here for simplicity.

Why does having transparent transmission data matter?

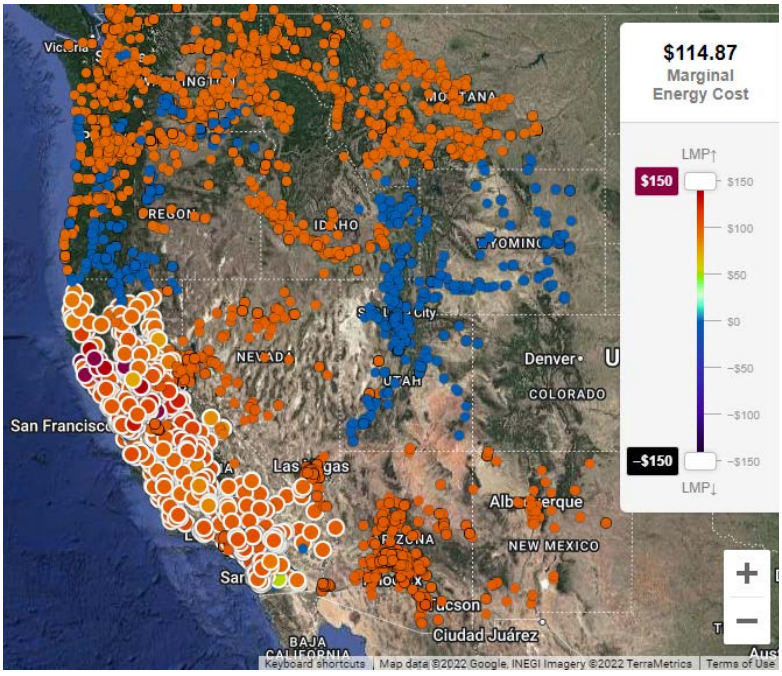
This data:

- Supports successful transmission planning, operation, and regulation — all of which can reduce congestion — by enabling informed decisions by policymakers, developers, landowners, and regulators at all levels of government.
- Increases stakeholder engagement, helps maximize customer benefits, and lowers public opposition to projects.[1]
- Holds transmission entities accountable by allowing public parties to verify reported data.

The wild West of transmission data?

While grid operators in other regions have transmission flow data to reliably operate the grid, the West currently has:

- No unifying data platform for stakeholders *(data is difficult to find)*
- No publicly available actual transmission flow data *(line utilization is unknown)*
- No standard method for reporting transmission metrics *(datasets are difficult to compare)*
- No standard definitions for transmission metrics *(datasets are difficult to compare)*
- Minimal data visualizations *(useful insights are buried in spreadsheets)*



Marginal energy costs are a proxy for transmission congestion

1 https://rebuyers.sharepoint.com/sites/REBAPolicyAdvocacy/Shared%20Documents/Forms/AllItems.aspx?id=%2Fsites%2FREBA%2DPolicyAdvocacy%2FShared%20Documents%2FCEBI%2FDesigning%20the%2021st%20Century%20Grid%2FAll%20Final%20Products%2FCEBI%2DElectric%2DTransmission%2DPlanning%2DPrimer%2Epdf&parent=%2Fsites%2FREBA%2DPolicyAdvocacy%2FShared%20Documents%2FCEBI%2FDesigning%20the%2021st%20Century%20Grid%2FAll%20Final%20Products

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What is transmission congestion?

Transmission congestion occurs when there is insufficient line capacity to deliver electricity without exceeding the thermal, voltage, and stability limits that ensure reliability.

Why does congestion matter?

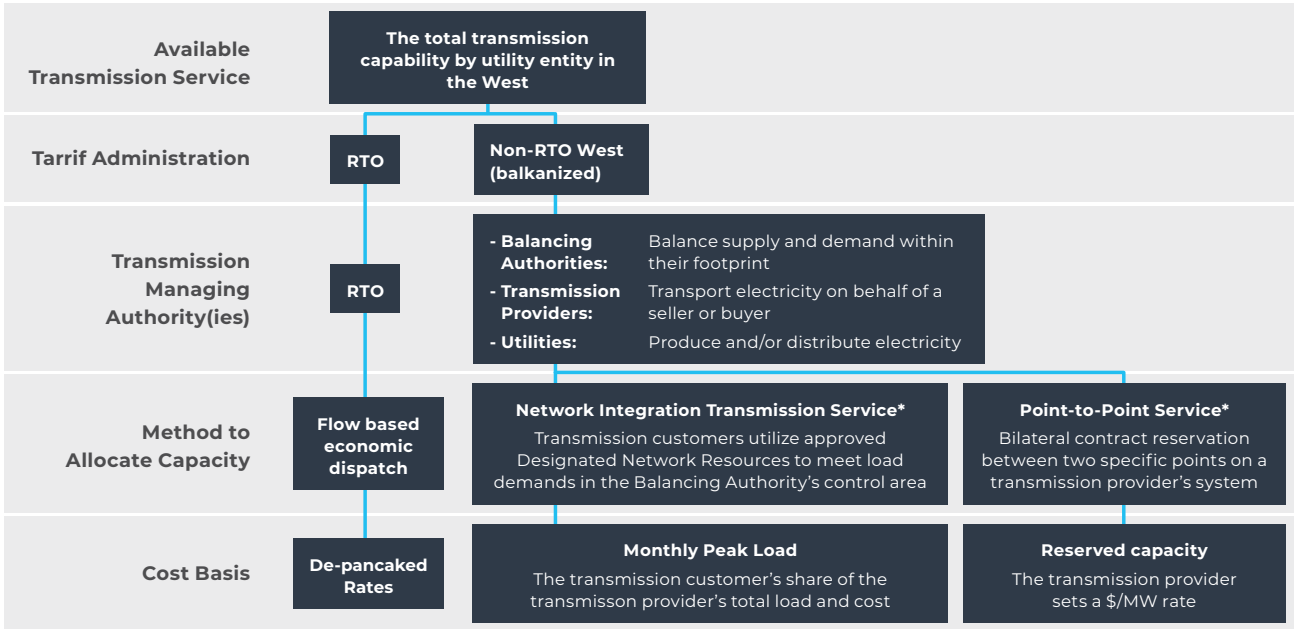
- It limits electricity delivery and increases curtailment of lower-cost (typically renewable) generation resources.
- It increases electricity costs for customers in congested areas, as reflected in higher Locational Marginal Prices (LMPs).[2]

How congested are Western lines?

- 30% of major transmission pathways are operated at >75% capacity >11% of the year.[3]
- Transmission congestion cost U.S. customers $6.1 billion in 2019.[4]
- In 2022, CAISO attributed 4/5 of curtailment to local transmission constraints and 1/5 to system-wide oversupply.[5]

How is open access transmission service managed in the West?

Transmission service in the non-RTO West is managed by several different utility entities. Transmission service is procured and allocated based on **Point to Point or network integration transmission service contracted between transmission providers and transmission customers**. When congestion or physical outages occur, transmission service can be curtailed based on firm (high priority) or non-firm (low priority) reservation types.



** These products are allocated in non-RTO regions based on Contract Path methodology according to Available Transfer Capability (AFC). Network Integration Transmission (NITS) and Point to Point Service (PTP) are procured by customers in RTOs based on Available Flow Gate Capability (AFG).*

2 https://gridstrategiesllc.com/2019/09/17/transmission-congestion-costs-in-the-u-s-rtos/#:~:text=58%20from%20the%20above%20approximates,and%20%246.1%20billion%20in%202019.

3 https://www.wecc.org/Reliability/State%20of%20the%20Interconnection%20Digest%20(Summer%202017).pdf

4 https://gridstrategiesllc.com/2019/09/17/transmission-congestion-costs-in-the-u-s-rtos/#:~:text=58%20from%20the%20above%20approximates,and%20%246.1%20billion%20in%202019.

5 http://www.caiso.com/Documents/Wind_SolarReal-TimeDispatchCurtailmentReportDec19_2022.pdf

Congestion and data transparency benefits of a future West-wide RTO:

An RTO could be a key tool for reducing congestion and increasing transparency.

AN RTO HELPS MITIGATE CONGESTION:

Transmission service requests are reduced internal to the region, saving customers money in the West.[6]

More efficient use of the existing transmission system is enabled by centrally optimized electricity transactions.[7]

Regionalized transmission planning and investments are enabled to serve a multi-state area, avoiding the local transmission planning that is too myopic to meet the long-term needs of a region.[8]

RTOs are required by FERC to develop market-based congestion management and mitigation strategies, including the adoption of Locational Marginal Pricing (LMP).[9]

AN RTO INCREASES DATA TRANSPARENCY:

RTOs are required by FERC to publicly post real-time pricing, system constraints, uplift costs, resource commitment decisions, operations data, and the cost of system congestion.[10]

RTOs provide and summarize information on local and regional scheduled and actual flow.[11] These data benefit customers' economic decision-making and provide valuable information on system security and reliability.

According to the U.S. Department of Energy-funded 2021 State Led Market Study, "an RTO is anticipated to provide the most transparent and timely access to information."[12]

6 https://www.aee.net/western-rto

7 https://static1.squarespace.com/static/59b97b188fd4d2645224448b/t/605259cc9b7dcf72028b40ef/1616009678656/March+3%2C+2021+-+Stakeholder+Meeting+Presentation.pdf

8 https://rebuyers.sharepoint.com/sites/REBA-PolicyAdvocacy/Shared%20Documents/Forms/AllItems.aspx?id=%2Fsites%2FREBA%2DPolicyAdvocacy%2FShared%20Documents%2FCEBI%2FDesigning%20the%2021st%20Century%20Grid%2FAll%20Final%20Products%2FCEBI%2DElectric%2DTransmission%2DPlanning%2DPrimer%2Epdf&parent=%2Fsites%2FREBA%2DPolicyAdvocacy%2FShared%20Documents%2FCEBI%2FDesigning%20the%2021st%20Century%20Grid%2FAll%20Final%20Products

9 https://www.nrel.gov/docs/fy02osti/32180.pdf

10 CEBA's Western Market Expansion Pitch Deck

11 State-Led Market Study Stakeholder Meeting – Q1 2021 AND https://static1.squarespace.com/static/59b97b188fd4d2645224448b/t/6148a03ea5c43d63b2873506/1632149569046/Final+Roadmap+-+Market+and+Regulatory+Review+Report+210730.pdf

12 https://static1.squarespace.com/static/59b97b188fd4d2645224448b/t/6148a03ea5c43d63b2873506/1632149569046/Final+Roadmap+-+Market+and+Regulatory+Review+Report+210730.pdf