2J. REGIONAL TRANSMISSION INTEGRATION AND MARKET DEVELOPMENT

REGIONAL TRANSMISSION ORGANIZATIONS

A large portion of the electric load in the U.S. is procured through market transactions overseen by various Regional Transmission Organizations (RTOs) and Independent System Operators (ISOs).[67] These organizations are independent entities that emerged because of guidelines prescribed in FERC Orders 888 and 889 with which FERC sought to introduce competition and efficiency into electricity markets. RTOs/ISOs are charged under these orders with promoting nondiscriminatory access to the grid.[68]

The California ISO (CAISO) is the only ISO or RTO in the western United States. Much of Alberta and British Columbia, which are part of the U.S. Western Grid, are served by their own ISOs. While most of Montana's service area is not part of an RTO, the MISO, which covers much of the Midwest, covers parts of eastern Montana that lie in the U.S. Eastern Grid. Most of the U.S. Western Interconnection is not part of an RTO. From here on, we will use RTO to refer to an ISO or RTO as they are virtually the same thing

RTOs are independent and each one has its own complex rules. RTOs provide open access to the transmission system, and optimize the dispatch of generation across broad areas, rather than have each utility do so. Typically, a fully functional ISO has a single balancing authority and conducts the reliability coordination functions for all member utilities. A utility that does not participate in an RTO, sets their own stacking order and costs, typically with bilateral contracts. An RTO does this for all of its utilities and dispatches generation accordingly. An RTO, in theory, allows all parties to signal their willingness to pay for transmission access and makes more efficient use of the grid. In addition, RTO management results in congestion price signals that encourage economic decisions on the location of new generation and on the expansion of capacity on congested transmission paths. RTOs also over time save utilities and their ratepayers money by allowing better access to cheaper generation and by saving balancing areas the need to build additional generation.

RTO transmission pricing generally avoids pancaked transmission rates (paying a single rate for each balancing authority crossed) and signals the actual amount of congestion on the system. Two types of transmission tariffs under RTOs are postage stamp and license plate rates. With postage stamp rates, transmission costs are recovered uniformly from all loads in a defined market area. With a license plate rate, each utility recovers the costs of its own transmission investments that reflects the costs and usage in the transmission zone within which they are located. RTO's also generally plan transmission expansion for their whole footprint over a larger area, versus each utility doing their own planning.

Discussions about allowing an independent body to take over operation and control of access for the transmission system began in the mid-1990s among transmission owners and other stakeholders in the Pacific Northwest. Effects of an RTO on Montana will need to be examined as the possibility of market formation grows. Talks continue among various entities in the West on expanding energy cost savings. Talks are also occurring on taking an incremental approach and developing certain aspects of RTOs such as Energy Imbalance Markets (discussed below) rather than implementing an RTO all at once. PacifiCorp, which operates as a retail electric utility in pockets across the Western Interconnect, including parts of Wyoming that neighbor Montana, has been working with CAISO to evaluate the steps that would be needed to integrate CAISO and the balancing authorities operated by PacifiCorp. The Mountain West Transmission Group, a group of electricity service

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67 For our purposes here, we will regard RTOs and ISOs as the same thing.

68 Markets for Power in the United States, Paul L. Joskow, The Energy Journal, Vol. 27, No. 1, 2006, page 17.

providers that cover Colorado and parts of four other western states, is exploring joining with the Southwest Power Pool's regional transmission organization, which currently resides on the U.S. Eastern grid, but which could expand to the western grid.

ELECTRICITY MARKET DEVELOPMENT

Over the past several decades, the U.S electric sector has trended toward organized markets to promote efficiency, reliability, cost savings and to lower emissions and assist states and utilities in meeting environmental goals.

The Western Energy Imbalance Market (EIM) is a real time wholesale energy trading market that enables participants anywhere in the West to buy and sell energy when needed. It is governed by the CAISO. To date, the EIM has generated over a billion dollars in gross profits.[69] The EIM allows participants to buy and sell power close to the time electricity is consumed, and gives system operators real-time visibility across neighboring grids. The result improves balancing supply and demand at a lower cost.[70] An EIM aggregates the variability of generation and load over balancing authorities and reduces the total amount of required reserves for a balancing area.

The enhanced day-ahead market is related to the Western EIM. As stated on CAISO's website[71]:

> *"This initiative will develop an approach to extend participation in the day-ahead market to the Western Energy Imbalance Market (EIM) entities in a framework similar to the existing EIM approach for the real-time market, rather than requiring full integration into the California ISO balancing area. The extended day-ahead market (EDAM) will improve market efficiency by integrating renewable resources using day-ahead unit commitment and scheduling across a larger area."*

Another RTO, the Southwest Power Pool, is looking to serve utilities across the west with its own grid services program, called Markets +, which would also offer an EIM and day-ahead market.

RESOURCE ADEQUACY PLANNING

Electric system reliability is expensive and currently in short supply across Montana and the Pacific Northwest. NorthWestern is one of the most capacity deficient utilities in the region, meaning it is short on flexible, dispatchable resources that can meet peak electricity demands, according to the utility. A combination of the shifting portfolio of generation assets across the Pacific Northwest and Montana, including coal plant retirements and significant new variable renewable energy assets, the increasing frequency of severe weather events, and increasing demand for electricity are creating new challenges for utilities and grid operators.

With a goal of improving reliability and flexibility for utilities across the west, the Western Power Pool, an organization of utilities and independent power producers, is developing the Western Resource Adequacy Program (WRAP). Absent an RTO in the immediate region this program is designed to help utilities share

69 https://www.caiso.com/Documents/western-energy-imbalance-market-fact-sheet.pdf

70 https://www.westerneim.com/Pages/About/HowItWorks.aspx

71 https://stakeholdercenter.caiso.com/StakeholderInitiatives/Extended-day-ahead-market

resources in an organized way when needed (such as when one utility comes up short unexpectedly), and lower the chances that individual utilities will need to curtail load due to inadequate generation resources. The Montana Energy Office served on an advisory committee during the design and start-up phases of the WRAP. The WRAP will likely affect Montana customers of NorthWestern, which is participating in the first non-binding stage of this program, as well as electric cooperatives served by BPA, an additional participant in the WRAP.

Within this program, entities can pool the risk and the associated reserves and benefit from the so-called "diversity benefit" of the region, with overall reliability cost reductions being one of the targeted outcomes. Load and resource diversity drive the regional savings. In a large portion of the Western Power Pool footprint, utilities manage resource adequacy individually and with different methods. A regional resource adequacy program promises to facilitate coordinated resource forecasting and planning.

STATE-LED ANALYSIS OF MARKET BENEFITS AND COSTS

The last several years have featured numerous discussions and initiatives related to the formation of coordinated wholesale trading markets in the West. The Utah Governor's Office of Energy Development, in partnership with State Energy Offices of Idaho, Colorado, and Montana, applied for and received a grant from the U.S. Department of Energy to facilitate a state-led assessment of organized market options. The project was called Exploring Western Organized Market Configurations: A Western States' Study of Coordinated Market Options to Advance State Energy Policies or "State-Led Market Study".[72]

The project provided Western States with a neutral forum, and neutral analysis, to independently and jointly evaluate the options and impacts associated with new or more centralized wholesale energy markets and potential footprints. The regional economic case for new/expanded markets is supported by the technical findings of the study. Capacity benefits for the U.S. West were estimated at around 1,100 MW for an EIM and about 11,300 MW for an RTO (this is the estimated amount of electricity generation that would not have to be built for reliability under an organized market). The RTO market constructs achieved the greatest level of capacity savings of all constructs. At the state-level, all states achieve positive capacity savings in all market configurations. In addition, all states have estimated savings greater than $10 million per year under the One Market RTO construct. RTOs resulted in the most carbon emissions reductions and the least renewable curtailments compared to EIMs and a day-ahead market, according to the study. A west-wide RTO could result in up to $2 billion in benefits per year for the entire region.

The report also concluded that informed state engagement throughout the process of proposed market expansion is a best practice that can enhance states' ongoing influence and potentially improve outcomes associated with market formation. States can play a crucial role in shaping discussions around the development of market expansion proposals and in crafting an ongoing role for states through an influential regional state committee. To the extent that market proposals culminate in utilities seeking state public utility commission approval to join a market, utility commissions have an opportunity to carefully evaluate the proposal and set forth conditions of approval for market participation, reaffirming the important role of states in potential market expansion. In Montana, that body is the PSC. States can carefully consider any proposals that may come before them to unbundle retail electric rates in a manner that may reduce state jurisdiction over these costs.

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

2K. CURRENT TRANSMISSION ISSUES

TRANSMISSION CAPACITY TO ACCOMMODATE NEW GENERATION IN MONTANA

There is a "chicken and egg" problem in developing new transmission projects to facilitate economic development. If no transmission capacity is available to reach markets, generation developers may have a difficult time financing transmission projects. Yet without financing, potential generators probably can't make firm commitments to purchasing rights on lines in order for utilities to invest in new transmission capacity projects. Alternative approaches involve generation developers building for anticipated new load or construction of new merchant transmission capacity built in the hopes that generation will appear. These strategies still require financial markets to be convinced that the projects are viable.

New generation plants usually need firm power purchase agreements (PPA) in place with an off-taker in order to obtain project financing. Occasionally, generation plants are built to market their energy to sell into wholesale markets, but this is more common in deregulated electricity markets. With low spot prices across the West and tightened lending requirements (by financial institutions), the majority of projects expected to be built in the western U.S. in the next decade will probably need firm power purchase agreements before ground is broken. Few transmission projects were built at all in the U.S. West in the 2010s. The challenge that Montana projects—like all projects—face is contracting to produce power for customers at a price that is both profitable to the project developer/owner and competitive with other energy sources, including sources potentially closer to the end-consumer. Transmission charges could be high enough between Montana resources and West Coast load centers to challenge the competitiveness of Montana-based projects. Low/volatile electricity prices and ISOs/RTOs have thrown even more uncertainty into the process.

The regulatory structure in Montana requires a showing of need for new transmission projects that are 230 kV or larger and ten miles or longer that fall under MFSA (75-20-104(8)(a)(i), MCA). Transmission builders without PPA contract commitments from potential new generators looking to contract for transmission service may face an uphill battle in demonstrating the need for new transmission. Further complicating this issue is that many attributes of power, such as flexibility, ramping capability, etc. are not currently valued in energy markets. Thus, a generator that provides grid and/or power flexibility (such as a natural gas plant) may not be valued enough in the market to build the project at a time when such flexibility is needed on the grid.

SMART GRID

A smart grid is a modernized electrical grid that uses information and communications technology to gather and act on information in an automated fashion to improve the efficiency, reliability, economics, and sustainability of the production and distribution of electricity. "Smart grid" generally refers to a class of technology people are using to bring utility electricity delivery systems into the 21st century, using computer-based remote control and automation. These systems are made possible by two-way communication technology and computer processing that has been used for decades in other industries. Smart grid technology is beginning to be used on electricity networks, from the power plants and wind farms all the way to the consumers of electricity in homes and businesses. A smart grid can alert customers to real time prices in order to promote conservation and allow for tiered electricity pricing. This technology can also help the grid be managed from many places and sensors rather than one central location, and potentially lead to lower restorations times after a blackout. Concerns about the smart grid include cost, cybersecurity concerns, and personal privacy.