

ORGANIZED MARKET RETROSPECTIVE

A Review of Organized Market Efforts in the West

October 2021



Contents

I.	Executive Summary	3
II.	Introduction and Background.....	9
III.	Organized Market Functions	13
IV.	Western Initiatives to Expand Cooperation	15
V.	Key Takeaways and Proposed Next Steps	20
VI.	Appendix A: Market Functions and Efforts to Share	22
	a. Shared Transmission Planning.....	22
	b. Shared Resource Adequacy Standard	22
	c. Shared Transmission Service Provider	23
	d. Shared Transmission Operator.....	24
	e. Shared Balancing Area Operator	24
	f. Market Operator -- real-time, day-ahead transactions	25
	g. Participation in an existing RTO/ISO	26
VII.	Appendix B: Chronology of Market Initiatives.....	26
	a. 1995 – 1999: Independent Grid Operator (IndeGO).....	26
	b. 2000 – 2006: RTO West/Grid West	29
	c. 2012 – 2016: Northwest Power Pool Market (MC) Initiative	32
	d. 2014 – Present: Western Energy Imbalance Market	35
	e. 2015 – 2018: PacifiCorp as a Participating Transmission Operator in CAISO	37
	f. 2013 – 2018: Mountain West Transmission Group	39
VIII.	Appendix C: Regulatory and Other Considerations.....	41
	a. FERC Order 888	41
	b. FERC Order 2000	42
	c. FERC NOPR Standard Market Design	44
	d. BPA Considerations for Market Participation.....	45
	References.....	46

I. Executive Summary

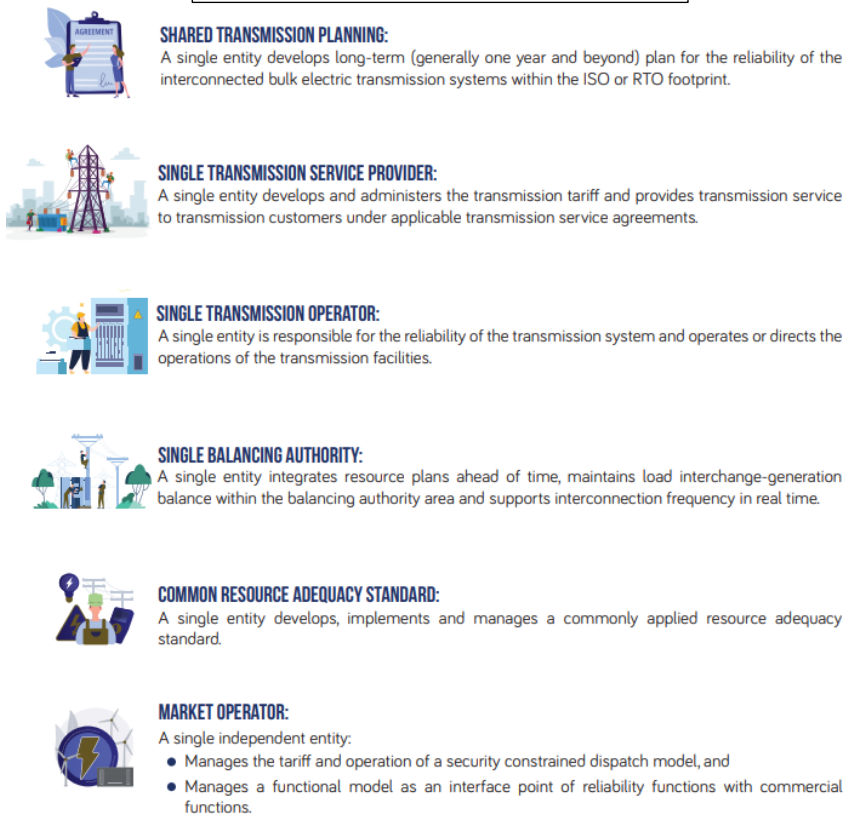
Purpose

While approximately 60% of the U.S. electric supply is managed by an Independent System Operator (ISO) or a Regional Transmission Organization (RTO), Northwest utilities do not presently participate in an organized market except for those utilities that voluntarily participate in the real-time Western Energy Imbalance Market (EIM). Over the last 25 years, the region has considered several utility-led initiatives to coordinate transmission planning and operations or to centralize electricity markets functions. The only initiative that has fully achieved its intended goal is the Western EIM. The purpose of this retrospective is to review past regional efforts to create shared market functions, identify challenges impacting the success of the efforts, and summarize key learnings and helpful actions to inform current and future efforts for exploring shared market functions in the Northwest.

Organized Market Functions

The ISO and RTOs that exist in other parts of the country perform various market functions for the utility participants under an independent governance structure (see Figure 1). While the market functions performed by the existing ISOs and RTOs are broad, many of those ISOs and RTOs started by only performing some of the market functions and incrementally added more functions. Northwest utilities have evaluated several different proposals over the last few decades that attempted to centralize some or all of these market functions. In the early explorations, the focus was on centralized transmission planning and operations. In the last decade, the focus has been on centralized electricity market operations.

Figure 1. Organized Market Functions



Western Initiatives

IndeGO

Northwest efforts to evaluate and explore organized markets began in 1995 with an effort to develop an Independent Grid Operator, referred to as IndeGO. IndeGO was initiated during federal legislative efforts to deregulate the electric power industry and a Federal Energy Regulatory Commission (FERC) rulemaking and resulting set of orders designed to provide for open access transmission (Orders 888 and 889). The effort ended in 1999 due to different perspectives on the scope of transmission to be included, questions about Bonneville Power Administration's (BPA) legal ability to participate and concerns that some utilities would pay higher incremental costs for transmission relative to their benefits.

Based on North American Electric Reliability (NERC) Definitions

RTO West and Grid West

A second attempt by Northwest utilities to establish an RTO in the Northwest called RTO West was initiated in response to FERC Order 2000 (1999) and the Notice of Proposed Rulemaking (NOPR) for a Standard Market Design (2002). The 2001 power crisis exposed the risks and significant financial impacts of poor market design and prompted concern about creating a California-style market in the Northwest. Other concerns about this approach were the high costs experienced by other RTOs across the country and the risk of losing local control as a result of FERC jurisdiction. Several public power entities formed a coalition to oppose RTO West and the FERC proposed Standard Market Design NOPR. In 2004, RTO West removed the market framework and continued as Grid West with a focus on coordinated transmission planning, service, and operations. Ultimately, agreement could not be reached among investor-owned and consumer-owned utilities, and the effort dissolved in 2006.

Northwest Power Pool Market Assessment and Coordination Committee Initiative

In response to the addition of large amounts of renewable resources in the region, federal and regional studies on the integration of renewable generation, and policy recommendations for the creation of an Energy Imbalance Market (EIM), the Northwest Power Pool Market Assessment and Coordination Committee (NWPP MC) Initiative was formed in 2012. The effort focused on the design for a within-hour security constrained economic dispatch to be run by an independent market operator. Simultaneous to the NWPP MC effort, PacifiCorp partnered with the California ISO (CAISO) to create an energy imbalance market built off the CAISO's existing real-time market. The NWPP MC effort continued its design and recruitment of a market operator, but the cost of developing a unique within-hour market proved to be challenging relative to the cost to join the newly launched Western EIM market hosted by CAISO. The NWPP MC Initiative was also impacted by issues associated with transmission use and cost allocation, varying viewpoints on the appropriate governance structure, and different long-term goals of the NWPP MC participants.

Western EIM

The Western EIM started in 2014 with PacifiCorp as the first participant. Today, more than 83% of load in the Western Interconnection is currently participating or planning to participate in the future. When considering the full range of functions that an RTO or ISO would offer, the EIM offers only a small segment of functions that would be integrated through an RTO or ISO. The voluntary nature of the EIM, enabling participants to determine when to join, exit, and participate, and the use of available and free transmission are all factors that have been identified as important to its success. Moreover, interested utilities were able to individually choose to join at their own pace without consensus of a broader utility group, which accelerated its formation. And, last and perhaps most importantly, the EIM built on existing platforms developed by the CAISO that made the effort relatively less expensive and faster to implement than establishing an entirely new market.

PacifiCorp as a PTO in CAISO

PacifiCorp quickly found significant benefits from the EIM, and in 2015 initiated a process to become a Participating Transmission Owner (PTO) in the CAISO. PacifiCorp and its regulators required a modification to the existing CAISO governance structure, which relies on a vote by the Board of Governors whose members are appointed by the Governor of California. The California Legislature required a study of the benefits to California of PacifiCorp joining the existing CAISO market as a PTO before contemplating any changes to the governance structure. In parallel, an effort was launched with regional parties to develop a proposed regional governance structure. Ultimately, the California Legislature did not pass legislation to change CAISO's governance structure due to California constituent concerns about perceived negative economic and environmental impacts. Without a change in the CAISO governance structure, PacifiCorp withdrew its interest.

Mountain West Transmission Group

Although not a Northwest initiative, a review of the efforts of the Mountain West Transmission Group is instructive. Utilities in the eastern side of the Western Interconnection initiated a process to develop a single transmission tariff for the participating parties. The group made progress and developed a draft tariff that addressed issues of cost allocation, increased transmission costs to some participants, and treatment of exports and wheel throughs. Prior to pursuing implementation of the joint tariff, the group evaluated the benefits of the joint tariff relative to joining the Southwest Power Pool (SPP) RTO market as full Participating Transmission Owners. The analysis showed that joining the existing SPP RTO market had the highest value and the group moved to collectively join the SPP RTO market. The effort ultimately ended, however, when Public Service of Colorado pulled out of the effort due to concerns about long-term value and regulatory risk. Eight of the remaining Mountain West Transmission Group members worked with SPP to launch the Western Energy Imbalance Service which began operation in February 2021.

Figure 2. Overview of Market Functions by Initiative

	SHARED TRANSMISSION PLANNING	SINGLE TRANSMISSION SERVICE PROVIDER	SINGLE TRANSMISSION OPERATOR	SINGLE BALANCING AUTHORITY	COMMON RESOURCE ADEQUACY STANDARD	MARKET OPERATOR: DAY-AHEAD OPTIMIZATION AND DISPATCH	MARKET OPERATOR: WITHIN HOUR OPTIMIZATION AND DISPATCH
TRADITIONAL RTO/ISO	✓	✓	✓	✓	✓	✓	✓
INDEGO 1995 - 1998	✓	✓	✓	✓			
RTO WEST/ GRID WEST 2000 - 2006	✓	✓	✓	✓		✓	
NWPP MC INITIATIVE 2012 - 2016							✓
CAISO EIM 2013 - PRESENT							✓
MOUNTAIN WEST TX GROUP 2013 - 2018	✓	✓	✓	✓	✓	✓	✓
SPP WEIS 2020 - PRESENT							✓

MARKET FUNCTIONS INCLUDED

Figure 3. Summary of Western Initiatives to Expand Electric Utility Coordination

INITIATIVE	PURPOSE	KEY DRIVERS	CHALLENGES
IndeGO 1995-1998	Create an Independent System Operator to act as security coordinator, operate a single balancing authority area, and evolve into a single transmission provider	<ul style="list-style-type: none"> • Deregulation of other industries • FERC issues Notice of Proposed Rulemaking and Orders 888 and 889 	<ul style="list-style-type: none"> • Transmission cost allocation among participants • Different interests on level of transmission to be included • BPA legal determination that it could not sell, lease or transfer control of transmission without legislation
RTO West 2000-2004	Create a Regional Transmission Organization that would operate a single balancing authority area, be the transmission operator, and implement a common market framework	<ul style="list-style-type: none"> • FERC issues Order 2000 • FERC Issues Standard Market Design Notice of Proposed Rulemaking 	<ul style="list-style-type: none"> • 2001 Power Crisis raised concern about the benefits and risks of organized markets • FERC Standard Market Design negatively impacted productive regional discussions • Public Power concerns about the costs, a California-style market and federal jurisdiction
Grid West 2004-2006	Narrowed the scope of the transmission elements of RTO West and removed the common market framework	<ul style="list-style-type: none"> • Re-launch after RTO West to find common agreement 	<ul style="list-style-type: none"> • Public power concern about BPA turning over control to independent entity • Different perspectives on governance
NWPP MC 2012-2016	Centralized Market Operator: Within-hour optimization and dispatch	<ul style="list-style-type: none"> • Studies on EIM • Significant growth of wind generation in BPA's Balancing Authority Area 	<ul style="list-style-type: none"> • Cost to build new market design and system difficult to justify relative to alternatives • Transmission design that relied on use of BPA system created cost allocation issues and pancaked transmission for those not adjacent to BPA • Consensus-based approach to decision making was viewed to allow stalling of progress
Western EIM 2014-Present	Centralized Market Operator: Within-hour optimization and dispatch	<ul style="list-style-type: none"> • PacifiCorp-CAISO led effort to explore benefits of real-time imbalance market 	<ul style="list-style-type: none"> • New governance structure was needed for entities to be comfortable joining

INITIATIVE	PURPOSE	KEY DRIVERS	CHALLENGES
PacifiCorp as CAISO PTO <i>2015-2018</i>	PacifiCorp to become a full Participating Transmission Owner in CAISO's existing market	<ul style="list-style-type: none"> PacifiCorp interest in additional optimization benefits 	<ul style="list-style-type: none"> CA entities were concerned about paying costs of new transmission planned by PacifiCorp, potential increase in coal dispatch and increased FERC jurisdiction Other states required a change to CAISO governance and CA legislature did not pass legislation needed to make the change
Mountain West Transmission Group <i>2013-2018</i>	Shared Transmission Provider or join existing SPP RTO	<ul style="list-style-type: none"> Xcel Energy subsidiaries had found benefits in other markets. Public Service of Colorado (an Xcel company) initiated discussions with utilities 	<ul style="list-style-type: none"> Public Service of Colorado pulled out of the effort due to concerns about costs and regulatory risks

Key Takeaways and Proposed Next Steps for Market Coordination

Each of the initiatives to share market functions in the Northwest have been unique in their focus and approach but have run into similar obstacles. Some of the obstacles are typical of any multi-party effort to agree on shared operations of their transmission and power systems. The demonstration of benefits relative to cost is key and can be impacted by the alternatives that are evaluated. Governance is always a critical issue and market participants, state regulators, and environmental organizations have different perspectives. Finally, the process used to coordinate interested parties in the development of an organized market and whether they all are required to join can have an impact on success.

Some of the obstacles experienced in previous efforts are unique to the Northwest. BPA's large presence and statutory requirements create unique considerations. And specific preference customer interests can be difficult to align within an organized market structure. In addition, the large predominance of hydropower in the Northwest impacts how utilities find value in organized market functions. These issues have challenged each of the market efforts and must be addressed for any future success.

The Western EIM has achieved success with a low-cost, voluntary option using available and free transmission and leveraging the existing CAISO infrastructure. However, the Western EIM serves only a small portion of the functions that are offered by traditional ISOs and RTOs and the free transmission element cannot be expanded. Extension of the CAISO day-ahead market or creation of alternative market structures will require significant additional work.

Below is a summary of **Key Takeaways** associated with organized market initiatives in the West that are highlighted in this report:

- **All initiatives struggle over issues of transmission cost allocation, governance, and cost relative to benefits.**
- **The Northwest includes unique considerations and interests that further complicate the challenging issues of transmission cost allocation, governance and costs relative to benefits.**
- **The Western EIM was formed with a single entity and expanded rapidly because of its incremental, voluntary nature and reliance on as available, free transmission.**
- **The changing resource mix and load profiles in the West provide new reasons to evaluate increased market coordination.**
- **Success is more likely when there are regionally determined benefits rather than federal or other policy mandates.**

This retrospective also elaborates on the following **Proposed Next Steps** for future market coordination in the West:

- **Seek a long-term outcome that benefits the Western Interconnection while minimizing or mitigating impacts to individual entities.**
- **Identify any potential barriers for key parties to expanded market coordination.**
- **Explore options early for tackling the hardest issues associated with shared transmission.**
- **Recognize and work to align the varied regional interests around market coordination.**
- **Establish an independent and objective governance framework early to be used as a foundation for decision-making throughout the effort.**

II. Introduction and Background

Purpose

While many areas of the country are members of and operate under an Independent System Operator (ISO) or Regional Transmission Organization (RTO),¹ Northwest utilities are not members of an organized market except for those utilities that voluntarily participate in the real-time Western Energy Imbalance Market (EIM). Over the last 25 years, the region has considered several utility-led initiatives focused on coordinating transmission planning and operations or centralizing electricity markets functions. The purpose of this retrospective is to review past regional efforts to create shared market functions, identify challenges impacting the success of the efforts, and summarize key learnings and helpful actions to inform current and future efforts for exploring shared market functions in the Northwest.

Organized Market Background

The first organized markets were launched in response to the transmission open access rules proposed by FERC in 1995 and finalized in 1996 (FERC Orders 888 and 889). The FERC Orders responded to direction from the 1992 Energy Policy Act to provide for greater deregulation of the electricity sector. There was a perception that vertically integrated

FERC Order 888: “The Commission’s goal is to remove impediments in the wholesale bulk power marketplace and bring more efficient, lower cost power to the Nation’s electricity consumers”

Published 1996

utilities -- those who own generation, transmission, and distribution -- were stifling independent power producers by not providing access to transmission and letting excess grid capacity go unused. FERC indicated its goal was: “to remove impediments to competition in the wholesale bulk power marketplace and to bring more efficient, lower cost power to the Nation’s electricity consumers.” FERC deemed competition a better restraint on unchecked assets or profits than a regulatory structure.

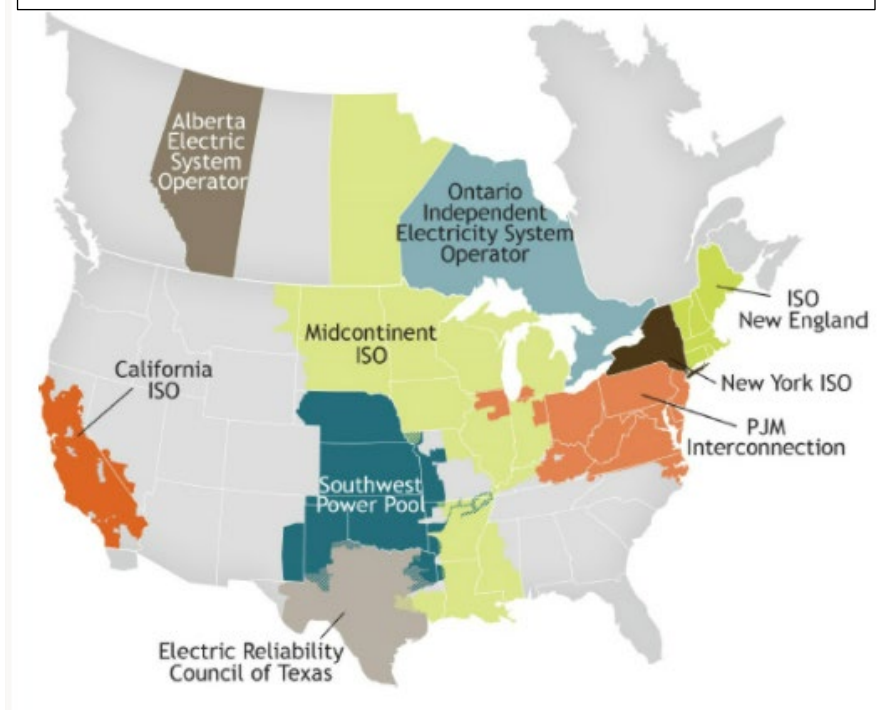
Order 888 encouraged, but did not require, transmission owners to form ISOs to manage the transmission network (neither ISOs nor RTOs own transmission lines). Order 2000 was issued in December 1999 and built on the foundation of Order 888 to encourage transmission owners to form RTOs by outlining the minimum characteristics of an RTO and identifying the minimum functions of an RTO.

Existing voluntary power pools, such as the New England and New York power pools that shared resources which were dispatched to ensure system reliability, were the earliest adopters of an ISO model. Currently, approximately 60% of the electricity supply and two-thirds of U.S. electricity consumers are served by seven ISOs or RTOs, predominantly in the Northeast, Midwest, and California. In the Pacific Northwest and the Southeast, however, the regulated utilities, publicly owned utilities, or federal Power Marketing Administrations own and operate transmission assets.

¹Independent System Operators (ISO) and Regional Transmission Organizations (RTO) are non-profit organizations established in geographic regions to manage the operations of the transmission grid. ISOs and RTOs are responsible for ensuring the reliability of the transmission grid by facilitating wholesale power markets, operating and monitoring transmission grid performance, and coordinating the operations of power generators in the region. An RTO performs the same type of business activities as ISO but has additional requirements and must be approved by the Federal Energy Regulatory Commission (FERC).

Of the seven U.S. ISO/RTOs, six are regulated by FERC. ERCOT is not regulated by FERC because it operates fully within Texas state lines and, therefore is not under FERC jurisdiction and is regulated by the Public Utility Commission of Texas.

Figure 4. Map of Existing RTOs and ISOs across North America



Not all of the existing organized markets started by performing all functions. Capacity markets were introduced in some areas in the late 1990s, and now four of the seven RTOs or ISOs in the U.S. offer capacity markets. SPP started with its transmission functions only and in 2007 added the real-time market administration and in 2009 added the day-ahead and ancillary services market option.

Figure 5. ISO/RTO Characteristics and Market Offerings

	Profile	Transmission Functions			Wholesale Energy Market Functions			
	ISO/RTO	Service Provider	Balancing Authority	Planner	Real-Time Market	Day-Ahead Market	Ancillary Services Market	Centralized Capacity Market
CAISO	ISO	✓	✓	✓	✓	✓	✓	
ISO New England	RTO	✓	✓	✓	✓	✓	✓	✓
Midcontinent ISO	RTO	✓	✓	✓	✓	✓	✓	✓
New York ISO	ISO	✓	✓	✓	✓	✓	✓	✓
PJM	RTO	✓	✓	✓	✓	✓	✓	✓
Southwest Power Pool	RTO	✓	✓	✓	✓	✓	✓	
ERCOT	ISO	✓	✓	✓	✓	✓	✓	

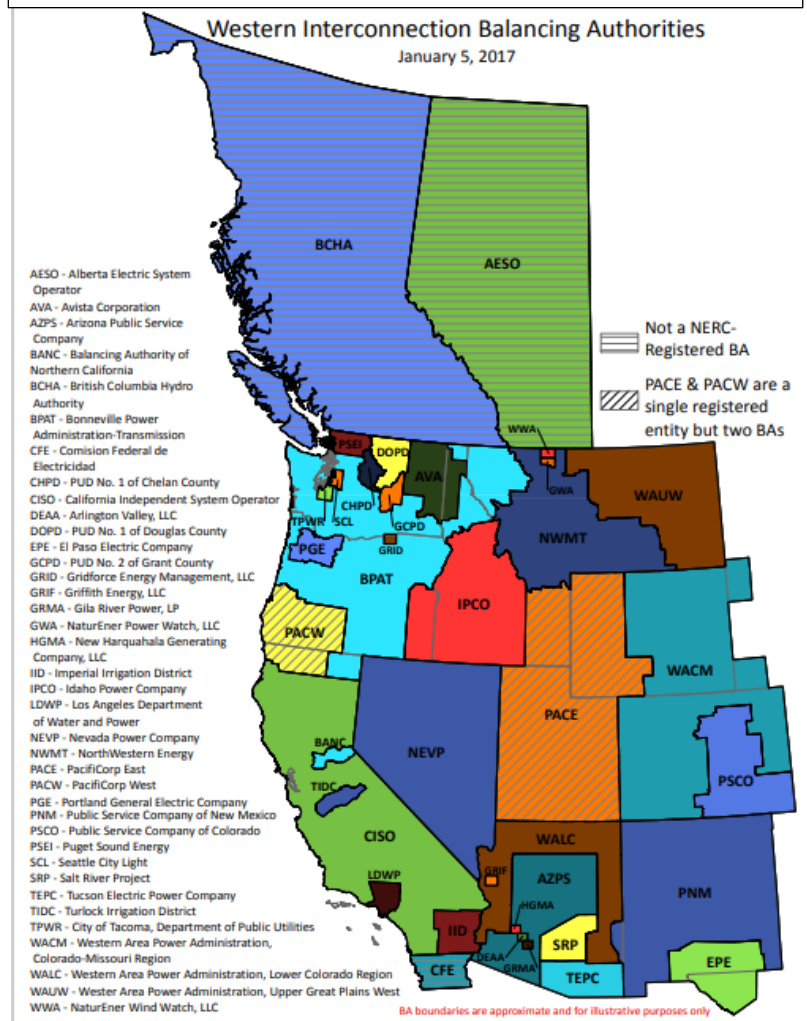
Pacific Northwest Background

The Northwest and non-CAISO portions of the Western Interconnection have focused on developing organized markets for decades. While several attempts have been made to create some form of organized market, the Western EIM, which provides entities the ability to voluntarily join into a real-time market administration, is the only organized market option currently available to Northwest utilities. Many factors have been attributed to the challenge of creating a market in the Northwest.

First, the Western Interconnection includes 38 Balancing Authority Areas (BAAs), with 17 BAAs in the 4 Northwest states. The ISO and RTO construct relies on a single BAA which would require many existing BAAs to give up that function. While there could be tremendous cost savings to the current BAAs and reduced regulatory risk associated with the obligation to meet NERC's mandatory reliability standards, it would involve significant change to internal operations and loss of control over reliability for the existing BAAs.

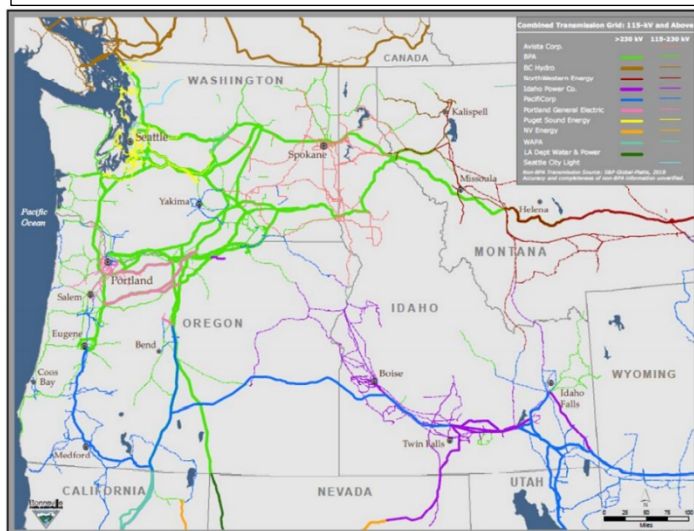
And, BPA, a non-jurisdictional federal power marketing administration, is the transmission provider and operator for approximately 75% of the high-voltage transmission in the Northwest. Approximately 50% of BPA's transmission revenue are from sales of transmission to entities that wheel through the BPA system. Unless mitigated in some way, efforts to create a single transmission rate within

Figure 6. Western Interconnection Balancing Authorities



the footprint would change how transmission costs are allocated which would result in some transmission customers paying more and some paying less. While cost shifts are not uncommon in the creation of a single transmission rate, the amount of revenue BPA receives from wheel throughs makes this a more prominent issue.

Figure 7. Combined Transmission Grid



Further, BPA's authorities and obligations are derived from federal statutes which may limit their ability to participate in organized markets and influence how their preference customers view the benefits and drawbacks of organized market participation. The 2005 Energy Policy Act answered the question that impacted IndeGO by providing Power

Marketing Agency Administrators the ability to decide whether to join an RTO/ISO and transfer control and use of its transmission system. But the statute also specifically states that joining an RTO/ISO does not relieve the Power Marketing Agency of any of its requirement under federal law and the statute precludes FERC from requiring that transmission customers convert existing physical transmission rights to financial rights. There are still many issues to be resolved, some of which were evaluated in BPA's 2019 Record of Decision regarding their authority to join the Western Energy Imbalance Market (Appendix D).

Additionally, hydropower is the dominant generating resource in the Northwest. In general, the prevalence, flexibility, and low operating cost make hydropower a good choice for balancing renewable resources. However, economic displacement opportunities between hydro-dominant utilities are limited compared to opportunities in thermally dominated markets which may impact the market footprint required to realize benefits. In addition, dispatch of hydro resources in an organized market must respect high priority non-power objectives, such as those for flood risk management and for mitigation of harm to endangered species.

Transmission lines (8000 MW of AC and DC interties) connecting the Northwest to California are a source of revenue for the Northwest and provide access to low-cost flexible generation for California. Rules associated with the allocation and use of these interties, however, have historically been challenging and would need to be addressed in any market design discussion.

Last, the 2001 Power Crisis coupled with the market disfunction in the CAISO's Power Exchange energy market had significant financial and reliability impacts across the West. The severe financial consequences of that market failure induced caution for many regional utilities about the risks associated with a centralized market construct.

Impact of Changing Conditions on the Market Landscape

Changes in supply and demand have many evaluating the benefits of increased electric utility cooperation and expansion of organized markets in the West.

Over the past two decades, voters and policymakers in many Western states have established clean electricity policies that require a significant increase in renewable energy resources and elimination of fossil fuel generation on the system. Most of the new renewable

“By aggregating individual state goals, this study estimates 2026 and 2034 Western clean energy penetration targets of 33% and 64%”
2019 Western Flexibility Assessment

energy resources are variable and require additional sources of flexible generation to balance the variability. And the Northwest's abundant hydropower system has experienced reduced flexibility due to additional restrictions from endangered species litigation and changes in streamflow patterns due to climate change. The loss of this on-demand energy and flexibility coupled with the increased need for balancing resources has encouraged the evaluation of methods to capture load diversity and share resource capabilities across the region more effectively. The EIM has provided a successful approach for integrating greater levels of variable resources.

Another impact from the policies to eliminate fossil fuel generation is a growing concern that the Western Interconnection may not have adequate resources to meet demand. Forward-looking analysis and actual conditions in the Summers of 2020 and 2021 have fueled the desire to formalize a Resource Adequacy program in order to maintain reliability. In addition, there is growing concern in markets across the country that there are inadequate incentives for market participants to provide sufficient capacity to meet

peak period demands. This so-called “missing money” problem is being addressed in other parts of the country by requiring market participants that are inadequate to forward-procure capacity.

Transmission-related trends also factor into the movement toward organized markets. As a result of federal and state policies promoting diversification of generation owners, there is an increase in the prevalence of independent power producers. Many of these power producers are developing renewable generation at locations distant from load centers and are pushing for greater access to the transmission system. Relatedly, to support increasing levels of renewable resources, transmission lines will be stretched to their maximum capacity and there is a need to ensure the most efficient use of existing transmission by using non-wires tools, such as demand response, before undertaking costly transmission expansion projects.

These trends have led to discussions regarding expanding CAISO and SPP’s platform and framework to extend a day-ahead market to create additional efficiencies in the dispatch of resources across the Western Interconnection. The Northwest Power Pool has led an effort to create a regional resource adequacy program to create efficiencies in sharing resource diversity to meet peak load needs. Last, several states across the West have passed legislation to study the benefits of an RTO (Oregon) or to require transmission owners to participate in an RTO by 2030 (Colorado and Nevada). While these initiatives are not the subject of this report, it is helpful to identify their potential for impacting regional discussions on market evolution.

III. Organized Market Functions

The ISO and RTOs that exist in other parts of the country perform several market functions defined by the North American Electric Reliability Corporation (NERC)ⁱ for the utility participants under an independent governance structure. While the market functions performed by the existing ISOs and RTOs are broad, many of those ISOs and RTOs started by only performing some of the market functions and added incrementally more functions.

Northwest utilities have evaluated several different proposals over the last few decades that attempted to centralize some or all of these market functions. In the early explorations, the focus was on centralized transmission planning and operations. In the last decade, the focus of efforts to expand cooperation in the Northwest has been on centralized electricity market operations. Figure 7, below, outlines the main functions of an organized market, identifying the functions addressed in key market initiatives over the last three decades.

As noted previously, the efforts in the Northwest to create a shared structure for these market functions have been challenging. It is partially due to the complex nature of creating a shared structure, but it is also due to the different resource and transmission profile of the utilities and the presence of BPA and its preference power obligations. While sharing each of the market functions provides benefits, it impacts parties differently. This dynamic can create specific challenges (see Figure 8). Understanding the benefits and challenges can help determine if a shared market function is worth pursuing.

Figure 8. Shared Market Function Benefits and Challenges

MARKET FUNCTION	BENEFITS	WHO BENEFITS	CHALLENGES
Shared Transmission Planning	<ul style="list-style-type: none"> • More accurate measure of transmission needs • Consideration of a broader set of capacity expansion alternatives 	<ul style="list-style-type: none"> • Existing users of transmission in potentially congested areas • Those with new transmission needs or transmission obligations 	<ul style="list-style-type: none"> • Cost allocation for new transmission
Single Transmission Service Provider	<ul style="list-style-type: none"> • Eliminates pancaked transmission rates • Provides a constant transmission rate across a trading footprint 	<ul style="list-style-type: none"> • Those in the geographic footprint that previously had multiple segments of transmission to load centers • Entity that needs access to transmission or new transmission 	<ul style="list-style-type: none"> • Cost shifts among users of transmission • Risk of devaluing existing transmission rights • Risk that those that do not need transmission will pay a share of new transmission built
Single Transmission Operator	<ul style="list-style-type: none"> • Broad visibility into the system allows for efficient and reliable use of the system 	<ul style="list-style-type: none"> • Users of transmission system; reduces curtailments, congestion and new investments 	<ul style="list-style-type: none"> • BPA's legal authority to transfer control of assets
Single Balancing Authority	<ul style="list-style-type: none"> • Reduces seams and need to manage interchange and area control error 	<ul style="list-style-type: none"> • Existing Balancing Authority Areas can reduce administrative costs of operating BAA • Efficiency associated with load and resource diversity • Existing Balancing Authority Areas cede mandatory reliability obligations and eliminate reliability regulatory risk 	<ul style="list-style-type: none"> • Existing Balancing Authority Areas may want to maintain control over reliability • Significant staffing shifts/changes for existing Balancing Authority Areas
Common Resource Adequacy Standards	<ul style="list-style-type: none"> • Ensures a reliable system within an established risk tolerance • A common reserve margin allows utilities to develop comparable resource plans • Opportunity to share capacity and capture regional diversity • Associated operational program for sharing may provide other efficiencies 	<ul style="list-style-type: none"> • Planning reserve requirements on the overall system are reduced • Entities that have excess capacity have increased capacity sales opportunities 	<ul style="list-style-type: none"> • Common adequacy measure and standard could be higher or lower than others had individually • Requires consistent capacity accreditation of resources, which could be higher or lower than others had individually • Operational component needed to capture regional diversity

Market Operator	<ul style="list-style-type: none"> • Single dispatch of generating resources produce efficiency and lower production costs 	<ul style="list-style-type: none"> • Energy purchasers/customers • Generators have fewer transaction costs if they participate in the market • Variable Energy Resources can be more easily integrated in a centralized market than a bilateral market 	<ul style="list-style-type: none"> • Initial participation involves significant technology and staff investment • Market rules are complicated and will require continual revision • Dedicated staff are needed to manage market operator processes
------------------------	---	---	--

IV. Western Initiatives to Expand Coordination

The earliest coordination effort in the Northwest was initiated in the mid-1990s mostly in response FERC's initiation of a rulemaking to ensure open access to the transmission system. There was a general push toward deregulation in other markets with monopolies such as the airline, trucking, and railroad industries. The validity of the "natural monopoly and regulation structure," was brought into question by the rise of the free market in these similarly situated industries.

Specifically, for the electricity sector, the passage of the Public Utility Regulatory Policies Act (PURPA) in 1978 required electric utilities to buy electricity generated from non-utility small power producers at rates equivalent to the utility's own generation or procurement costs. As these independent power producers came online, the inadequacies of the transmission system across the U.S. were revealed. Vertically integrated utilities -- utilities who own generation, transmission, and distribution and who own most of the transmission lines in the U.S. -- were perceived to be stifling independent power producers by not providing access to transmission and letting excess grid capacity go unused.

1995 – 1998: IndeGO

FERC initiated its rulemaking in 1995 and in the same year Northwest utilities launched an initiative called IndeGO to provide efficient, non-discriminatory open transmission access by creating a single transmission provider, balancing authority area, and security coordinator. In late 1996 and 1997, 21 parties signed a Memorandum of Understanding (MOU) and working groups developed tariff language, alternative structural designs and analysis on impacts to transmission customers.

Figure 9. Market Development Activity 1978-1998		
EVENTS	YEAR	NORTHWEST ENTITIES MARKET DEVELOPMENT ACTIVITY
Public Utility Regulatory Policies Act	1978	
Energy Policy Act	1992	
FERC issues NOPRs for 888 and 889	1995	IndeGO begins
FERC Orders 888 889 PJM fully functioning ISO, ERCOT ISO launched	1996	IndeGO MOU
CAISO founded, ISO New England founded, NY ISO authorized by FERC	1998	IndeGO ends

The IndeGO process was challenged by three primary issues. First, the IndeGO proposal to move to a single transmission rate resulted in many MOU signatories seeing significant increase in transmission costs while others had significant decreases. Second, the scope of participating transmission was expanded to include

lower-voltage transmission lines. Smaller transmission owners, mainly public power, were concerned they would be covering the costs of large transmission expansion, mainly for the benefit of investor-owned utilities. Finally, BPA drafted a legal opinion that determined federal legislation would be required for BPA to sell, lease, or transfer operating control of BPA's transmission system to another entity. Because of the challenges, MOU signatories began to withdraw from the process, and the initiative eventually ended.

2002– 2006: RTO West/Grid West

After FERC's Order 888 in 1996, many parts of the country engaged in restructuring activity. Many states moved to develop retail competition, generation plants were divested by electric utilities, mergers occurred among traditional electric utilities, the number of power marketers and independent generation developers entering the marketplace increased, and ISOs were established as managers of large parts of the transmission system. From FERC's perspective, there was evidence that vertically integrated electric utilities were inadequate to support the efficient and reliable operation necessary for the continued development of competitive electricity

Figure 10. Market Development Activity 1999-2006		
EVENTS	YEAR	NORTHWEST ENTITIES MARKET DEVELOPMENT ACTIVITY
FERC Order 2000 - NOPR NY ISO launched	1999	
	2000	RTO West begins
West Coast Power Crisis MISO formed PJM designated as an RTO	2001	
FERC Standard Market Design NOPR	2002	RTO West filing at FERC
	2003	
250 MW wind capacity in BPA's BAA SW Power Pool achieved RTO status	2004	RTO West transitions into Grid West,
FERC Issues Order Terminating SMD Rulemaking MISO begins market operations Energy Policy Act	2005	
	2006	Grid West ends; Columbia Grid/Northern Tier begin

markets. Confidence in the procedural separation of merchant and transmission functions of vertically integrated entities was insufficient to ensure fair competition. FERC Order 2000, finalized in December 1999, encouraged utilities and transmission owners to join RTOs to create an organized competitive marketplace, required filings relative to their efforts to participate in an RTO, and codified minimum characteristics that a transmission entity must satisfy to be considered an RTO.

The RTO West Regional Representatives Group, which included all the investor-owned utilities (IOUs) in the region, BC Hydro, and BPA, was formed in 2000 and charged with recommending approaches for the successful formation of an RTO in the Northwest. The group made two major filings with FERC in 2001 and 2002 that outlined proposals for governance, congestion management, transmission planning and expansion, and market monitoring. In addition, the group proposed to create an independent for-profit transmission company, called TransConnect, that would own and operate interstate transmission facilitates and participate in RTO West as a single transmission owner.

While FERC approved the creation of TransConnect and largely approved of other elements of the RTO West group's proposal, the 2001 power crisis and the severe market disfunction that occurred in the CAISO market during that time impacted the process. In response to the California situation, FERC launched a rulemaking process called Standard Market Design in which they tried to find rules that would ensure competition, non-discrimination, and transparency so that a crisis like California could not happen again. They reserved approval on the RTO West market design until completion of the Standard Market Design rulemaking.

The impacts of the California market disfunction were felt throughout the West and it led some parties to be concerned about creating a California-style market in the Northwest. In 2002, a coalition of public power entities was formed, called Northwest Power Works, to oppose RTO West and the FERC Standard Market Design proposed rule. In addition, public power was concerned that the projected costs of RTO West were too high, and that increased FERC jurisdiction could lead to a loss of local control.

Similar to the concerns under IndeGO, RTO West was challenged with how to convert existing physical transmission rights into financial transmission rights and mitigate the resulting cost shifts among potential market participants. These concerns were combined with BPA's desire to have veto authority within the governance structure, which was too much for some participants to continue their interest in the initiative.

In 2004, RTO West was rebranded as Grid West. The common market framework was removed from the scope and the focus was on a single transmission planning, service provider, and operations function. Grid West received a declaratory order from FERC that its proposal would satisfy FERC Order 2000 and not have to qualify as an RTO. In 2005, a number of public power agencies and municipal utilities that were uncomfortable with placing grid operations in the hands of an independent entity formed a group called the Transmission Issues Group to propose an alternative to Grid West. BPA and others attempted a compromise plan, but it failed to gain support. Ultimately, there was no consensus to create a single transmission service provider or transmission operator. However, two different transmission planning organizations were formed: Northern Tier Transmission Group and Columbia Grid. These two organizations merged into Northern Grid in 2020.

2006-2012: Market Studies

From 2006 through 2012 a series of events and studies created a focus on the economic dispatch practices in markets and the potential economic and renewable integration benefits gained through more efficient dispatch of resources. In 2006, as required by the Energy Policy Act of 2005, FERC convened regional joint boards to analyze current practices and make recommendations. The joint board for the West recognized the potential for improved dispatch through consolidation of some subregions in the Western Interconnection and the potential for improving coordination of dispatch between control areas within the hour. The joint board recommended studies to assess the value of larger control areas for improving the dispatch of renewables such as wind, and studies to address the problems of control areas scheduling imports and exports within the hour. Studies were conducted by WECC, a group of state regulators, and FERC outlining the costs and benefits, the improved visibility and situational awareness benefits, and improved transmission flows of an EIM.

2012 - 2016: Northwest Power Pool Market Assessment and Coordination Committee Initiative

In March 2012, the Northwest Power Pool Members (NWPP MC) launched the MC initiative to evaluate market and non-market solutions to bring enhanced efficiency and reliability to the Northwest Power System. Participants included all IOUs, Powerex, BPA, and several large public power utilities. In early 2013, PacifiCorp announced plans to work with the CAISO to form the EIM but stayed in the NWPP MC process as well.

The group focused on the development of a market design for a centralized within-hour optimization and dispatch using a 5-minute security constrained dispatch model and issued an Request for Proposal (RFP) for a market operator. In early 2015, the group received responses to their RFP that exceeded cost expectations. This proved especially challenging given that the CAISO had launched the EIM with PacifiCorp in 2014 and was offering a lower cost to entry than the costs associated with the NWPP MC market design.

In response to the high-cost bids received for a market operator, the NWPP MC participants transitioned in the final year to development of an automated, centrally cleared 15-minute market, also known as the centrally cleared energy dispatch market paired with a regulation reserve sharing group and other regional tools. The design was intended to be less expensive, easy to implement, and would rely on as-available transmission. Substantively, the group ran into issues about expected high use of BPA's transmission system which raised concern about cost allocation to BPA's customers and pancaked transmission rates for those not directly connected to BPA's system. In addition, the decision-making structure that required consensus on all issues amongst all parties made progress difficult and there were concerns that entities had different long-term goals.

In 2015, Puget Sound Energy, Portland General Electric, Balancing Authority of Northern California, and Idaho Power decided to join the CAISO EIM market. The remaining participants of the MC initiative ended the effort in 2016.

Figure 11. Market Development Activity 2012-2018		
EVENTS	YEAR	NORTHWEST ENTITIES MARKET DEVELOPMENT ACTIVITY
4750 MW wind capacity in BPA BAA	2012	NWPP MC Initiative begins
Mountain West Transmission Group Formed	2013	PacifiCorp and CAISO announce plans to jointly develop an EIM
	2014	EIM officially begins
Public Service of Colorado, Black Hills, Colorado Springs and Platte River Power Authority file joint dispatch agreement	2015	PSE will join EIM; still participate in NWPP MC PGE, BANC and Idaho Power withdraw from NWPP MC initiative NV Energy enters EIM PacifiCorp and CAISO announce MOU for PacifiCorp to become a Participating Transmission by 2017 California SB 350 passed
	2016	NWPP MC Initiative concludes APS and PSE enter EIM SB 350 final governance proposal presented at joint state agency workshop. SB 350 study results submitted to the CA governor's office
Mountain West Transmission Group pursues membership in SPP's RTO	2017	PGE enters EIM
Public Service of Colorado and Black Hills Energy withdraw from Mountain West Transmission Group pursuit of SPP RTO.	2018	Powerex, Idaho power Company enter EIM SB350 Regional Energy Market concept fails to get approved by the CA legislature Mountain West ends joint activity

2014 - Present: Western EIM

PacifiCorp became interested in the concept of an EIM in approximately 2010 or 2011. PacifiCorp was an active participant in the NWPP MC initiative and simultaneously explored the benefits of an EIM with the CAISO. In February 2013, CAISO and PacifiCorp signed a memorandum of understanding to pursue an EIM. Specifically, the EIM would be a voluntary market that provides a 5-minute security constrained dispatch in the EIM Entity Balancing Authority Area. In March 2013, the ISO released a [study](#) of PacifiCorp-ISO EIM benefits conducted by Energy and Environmental Economics (E3), identifying interregional and intraregional dispatch savings, reduced flexibility reserves, and reduced renewable energy curtailment as the benefits of the EIM.

CAISO and PacifiCorp launched public processes to make the tariffs changes necessary to implement the EIM. The process through FERC was rather quick with FERC conditionally accepting the tariff revisions required for the EIM in 2014. PacifiCorp began operation in November 2014.

CAISO initiated a process in late 2014 to establish a governance structure for the EIM. The process concluded in June 2015 with a recommendation to create the EIM Governing Body.

NV Energy began operations in the market in December 2015, Puget Sound Energy in October 2016 and utilities have joined every year since. The Western EIM footprint now currently includes portions of Arizona, California, Idaho, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming, and extends to the border with Canada and has 83% of the load in the Western Interconnection either in the market or committed to join the market.

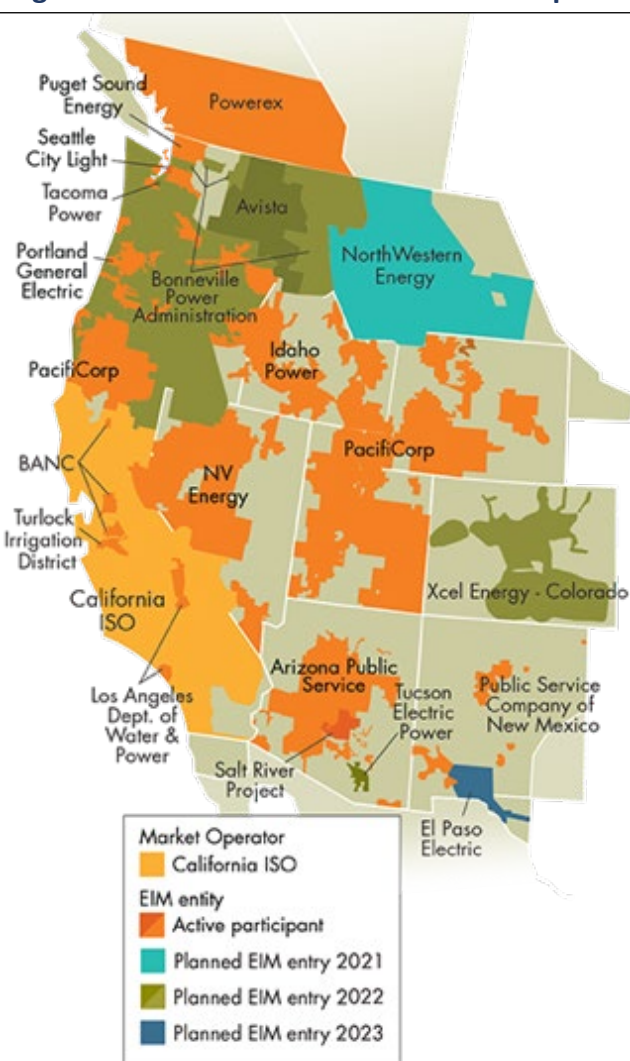
Other Efforts

Appendix A and B include information about PacifiCorp’s effort to become a Participating Transmission Owner in the CAISO and the efforts of the Mountain West Transmission Group. Because these efforts were not Northwest focused, only a brief paragraph on each is offered below. However, those processes are instructive because they faced many of the same issues that have impacted the Northwest efforts.

In 2015, PacifiCorp launched an effort to join the CAISO as a full Participating Transmission Owner. Significant work was done to evaluate the benefits of this action and options for an independent, multi-state approach to governance for the CAISO were explored. States were concerned about the impact of an expanded CAISO on individual state energy policy. Ultimately, the inability to get full support for a governance proposal and the high cost for PacifiCorp to join resulted in PacifiCorp withdrawing its interest in 2018.

In 2013, the Mountain West Transmission Group was formed to create a single transmission tariff among the parties. The group made significant progress on the single tariff but also evaluated and found that the net benefits of joining SPP’s RTO market were superior relative to the implementation of a single transmission tariff. Public Service of Colorado (PSCo) was an important member; however, it ended its participation citing concerns about regulatory support, upward pressure on project costs at SPP, declining potential for expansion of members due to CAISO’s EIM, and SPP east members pushing back on the terms of the agreement. The loss of PSCo impacted the overall net benefits for the remaining members and their effort ended in 2018. The remaining members launched the SPP Western Energy Imbalance Service in 2020.

Figure 12. EIM Current and Future Participants



V. Key Takeaways and Proposed Next Steps

TAKE-AWAYS:

- **All initiatives struggle over issues of transmission cost allocation, governance and cost relative to benefits**
 - Transition to a single transmission rate results in some paying more and some paying less. Without mitigation, this can be a barrier to entry for many.
 - Cost allocation methods for new transmission are complex and may increase costs to those that do not need new transmission.
 - It is challenging to develop a new governance structure due to the diverse interests of market participants, regulators and stakeholders.
 - Higher costs, uncertainties and regulatory risks have impacted the ability to develop a positive business case.
- **The Northwest includes unique considerations and interests that further complicate the challenging issues of transmission cost allocation, governance and costs relative to benefits**
 - BPA's extensive transmission ownership creates cost shift considerations that will impact any proposals that involve sharing of transmission.
 - Assurances are needed that hydro resources can retain the ability to meet nonpower obligations and are valued appropriately in the market.
 - The large number of non-jurisdictional public power utilities impacts the openness and willingness to engage in a FERC jurisdictional market.
 - There are 17 Balancing Authority Areas in the four Northwest states that would all have to agree that the benefits of giving up their Balancing Authority Area outweigh the costs.
- **The Western EIM was formed with a single entity and has expanded rapidly because of its incremental, voluntary nature and reliance on as available, free transmission.**
 - EIM was designed by a single entity and established momentum with a few key early additional members.
 - The cost to join the EIM is relatively low because it is a feature added on to an existing infrastructure.
 - The market operates on as available, free transmission avoiding issues of transmission use and cost allocation.
 - The decision to join, exit, and participate is voluntary, which has alleviated certain governance concerns that otherwise may have challenged its success.
 - Parties are able to act individually, without the need to achieve consensus with multiple stakeholders.
 - Parties are able to consistently demonstrate that the benefits exceed the costs.
- **The changing resource mix and load profiles in the West provide new reasons to evaluate increased market coordination**
 - Many Western states have passed legislation with significant clean electricity goals, which will further increase renewable resources on the system and the associated need for transmission and system flexibility.
 - As renewable resource penetration continues and traditional thermal resources retire in the West, there will be an increased need to capture load and generation diversity across the region and share resource capabilities.
 - The changing system coupled with changing demand due to climate and electrification support an efficient use of the transmission system and integration of demand-side solutions.

- **Success is more likely when there are regionally determined benefits rather than federal or other policy mandates**
 - Policy level discussions and analysis around markets have informed regional collaborations. However, direct engagement or directive by policy makers has negatively impacted progress.
 - FERC's perceived overreach in the early 2000s with Standard Market Design negatively impacted RTO West discussions and heightened jurisdictional concerns of public power.

PROPOSED NEXT STEPS:

- **Seek a long-term outcome that benefits the Western Interconnection while minimizing or mitigating harm to individual entities**
 - Establish overarching objectives and long-term goal for market evolution that provides benefit for the Western Interconnection while minimizing or mitigating impact to individual entities.
 - Identify objective criteria to evaluate the alternatives and define the path forward.
 - Develop a roadmap that will achieve the long-term goal, specifically identifying market functions that provide the highest reward relative to risk.
- **Identify any potential barriers for key parties to expanded market coordination**
 - Barriers for Bonneville participation have arisen in several of past initiatives.
 - Bonneville assessed several issues in the 2019 EIM Record of Decision related to Bonneville's authority to join the Western EIM; these issues should be evaluated in the context of broader market expansion.
 - Other market participants should also identify potential barriers.
 - Early identification increases likelihood of success by allowing time to address issues in the design of the market and/or legislatively, if needed.
- **Explore options early for tackling the hardest issues associated with shared transmission**
 - Explore methods used in other markets to minimize or mitigate the increase or shifts in costs to some entities associated with the shared use of transmission.
 - Evaluate regional cost allocation methods and their ability to address concerns about the cost of new transmission.
 - Assess other impacts of transitioning from contract path to flow-based use of transmission.
- **Recognize and work to align the varied regional interests around market coordination**
 - Proactively identify the key interests and risks to public power, investor-owned utilities and independent power producers.
 - Ensure BPA preference customers maintain preference value.
 - Recognize and minimize participant risk, including shareholder risk.
 - Meaningfully engage with state regulators and key stakeholders to ensure their support for final outcome.
- **Establish an independent and objective governance framework early to be used as a foundation for decision-making throughout the effort.**
 - Ensure any collaborative process is managed by a neutral entity empowered to hold the participants accountable to their stated objective.
 - Ensure qualified resources with relevant technical, operational, and market experience are empowered as champions to develop solutions.
 - Establish rules to that ensure market participants have a commitment to the market outcome and are not involved just to play defense.

VI. Appendix A: Market Functions and Efforts to Share

a. Shared Transmission Planning

What is shared Transmission Planning and what are the potential benefits?

- Transmission planning refers to activities related to making decisions on investments in existing transmission infrastructure and expanding transmission capability to accommodate new load and generation in a manner consistent with FERC requirements.
- A shared transmission planning function will:
 - Rely on common data, assumption, and methodology
 - Allow for easier identification of regional transmission projects
 - Create a single stakeholder forum to efficiently identify and resolve issues
 - Eliminate duplicative administrative processes
 - Facilitate compliance for FERC requirements

Which regional efforts attempted to create a shared Transmission Planning function?

- IndeGO, RTO West, Grid West, Columbia Grid, Northern Tier Transmission Group, Northern Grid

What were the results?

- Consolidated transmission planning was part of RTO West's scope to establish a regional transmission organization in 2000.
- The scope of RTO West was narrowed and rebranded as Grid West in 2004 and consolidated transmission planning was retained as part of the scope.
- The Grid West initiative ended in 2006 due to concerns about governance, costs and FERC jurisdiction, but there continued to be broad agreement on the value of consolidated transmission planning.
- Columbia Grid was proposed in 2006 as a non-profit corporation comprised of members from BPA, public power, and some IOUs.
- The Northern Tier Transmission Group was proposed in 2007 with similar scope as Columbia Grid but comprised of IOU entities in Oregon, Washington, Idaho, Montana, Wyoming, California, and Utah.
- In 2020, Columbia Grid and Northern Tier merged to become Northern Grid with members that include BPA, IOUs, and consumer-owned utilities located in Oregon, Washington, Idaho, Montana, Wyoming, California, and Utah.

b. Shared Resource Adequacy Standard

What is a Shared Resource Adequacy Standard and what are the potential benefits?

- A regional adequacy objective that all participants agree to comply with that ensures total available capacity over a specific period will be available to sufficiently serve demand. Generally determined through a maximum loss of load expectation (LOLE) on a forward basis (the amount of capacity and energy that needs to be available to meet desired reliability targets at any time during the day, over a multi-year period.)
- Potential benefits include increased reliability, cost savings, improved visibility/situational awareness/coordination among participants.

Which regional efforts attempted to create a shared Resource Adequacy Standard?

- None of the regional efforts to date have focused on a shared Resource Adequacy program.
- RTO West “Stage 2” filing indicated that regional mechanisms for Resource Adequacy already existed in the region and that FERC’s Standard Market Design should “recognize the primacy of these mechanisms.”
- In 2019, a group of utilities formed an effort organized under the Northwest Power Pool to evaluate the potential for a regional Resource Adequacy program.

c. Shared Transmission Service Provider

What is a Shared Transmission Service Provider and what are the benefits?

- A Transmission Service Provider (TSP) is an entity that develops and administers the transmission tariff and provides Transmission Service to Transmission Customers
- A single TSP will include a single tariff that:
 - Allows for consistently applied open access principles for transmission access
 - Creates non-pancaked rates pursuant to a single, unbundled, footprint-wide tariff
 - Constructs pricing policies that will allow for efficient use
 - Allows for the development of a consistent set of transmission products that can be purchased from a single entity

Which regional efforts attempted to create a shared Transmission Service Provider?

- IndeGO, RTO West, and Mountain West Transmission Group (MWTG)

What were the results?

- IndeGO
 - A draft tariff pursuant to a single, footprint-wide tariff was developed with pricing policies across several “access areas” that promoted fair and efficient use, but it was not finalized.
 - The tariff was not finalized due to IndeGO losing momentum.
- RTO West
 - RTO West proposed to create access to regional facilities under its control through a single tariff
 - RTO West Stage 1 proposal was approved by FERC in 2001
 - FERC approved nearly all elements of the “Stage 2” filing in October 2002 but deferred on elements related to the market design until the final stage of the Standard Market Design rulemaking.
 - Strong opposition from public power to the organized market aspects of RTO West led to the rebranding to Grid West in 2004 and the eventual collapse of the entire effort in 2006.
- Mountain West Transmission Group
 - Substantial progress was made in developing a single multi-company transmission tariff that addressed issues of cost shifts and allocation of costs between load and imports/exports.
 - A full RTO was explored as potentially providing greater net benefits, but the group lost critical mass to make the full RTO happen and did not implement the multi-company transmission tariff.

d. Shared Transmission Operator

What is a Shared Transmission Operator and what are the potential benefits?

- The transmission operator is the entity responsible for the reliability of the transmission system and directs the operations of the transmission facilities.
- Sharing transmission operations across a larger footprint allows for greater visibility of interconnected transmission facilities across the region and for greater control over operational actions that relieve constraints and improve reliability.

Which regional efforts attempted to create a shared Transmission Service Operator?

- IndeGO, RTO West, Grid West

What were the results?

- IndeGO
 - IndeGO intended to operate a single Balancing Authority Area, operate OASIS, and reserve and schedule the use of the transmission system.
 - Several alternatives were evaluated, and an Independent Grid Scheduler was proposed by Public Generating Pool, but the process had lost momentum and parties were not interested in the proposal.
- RTO West/Grid West
 - RTO West attempted to consolidate regional operations into single Balancing Authority Area.
 - Grid West emerged from RTO West in 2004 and focused on creating an independent grid operator.
 - Public power concern about placing grid operations into the hands of an independent entity and proposed the Transmission Issues Group (TIG) that focused on limited improvements.
 - BPA proposed a “Convergence Plan” as a compromise between Grid West and TIG but could not get enough support and the effort ended in 2006.

e. Shared Balancing Authority Area Operator

What is a shared Balancing Authority Area Operator and what are the potential benefits?

- Balancing authority operations ensures that ancillary services are provided to maintain load, interchange and generation balance within the Balancing Authority Area, and to support Interconnection frequency in real time.
- Sharing balancing authority functions across multiple balancing areas allows for diversity in load and generation to be considered in the provision of ancillary services which will reduce costs and result in more efficient operations.

Which regional efforts attempted to create a shared Balancing Area Operator?

- IndeGO, RTO West, Grid West

What were the results?

- IndeGO
 - IndeGO intended to monitor and provide backstop ancillary services and operate a reserve sharing pool, but the effort lost momentum.
- RTO West/Grid West
 - Scope included setting up the region as a single load control area.

- ACE Diversity Interchange (ADI) was identified as a reliability tool to allow balancing areas to pool Area Control Errors (ACE) to take advantage of control error diversity. This was eventually implemented in 2007.

f. Market Operator -- real-time, day-ahead transactions

What is a Market Operator for real-time and day-ahead transactions and what are the potential benefits?

- A single independent entity that manages the tariff and operation of a security constrained economic dispatch model and manages a functional model as an interface point of reliability functions with commercial functions.
- Benefits include operational efficiencies, cost savings, integration of VERs, and reliability.

Which regional efforts attempted to create a Market Operator?

- RTO West, NWPP MC Initiative, Western EIM and SPP WEIS

What were the results?

- RTO West
 - RTO West intended to establish a common market framework consistent with the Standard Market Design discussed in FERC's NOPR
 - The common market framework portion of RTO West was removed from the scope as RTO West transitioned to Grid West
 - As a result of the 2001 power crisis, many entities (especially public power) were concerned about changing from bilateral trading to a common market framework.
- NWPP MC
 - Initial proposal was a 5-minute security constrained economic dispatch market.
 - After the high-cost proposal from the RFP was rejected, a scaled-back, automated, centrally cleared 15-minute energy dispatch market (CCED) was proposed.
 - The NWPP MC initiative ultimately did not succeed for a few reasons:
 - Transmission: not all entities could reach Mid-C without wheeling/incurred costs to access transmission
 - Governance: concerns/disagreements around whether governance should allow for future expansion of the market
 - Trust/Coalition of the willing: lack of trust amongst participants and true buy-in to achieving the market
 - Competition: EIM was another viable option for MC initiative participants
- Western EIM
 - Western EIM was approved by FERC and began operation in November 2014.
 - Shared governance model with an Independent EIM board and the ISO Board of Governors, who are appointed by the CA governor, for those rules that apply to EIM entities and participants
- SPP WEIS
 - SPP WEIS market was approved by FERC and began operation in February 2021.
 - Governed by the independent SPP board and a Western EIS members committee

g. Participation in an existing RTO/ISO

What is involved in joining an existing RTO/ISO and what are the potential benefits of joining?

- Entities located outside an ISO/RTO could become full Participating Transmission Owners (PTOs). This means the ISO/RTO would assume operational control over the transmission facilities of the PTO and would administer these facilities in accordance with its FERC-approved OATT. The PTO would be given access to the full services of the ISO and would operate under the ISO/RTO expanded balancing authority area.

Who attempted?

- Mountain West Transmission Group explored joining SPP
- PacifiCorp explored joining CAISO

What were the results?

- Mountain West Transmission Group lost critical mass to make it financially viable to join.
- PacifiCorp's attempt to joint CAISO
 - Operational benefits studies were conducted.
 - Principles for regional ISO governance were developed, but not supported by all stakeholders.
 - Legislation required to move forward with regionalization failed to materialize.
 - California entities had concern about the environmental effects of PacifiCorp joining and the potential cost impacts associated with new transmission.

VII. Appendix B: Chronology of Market Initiatives

a. 1995 – 1998: Independent Grid Operator (IndeGO)

Scope

In 1995, an initiative to create an Independent System Operator (ISO) was launched. The intent of the initiative was to provide efficient, non-discriminatory open transmission access that would facilitate a competitive generation market within a secure, reliable transmission network by:

- Acting as Security Coordinator
- Operating a Single Balancing Authority Area
- Evolving into a Single Transmission Provider
- Monitoring and providing backstop ancillary services
- Operating an OASIS and scheduling use of the system
- Evolving from "Company" transmission rates to "Access Area" rates
- Operating a reserve sharing pool

Participants

MOU Signatories

- | | |
|------------------------------------|----------------------------------|
| ● Idaho Power (7/96) | ● Puget Sound Energy (7/96) |
| ● Washington Water Power (7/96) | ● Sierra Pacific Power (7/96) |
| ● Montana Power (7/96) | ● Tacoma Public Utilities (9/96) |
| ● PacifiCorp (7/96) | ● Chelan Co. PUD (10/96) |
| ● Portland General Electric (7/96) | ● BPA (11/96) |

- Snohomish Co. PUD (12/96)
- Grant Co. PUD (1/97)
- Seattle City Light (1/97)
- Northern Lights (2/97)
- Tri-State G&T Association (2/97)
- Platte River Power Authority (2/97)
- Public Service of Colorado (2/97)
- West Plains Energy (3/97)
- WAPA - Rocky Mtn Region (3/97)
- Basin Electric Power Co-op (3/97)
- Colorado Springs Utilities (3/97)

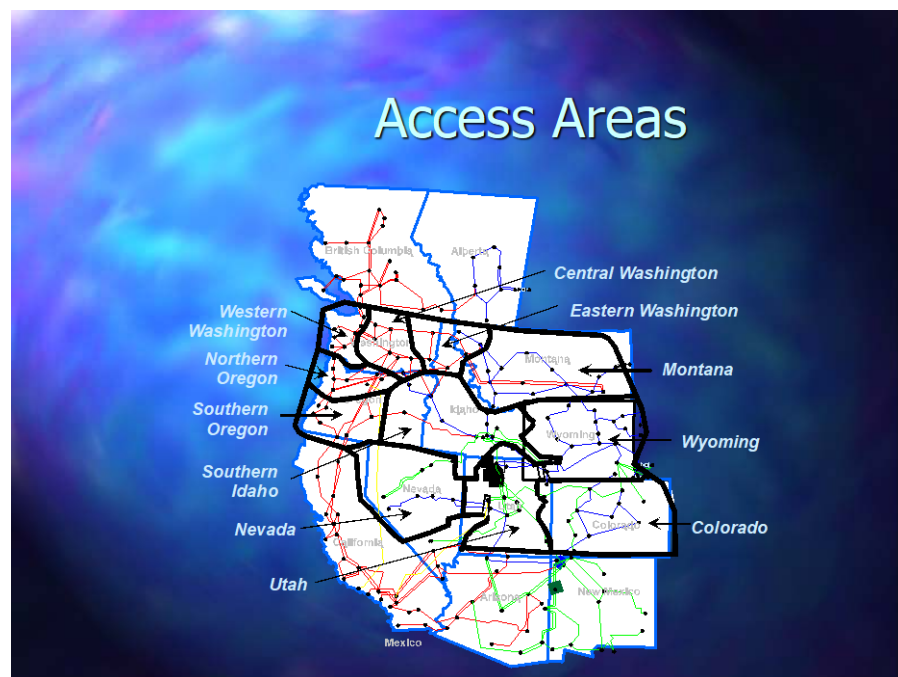
Additional Contributors: PNUCC provided facilitation and legal analysis.

Drivers

- General political interest in deregulation of industry, where possible.
- 1992 Energy Policy Act mandated open access to transmission for wholesale transactions and authorized FERC to develop the “rules of the road.”
- FERC’s goal to remove impediments to competition in the wholesale bulk power marketplace as captured in the Notice of Proposed Rulemaking and final FERC Orders 888 and 889.

Process

- In June 1995, PNUCC initiated a process (“Regional Review”) with member utilities to evaluate the impacts of FERC’s open access directives and to make recommendations on how to proceed.
- In February 1996, the Regional Review’s Steering Committee recommended the formation of an independent grid operator (IndeGO) that would be regulated by FERC and include the transmission assets of BPA and other owners of major transmission assets in the region.
- Membership would be voluntary, but every effort would be made to enlist wide participation.
- By March 1997, twenty-two entities within the Pacific Northwest and Northern Rockies signed a Memorandum of Understanding (MOU) to develop IndeGO.
 - The eleven “Access Areas” within this footprint would have unique transmission rates.



- In 1996-1997, MOU signatories' staff formed work groups to develop tariff language, alternative structural designs and analysis on impacts to transmission customers.
 - Tariff and other legal documents were developed and vetted at FERC, but none were finalized.
 - Articles and Bylaws
 - Transmission Control Agreements
 - Integration Agreements
 - Tariff and Service Agreements
 - Entity Charter
 - Several alternative structural designs were developed and proposed, but no decision was made on the path forward.
 - A Transmission Coordination Agreement (TCA) would operate the grid and price transmission in a way that is as close as possible to a one-owner model.
 - An Independent Grid Operator– light (IGO-L) would operate and plan the transmission system, but ownership and transmission rates would be unchanged.
 - An Independent Grid Operator (IGO-O) would operate, plan and own the transmission system and create two separate organizations – one owning transmission and the other owning only generation. This was the preferred alternative by most of the work group.
 - A Transco would include as much of the transmission control and management responsibility as possible and would be fully independent of owners of generation and distribution facilities.
 - An Independent Grid Scheduler (IGS) was proposed by the Public Generating Pool towards the end of the process. The IGS alternative was somewhere between the TCA and the IGO-L.
 - Analysis on rate impacts for transmission customers determined that there were likely cost shifts between transmission customers.

Cost Shifts

With Price Cap
{ cap affected }

Company	Inc/Dec	m/kWh	Company	Inc/Dec	m/kWh
Basin	20.0%	1.2	PGE	0.4%	0.0
BPA	5.5%	0.3	PSCO	{ 21.8%	{ 0.8 }
Chelan	{ 21.8%	0.7	Puget	-12.8%	-0.7
Cheyenne	-40.3%	-5.0	Seattle	{ 21.8%	{ 0.8 }
Colo. Spr.	{ 21.8%	{ 0.8 }	Sierra	-1.9%	-0.1
Grant	{ 21.8%	{ 0.8 }	Snohomish	-19.4%	-1.3
Idaho	{ 21.8%	{ 0.6 }	Tacoma	{ 21.8%	{ 0.8 }
Montana	-2.1%	-0.2	Tri-State	-58.3%	-8.5
Northern Light	-41.3%	-2.7	WWP	15.1%	0.6
PacifiCorp	-4.4%	-0.3	West Plains	-3.8%	-0.2
Platte	-5.6%	-0.3	WAPA	-58.4%	-9.8

- A public comment meeting was held in January 1998 that shared progress on the development of legal documents and cost shift analysis.
 - The material for this meeting includes a proposed scope for IndeGO that appears consistent with the Transco alternative.
 - The material for this meeting indicates that FERC and state filings were planned for Q2 1998, but this never happened.

Challenges

- The IndeGO proposal to move from individual “Company” rates to “Access Area” rates resulted in significant cost shifts for some of the MOU signatories.
- At some point, the scope was expanded to include lower voltage transmission lines.
 - Smaller transmission owners (mainly public power) were concerned they would be covering the costs of large transmission expansion (mainly investor-owned utilities) and that they would lose control over decisions regarding the use of and investments in these assets.
 - The scope change to include lower voltage transmission lines appears to have driven away some of the smaller members, beginning with Montana Power.
- BPA drafted a legal opinion that determined Federal legislation would be required for BPA to sell, lease or transfer operating control of BPA’s transmission system to another entity.

Outcome

- Because of the challenges, MOU signatories began to withdraw from the process, and the initiative eventually ended.

Key Take-Aways

- Federal policy rather than regionally determined benefits as the driver of IndeGO made it too difficult to overcome the challenges.

b. 2000 – 2006: RTO West/Grid West

Scope

The scope of RTO West was to create a Regional Transmission Organization (RTO) for the Pacific Northwest that would:

- Implement a common market framework consistent with the Standard Market Design discussed in FERC’s Notice of Proposed Rulemaking.
- Consolidate and operate a single Balancing Authority Area.
- Create a single Transmission Provider that would provide access to all facilities under its control through a tariff filed with FERC.
- Creation of an independent for-profit transmission company (TransConnect) that would own and operate interstate transmission facilities and participate in RTO West as a single transmission owner.

The scope of Grid West removed the common market framework and narrowed the scope of other elements from RTO West.

Participants

Northwestern	PacifiCorp
BPA	Portland General Electric
Idaho Power	Puget
Avista	BC Hydro
Nevada Power	Sierra Pacific

TransConnect:

Northwestern	
Avista	Puget Sound Energy
Nevada Power	Sierra Pacific
Portland General Electric	

Drivers

- FERC Order 2000 encouraged utilities and transmission owners to join RTOs to create an organized competitive marketplace
- FERC Standard Market Design NOPR proposed single transmission tariffs and energy markets that used locational marginal pricing (LMP).
- DOE directed Power Marketing Authorities to participate in RTO development.

Process

- The RTO West Regional Representatives Group was formed in 2000 and charged with reviewing and discussing issues and recommending approaches to the successful formation of an RTO in the Northwest. This group was composed of representatives of interest groups in the region, including BPA, other utilities, and regulators.
- RTO West "Stage 1" proposals submitted to FERC in Oct 2000 which included a proposed RTO West structure and stakeholder principles as well as the creation of TransConnect.
- In March 2001, DOE Secretary Abraham called on FERC to take immediate affirmative action on the RTO West proposal in a manner acceptable to the Northwest.
- FERC conditionally approved portions of the "Stage 1" filing in April 2001 and agreed to allow the formation of TransConnect. FERC also stated that RTO West can serve as the anchor for the ultimate formation of a west-wide RTO.
- RTO West "Stage 2" filing was submitted to FERC in In April 2002 which included specific proposals on governance, "license plate" pricing, congestion management, transmission planning/expansion, seams resolution, and market monitoring.
 - "Stage 2" filing indicated that regional mechanisms for Resource Adequacy already existed in the region and that FERC's Standard Market Design should "recognize the primacy of these mechanisms."
- FERC approved nearly all elements of the "Stage 2" filing in October 2002 but deferred on elements related to the market design until the final stage of their Standard Market Design rulemaking.
- Northwest Power Works formed a coalition of public power entities in 2002 to oppose RTO West and the FERC Standard Market Design NOPR
 - After the 2001 power crisis, there were concerns about creating a California-style market in the Northwest.
 - Projected costs between \$125 and \$140 million per year were thought to be too high, even though independent analysts projected of \$300 million of annual savings.

- In 2003, FERC acknowledged the uniqueness of the Northwest and the concerns expressed by Northwest stakeholders and committed to work with interested parties to find solutions that are appropriate to the unique needs of the Pacific Northwest.
- Some of BPA's legal concerns were addressed by the having the market operator provide instructions to BPA operators and the BPA operators would retain ultimate control of the federal system.
- RTO West was rebranded Grid West in 2004, which removed the common market framework from the scope.
- In July 2005, FERC conceptually approved Grid West's request for a declaratory order that the proposed entity would satisfy FERC Order 2000 requirements but would not necessarily have to qualify as an RTO.
- Following FERC's conceptual approval, a number of public power agencies and municipal utilities formed a group called the Transmission Issues Group and put forth their own counterproposal, which stopped short of placing grid operations in the hands of an independent entity.
- In November 2005, BPA proposed a compromise plan to reconcile Grid West and the Transmission Issues Group, which failed to gain support. As a result, Puget and Avista left Grid West and the remainder of Grid West participants rewrote the bylaws and removed all provisions that referenced BPA.
- BPA, Puget, Seattle, Chelan, and Grant proposed creating a new organization that would build upon the TIG proposal that would complement, but not compete with Grid West.
- In April 2006, the remaining Grid West members voted to dissolve for lack of financial support

Challenges

- Public power was concerned about BPA and FERC jurisdiction and potential impacts to local control.
- As projected by the RTO West proposal and demonstrated by other RTOs around the country, the initial and ongoing costs appeared to be very high.
- General disagreement on the need for organized electricity markets between public power and investor-owned utilities.
- BPA needed assurance that centralized dispatch would not interfere with high-priority non-power obligations (flood risk management, mitigation for endangered species, etc.).
- While a governance structure was approved in the "Stage 2" filing to FERC, BPA wanted veto power, which was viewed as a "poison pill" to some participants.
- Regulated utilities were concerned with the possibility that they would be pushed in opposite directions by state and federal regulators

Outcome

- During Grid West, ACE Diversity Interchange (ADI) was identified as a reliability tool which allow balancing areas to pool Area Control Errors (ACE) to take advantage of control error diversity. This was eventually implemented in 2007.
- Throughout the RTO West and Grid West processes, there was consistent agreement that regionally coordinated transmission planning is necessary to ensure the long-term reliability of the Northwest grid.
 - Building from the TIG, Columbia Grid was founded in 2006 with BPA, Avista, Chelan, Grant, Puget and Seattle as participants to develop a one-utility approach to planning.
 - Northern Tier was created as a similar organization to Columbia Grid but comprised of IOUs.
 - Columbia Grid and Northern Tier merged in 2020 to create Northern Grid.

Key Take-Aways

- Lack of alignment between public power and national energy policy encouraging the creation of organized markets
- Portions of the initiative where there were regional benefits were pursued (ADI, Columbia Grid, Northern Tier)
- Ability of BPA to participate may be an obstacle to regional market/operational evolution.

c. 2012 – 2016: Northwest Power Pool Members Market Assessment and Coordination (MC) Initiative

Scope

- The goal of the NWPP MC Initiative was to establish a centralized Market Operator to perform within hour optimization and dispatch using a 5-minute security constrained economic dispatch model.
- The effort transitioned in the final year to development of an automated, centrally cleared 15-minute market, also known as the centrally cleared energy dispatch market (CCED) paired with a regulation reserve sharing group and other regional tools.

Participants

- | | |
|--|-------------------------------------|
| • NWPP | • Chelan PUD |
| • Avista | • PacifiCorp |
| • Balancing Area of Northern California (BANC) | • Portland General Electric (PGE) |
| • BPA | • Clark County PUD |
| • BC Hydro/Powerex | • Portland General Electric |
| • Eugene Water & Electric Board (EWEB) | • Grant County PUD |
| • Idaho Power | • Snohomish PUD |
| • NaturEner | • Seattle City Light |
| • NorthWestern Energy | • Tacoma Power |
| • Puget Sound Energy (PSE) | • Turlock Irrigation District (TID) |
| | • WAPA/Upper Great Plains |

Drivers

- By 2011, 6,000 MW of wind was expected to be added in the Northwest creating interest in a solution to integrate this wind and other new renewable resources.
- The addition of the new renewable resources also highlighted the limited transmission in the region and interest in market and non-market solutions to bring enhanced efficiency and reliability to the NW power system.
- The NWPP contingency reserve program had been successful for decades and there was an interest to build off this success and consider other tools to leverage diversity among utilities in the region.
- Energy Policy Act of 2005 included a requirement for the DOE to study the procedures used by electric utilities to perform economic dispatch; identify revisions to enable non-utility generation resources to offer their output for economic dispatch; study benefits to customers if dispatch was improved to enable more non-utility generation participation.

- The report concluded that there is room to improve economic dispatch practices to reduce the total cost of electricity and increase grid reliability. It did not attempt, however, to estimate the magnitude of such potential improvements.
- A series of studies, largely requested or encouraged by Western state electricity regulators and other state officials, focused on the potential impact of an EIM.
 - In 2011, the Western Electricity Coordinating Council (WECC) evaluated a proposed EIM in partnership with Energy and Environmental Economics (E3). The [study](#) was based on the Transmission Expansion Planning and Policy Committee Planning Case 0, which included annual energy penetrations of 8% wind and 3% solar in the year 2020.
 - In early 2012, a group of public utility commissioners in the West expressed interest in additional analyses of the potential operational benefits of an EIM and the PUC EIM Task Force was formed and facilitated by the Western Interstate Energy Board and asked NREL to perform a [study](#) of the benefits of an EIM.
 - FERC staff conducted a [study](#) in 2013 concluding an EIM could provide reliability benefits through improved visibility and situational awareness, better management of transmission flows and system operating limits and faster more diverse operational options to respond to imbalances.
 - March 2013, the CAISO released a [study](#) of PacifiCorp-ISO EIM benefits conducted by E3, identifying interregional and intraregional dispatch savings, reduced flexibility reserves and reduced renewable energy curtailment as the benefits of the EIM.

Process

- March 2012: The NWPP MC initiative kicks off, beginning with conversations on market and non-market solutions to bring enhanced efficiency and reliability to the Northwest Power System.
- February 2013: PacifiCorp and CAISO announce plans to jointly develop an EIM
- September 2013: NREL Study on potential benefits of an EIM in the WECC
- 2014: MC Participants finalize design and issue RFP for Market Operator
- February 2015: Responses to RFP show high cost to build a market as designed
- March 2015: PSE announces it will participate in EIM
- Spring 2015: Concept of CCED market was proposed
- Sept 2015: Petition for Declaratory Order on jurisdiction filed with FERC
- September 2015-October 2015: PGE, BANC and Idaho Power announces they were pursuing the Western EIM with CAISO and withdrew from MC initiative
- January 2016: Petition for declaratory order withdrawn
- January 2016: MC initiative effort concludes

Challenges

- PacifiCorp, who was one of the key participants at the outset decided to join the EIM and others also eventually left for EIM while the MC initiative was still underway.
- The cost to build a new system and novel market design was too expensive relative to expectations and other existing market design options.
- The market concept evolved from a 5-minute security constrained economic dispatch model (similar to Western EIM) to a 15-minute centrally cleared market (no security-constrained economic dispatch) in part due to the time and costs associated with the original concept which was seen as both time and cost-prohibitive.
- The participants were unable to solve key transmission issues:
 - Concern about use of BPA's transmission system and cost allocation to BPA's customers

- Pancaked transmission costs for those not directly connected to BPA’s system
- The decision-making structure used for the effort required consensus on all issues amongst all parties which made progress difficult.
- There was a perception that not all entities participating in the effort were committed to its success and had different long-term goals.

Outcome

- A within-hour market was never implemented and the petition for declaratory order at FERC was withdrawn.
- Many of the MC initiative participants ended up joining the EIM. (PacifiCorp, PSE, Idaho Power, Seattle City Light, BPA, Tacoma Power, BANC, Powerex, PGE).
- A regional flow forecast tool that looked at actual transmission flows for all flow gates in the NW with the intent to identify the level of risk that transmission might be exposed to was implemented at Peak RC and functional for several years but was ultimately turned off because entities were both not using it and did not want to continue funding it.
- A regional monitoring and delivery tool that was intended to be a bulletin board for which entities were short and which were long so that they could reach out to one another was nearly operational, but never implemented. This was intended to replace the e-mail process used by the WECC Merchant Alert and is conceptually similar to what the NWPP RA program is currently using for interim resource adequacy program.

Key Take-Aways

- The cost to build a new market design and system is challenging to justify if the costs of joining an existing market are lower.
- Use of BPA’s transmission system and associated cost allocation issues are challenging.
- Concerns with pancaked transmission for those not directly connected to BPA’s system were not ultimately solved.
- The consensus-based approach used for this effort was perceived to allow individual entities to stall progress.

d. 2014 – Present: Western Energy Imbalance Market

Scope

- The Western EIM is a voluntary market for utilities across the Western Interconnect that allows participants to optimize generation dispatch close to the time the electricity is consumed, trading power every 5 minutes, and gives system operators real-time visibility across neighboring grids.
- The result improves balancing supply and demand at a lower cost.

Participants

- | | |
|--|---|
| <ul style="list-style-type: none"> ● PacifiCorp (2014) ● NV Energy (2015) ● Puget Sound (2016) ● Arizona Public Service (2016) ● Portland General Electric (2017) ● Idaho Power Company (2018) ● Powerex (2018) | <ul style="list-style-type: none"> ● Balancing Authority of Northern California (2019) ● Salt River Project (2020) ● Seattle City Light (2020) ● Los Angeles Department of Water & Power (2021) |
|--|---|

- Public Service Company of New Mexico (2021)
- NorthWestern Energy (2021)
- Turlock Irrigation District (2021)
- Pending
- Avista (2022)
- Tucson Electric Power (2022)
- Tacoma Power (2022)
- BPA (2022)
- Xcel Energy – Colorado (2022?)
- Avangrid (2023)
- WAPA DSW (2023)
- El Paso Electric (2023)

Drivers

- Same drivers as noted in the Northwest Power Pool MC Initiative

Process

- PacifiCorp became interested in the concept in 2010 or 2011.
- This effort was simultaneous to NWPP MC Initiative effort.
- CAISO and PacifiCorp sign a memorandum of understanding in February 2013 to pursue an EIM.
- FERC accepts an implementation agreement between CAISO and PacifiCorp on June 28, 2013.
- CAISO submits an EIM proposal to FERC on February 28, 2014 which FERC conditionally accepts on June 19, 2014.
- November 2019: Western EIM goes live with PacifiCorp
- Between late 2014 and June 2015 CAISO conducts an initiative to establish the governance structure for EIM.
- The Western EIM footprint currently includes portions of Arizona, California, Idaho, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming, and extends to the border with Canada.

Challenges

- Governance structure that retains final decision-making authority with the ISO Board of Governors, who are appointed by the California governor, impacts non-California participants confidence in governance and wiliness to expand the market construct.

Outcome

- By 2023, 23 active Western EIM participants will represent over 83% of the load within the Western Electricity Coordinating Council (WECC).

Key Take-Aways

- The sunk costs of CAISO's existing platform and processes made the EIM concept cheaper for PacifiCorp, as the first participant.
- The market was developed with a single market participant and build momentum by the rapid addition of key members.
- The decision to join, exit, and participate is voluntary, which has alleviated certain governance concerns that otherwise may have challenged its success
- Parties were able to act individually, without the need to achieve consensus with multiple stakeholders
- Incremental steps initiated by willing entities proved successful.

e. 2015 – 2018: PacifiCorp as a Participating Transmission Operator (PTO) in CAISO

Scope

- In response to an MOU between CAISO and PacifiCorp, California SB 350 was passed which required CA state agencies to examine the feasibility of a regional electric grid and the transformation of CAISO to a regional grid operator.
- Once SB 350 passed, PacifiCorp began a formal process to explore joining the CAISO as a full participating transmission owner.
- It was envisioned that CAISO would assume operational control over the transmission facilities of PacifiCorp and PacifiCorp would get access to the full services of the ISO, including a day-ahead regional energy market.
- The expanded regional grid would require:
 - A new governance structure to accommodate PTO's joining outside California.
 - Transmission control agreements executed by PTOs.
 - A new transmission planning process and changes to the CAISO's transmission access charge methodology and the ISO tariff for resource adequacy.

Participants

- PacifiCorp
- CAISO
- California Energy Commission, California Air Resources Board, California Public Utilities Commission
- California legislature

Drivers

- PacifiCorp's interest to join CAISO as a PTO is described as a result of its commitment to reducing its coal fleet and expanding its portfolio of renewable resources. Joining the ISO as a full participant would allow PacifiCorp to invest even more heavily in renewable energy since the ISO's advanced dispatch increases the efficiency and cost-competitiveness of renewables.
- The CAISO's interest in PacifiCorp as a PTO is described as follows: the ISO has determined there is an opportunity to secure benefits to ISO market participants through enhanced coordination of resources in the ISO's day-ahead and real-time markets and through the efficient use and continued reliable operation of an expanded system of transmission facilities operated by the ISO.
- A larger footprint was viewed as enhancing CA's ability to implement its renewable energy policies by bringing more resources to the mix, reducing overbuilding, improving renewable integration and reducing the cost of energy in the West.

Process

- April, 2015: New Participating Transmission Owner MOU between PacifiCorp and CAISO was signed with target transition date of 2017.
- September, 2015: SB 350 passed.
- 2016: the CEC, Office of the Governor, CARB CPUC and other stakeholders held a series of public meetings to examine the evolution of CAISO into a regional grid operator. The last public stakeholder meeting was held in October 2016.
- July, 2016: SB 350 final study results were released.

- July, 2016: SB 350 final governance proposal was presented at joint state agency workshop.
- August, 2016: Evaluation of Jurisdictional and Constitutional Issues Arising from CAISO expansion to Include PacifiCorp assets.
- August, 2016: Governor Brown announced his support for a regional grid operator.
- September 2016: final study results were submitted to the governor's office.
- 2018: legislation required to move regionalization forward fails to materialize.

Challenges

- The SB 350 process was met with many concerns by California stakeholders.
 - California environmental and consumer advocates pointed to study results released by the CAISO that they argued demonstrated that PacifiCorp joining as a PTO alone would increase coal dispatch and lead to higher GHG emissions.
 - There were questions and concerns about whether adding PacifiCorp as a PTO would alter FERC's jurisdiction over CAISO, including FERC's ability to displace California's authority over environmental matters or its ability to affect state policies regarding building of generation facilities and the types of resources LSEs should procure.
 - There were concerns about California having to pay for new transmission facilities built as a result of regionalization and the costs associated with these.
- Without changes to the ISO Board and governance structure, non-California utilities indicated that they would have no interest in entering a Transmission Control agreement with the CAISO.
- There was also a lack of trust between California and other Western States resulting from the 2001 power crisis and concerns that regionalization could increase California's risk of having another electricity crisis.
- As the process continued and the costs to be a full Participating Transmission Owner were better defined, the costs were an additional a hurdle.

Outcome

- The CA state legislation that was required to move regionalization and anticipated to occur in 2018 did not materialize and this effort closed.
 - The primary reason that the legislation failed was because many parties in California did not believe there were benefits to California. The California chapters of the Sierra Club, in particular, were very concerned that there would be increased emissions into the State because of PacifiCorp's heavy coal fleet.
 - The Utility Reform Network (TURN), Sierra Club and California Municipal Utility Association (CMUA) were opposed to legislation to support a governance change.
 - PacifiCorp was simultaneously losing their interest to join CAISO as a PTO because they had realized that the costs were large.
- Progress was made in key areas:
 - The studies that were conducted as part of SB350 provided a comprehensive picture of the benefits of a regional grid operator in the West which is a necessary foundation for regionalization in the future.
 - The principles for regional ISO governance, while not supported by all stakeholders, provide an understanding of the key issues and concerns of stakeholders with respect to governance of a regional grid operator for future efforts.
 - Legal analysis conducted concluded that inclusion of PacifiCorp's assets in the CAISO would not alter FERC's jurisdiction, displace any existing state authority over environmental matters or alter the constitutionality of California's existing environmental and clean energy laws.

Key Take-Aways

- The California legislature is challenged to make changes to the current governance framework because of constituent concerns about impacts to within state jobs and clean energy goals.
- Studies generally show benefits to regional markets, with RTO benefits being the greatest, but demonstrating benefits alone won't clear the hurdles for regional expansion.
- There are differences among the state regulators with respect to thoughts on states' role in governance and how to approach resource adequacy.

f. 2013 – 2018: Mountain West Transmission Group

Scope

Initiated with a goal of exploring a common transmission tariff or participation in an RTO.

Participants

- Basin Electric Power Cooperative (BEPC)
- Black Hills Energy:
 - Black Hills Power (BHP)
 - Black Hills Colorado Electric Utility Company (BHCE)
 - Cheyenne Light Fuel & Power Company (CLFP)
- Colorado Springs Utilities (CSU)
- Platte River Power Authority (PRPA)
- Public Service of Colorado (PSCo)
- Tri-State Generation and Transmission Association (Tri-State)
- Western Area Power Administration (WAPA)
 - Loveland Area Projects (LAP)
 - Colorado River Storage Project (CRSP)

Additional Contributors: SPP and Brattle were key technical advisors throughout.

Drivers

- Xcel Energy subsidiaries had found benefits in other markets. Public Service of Colorado (an Xcel company) initiated discussions with utilities. Similarly, WAPA Upper Great Plains had recently joined the SPP RTO and had found benefits.

Process

- 2013: MWTG was formed to evaluate an array of options ranging from a common transmission tariff to an RTO
- 2014 – 2015: A common transmission tariff methodology was developed and refined.
- 2015: Public Service of Colorado, Black Hills, Colorado Springs and Platte River Power Authority file a joint dispatch agreement with FERC. Agreement was approved February 2016.
- 2016: Studies were conducted that evaluated production cost benefits of common transmission tariff and SPP RTO membership
- 2017: MWTG decided to pursue membership in SPP's RTO
- 2018: Public Service Company of Colorado withdrew; Later in the year Black Hills Energy withdrew
- October 30, 2018: MWTG activity ended

- June 2019: SPP developed and shared a proposal for Western Energy Imbalance Services (WEIS)
- September 2019: Basin Electric, Tri-State, and WAPA announce their decision to join SPP WEIS
- December, 2019: After a Brattle study exploring options, PSCo, Black Hills, Colorado Springs and Platte River Power Authority agree to join the Western EIM
 - The Brattle study found that CAISO’s Western EIM is the larger of the two markets and offers greater potential to lower production costs due to the size of its market footprint and the diverse resources available
- November, 2020: Western EIS members indicate they will consider expansion to join SPP RTO
- February 2021, Basin Electric, Deseret Power, Municipal Energy Agency of Nebraska, Tri-State, Wyoming Municipal Power Agency and WAPA launch WEIS
- Colorado Springs Utilities has announced its intent to join the WEIS

Challenges

- Xcel Energy, which was the largest member of the group, announced it would end its participation. High level risks identified were:
 - Upward pressure on project costs at SPP
 - Declining potential for expansion as EIM expands
 - SPP east members pushing back on terms of agreement
 - Uncertain regulatory support
- PSCo was on record, at the same time, expressing concerns about the risks associated with RTO participation. Specifically recent FERC decisions that Distributed Energy Resources and storage resources connected at the distribution level would be allowed to be market participants. PSCo had argued that these should be state-level decisions.

Outcome

- A joint transmission tariff was never implemented.
- In 2015, a subset of utilities created and implemented a joint dispatch agreement. These same entities have indicated their intention to join the Western EIM.
- In 2019, subset of entities formed and launched the Western Energy Imbalance Service which become operational in February 2021. The same entities are exploring full participation in the SPP RTO.

Key Take-Aways

- Transmission and resource diversity matter for generation optimization benefit.
- Large Balancing Authority Areas can be key to the financial value of an effort.
- The region entities made progress but did not complete a common transmission tariff.
- Support of State Commissions are needed for investor-owned utilities.

VIII. Appendix C: Influential Regulation

a. FERC Orders 888 and 889

- Final rules issued April 24, 1996
 - [FERC Order 888](#)
 - [FERC Order 889](#)

Drivers

- Vertically integrated utilities—utilities who own generation, transmission, and distribution and the owners of most of the transmission lines in the U.S.—were perceived to be stifling independent power producers by not providing access to transmission and letting excess grid capacity go unused.
- There was a general push toward deregulation in other markets with monopolies such as the airline, trucking, and railroad industries. The validity of the “natural monopoly and regulation structure,” was brought into question by the rise of the free market in these similarly situated industries.
- Passage of the Public Utility Regulatory Policies Act (PURPA) in the 1970s required electric utilities to buy electricity generated from non-utility small power producers at rates equivalent to the utility’s own generation or procurement costs. As these independent power producers came online, the inadequacies of the transmission system across the U.S. were revealed.
- FERC’s goal (as outlined in rule): “The Commission’s goal is to remove impediments to competition in the wholesale bulk power marketplace and to bring more efficient, lower cost power to the Nation’s electricity consumers.”
- FERC deemed competition a better restraint on unchecked assets or profits than a regulatory structure.

Scope

- Order 888 requires all public utilities that own, control or operate transmission facilities in interstate commerce to establish a non-discriminatory process for providing open access to their transmission facilities.
- FERC recognized the difficulty in ensuring non-discriminatory open access to the transmission system when single companies often owned both electricity generation and transmission facilities, and it saw ISOs and eventually RTOs as a way of interposing an independent grid manager that could avoid such conflicts and satisfy the requirements of providing non-discriminatory access to transmission.
- Therefore, the Order encouraged the creation of Independent System Operators and Regional Transmission Organizations.
- Order 889 laid out the structure and function of what became known as OASIS “nodes,” which are secure, web-based interfaces to each transmission system’s market offerings and transmission availability announcements.

Outcome

- Existing power pools moved toward using ISOs or RTOs to satisfy the requirement of an open-access transmission service. The following timeframe is when ISOs or RTOs were formed:

- PJM fully functioning ISO in 1996, designated as an RTO in 2001
- ERCOT functioning as an ISO since 1996
- ISO New England founded 1998
- NYISO authorized by FERC 1998, launched in 1999
- CAISO founded 1998, fully functioning ISO in 2008
- MISO formed 2001, began market operations April 2005
- Southwest Power Pool RTO achieved RTO status in 2004
- Non-ISO/RTO regions, like the Pacific Northwest, responded to Orders 888 and 889 by amending their own state statutes to require utilities to functionally unbundle their generation, transmission, and distribution functions. Affiliated power marketers could no longer work alongside the transmission operators who were charged with treating them and external parties equally, and at the same time affiliated power marketers would no longer have any "inside information" on the availability of the transmission system nor the transactions being scheduled on it.

b. FERC Order 2000

- Final rule issued December 20, 1999
 - [FERC Order 2000](#)

Drivers

- Since establishing Order 888 in 1996, the utility industry underwent sweeping restructuring activity, many states moved to develop retail competition, many generation plans were divested by electric utilities, there was a significant increase in the number of mergers among traditional electric utilities, large increases in the number of power marketers and independent generation facility developers entering the marketplace, and the establishment of ISOs as managers of large parts of the transmission system. Trade in bulk power markets continued to increase significantly and the Nation's transmission grid was being used more heavily and in new ways.
- There was a perception that vertically integrated electric utilities were inadequate to support the efficient and reliable operation that is needed for the continued development of competitive electricity markets.
- The view was that if competition was impeded, prices may increase and detract from reliability.
- Comments from a FERC Notice of Proposed Rulemaking supported the conclusion that independent regionally operated transmission grids will enhance the benefits of competitive electricity markets.
- FERC's perspective was that competition in wholesale electricity markets is the best way to protect the public interest and ensure that electricity consumers pay the lowest price possible for reliable service.

Scope

- Order 2000 amends FERC's regulations under the Federal Power Act (FPA) to advance the formation of Regional Transmission Organizations (RTOs).
- The regulations require that each public utility that owns, operates, or controls facilities for the transmission of electric energy in interstate commerce make certain filings with respect to forming and participating in an RTO.

- The Commission also codifies minimum characteristics and functions that a transmission entity must satisfy in order to be considered an RTO.
- The Commission's stated goal was to promote efficiency in wholesale electricity markets and to ensure that electricity consumers pay the lowest price possible for reliable service.

Outcome

The Order outlined four minimum characteristics for RTOs. These characteristics were intended to ensure non-discriminatory access by all market participants to the transmission grid, while maximizing the efficiency of operations by eliminating multiple actors.

- Independence from market participants;
- Appropriate scope and regional configuration;
- Possession of operational authority for all transmission facilities under RTO control; and
- Exclusive authority to maintain short-term reliability of the grid.

Seven major RTO functions were laid out in FERC Order 2000:

- Tariff administration and design;
- Congestion management;
- Management of parallel path flows;
- Provision of last resort for ancillary services;
- Development of an open access same-time information system (OASIS);
- Market monitoring; and
- Responsibility for planning and expanding facilities under its control.

The Order established transmission ratemaking policy for RTOs, including as follows:

- Pancaked Rates
- Reciprocal Waiving of Access Charges Between RTOs
- Uniform Access Charges
- Congestion Pricing
- Service to Transmission-Owning Utilities That Do Not Participate in an RTO
- Performance-Based Rate Regulation
- Other RTO Transmission Ratemaking Reforms
- Additional Ratemaking Issues
- Filing Procedures for Innovative Rate Proposals

The Order addresses other issues, as follows:

- Public Power and Cooperative Participation in RTOs
- Participation by Canadian and Mexican Entities
- Existing Transmission Contracts
- Power Exchanges
- Effect on Retail Markets and Retail Access
- Effect on States with Low-Cost Generation
- States' Roles with Regard to RTOs
- Accounting Issues
- Market Design Lessons

c. FERC NOPR Standard Market Design (SMD)

- July 31, 2002 FERC issued Notice of Proposed Rulemaking
- July 19, 2005 FERC issued order terminating proceeding

Drivers

- 2001 power crisis; FERC tried to find the rules that would ensure competition, non-discrimination, and transparency in wholesale electric markets throughout the country so that a crisis like that in 2001 could not recur in the Western Interconnect.
- Commissioner Wood described goals as:
 - promote economic efficiency in electricity for the benefit of all Americans;
 - let sellers transact easily across geographic boundaries, cut costs to customers, and improve reliability;
 - solid infrastructure, just and reasonable rates, and balanced market rules to investors and competitors have stability and opportunity in all aspects of the bulk power business.
 - Clear rules and vigilant oversight under a uniform system

Scope

- Adoption of a single transmission tariff that would be applied to all transmission customers—wholesale, unbundled retail, and bundled retail.
- Transfer of control over all utility transmission systems to an Independent Transmission Provider.
- Establishment of locational marginal pricing (LMP) energy markets and tradable financial rights (congestion revenue rights, or CRRs) as a means to fix the costs of transmission service.
- Development of procedures for ensuring long-term resource adequacy.
- New choices through a flexible transmission service and an open and transparent spot market design that would provide the right pricing signals for investment in transmission and generation facilities.
- Backstops to protect customers against the exercise of market power when structures do not support a competitive market, i.e., market monitoring and market power mitigation.

Outcome

- There was significant and widespread opposition to the NOPR, especially in areas where RTOs had not taken off -- including in the Northwest. The Northwest concerns were that FERC was encroaching into traditional areas of state regulation; FERC was applying a “one-market-fits-all” approach on the grounds that locational marginal pricing does not send the right price signals with respect to the dispatch of hydro; SMD was not appropriate because BPA is not directly subject to portions of the Federal Power Act that form the basis for the SMD proposal.
- As a result of opposition to the SMD, FERC withdrew its proposed rule, indicating:
 - Since issuance of the SMD NOPR, the electric industry had made significant progress in the development of voluntary RTOs/ISOs (*e.g.*, Midwest Independent Transmission System Operator, Inc. and Southwest Power Pool, Inc.). This has allowed interested parties, through region-specific proceedings, to shape the development of independent entities to reflect the needs of each particular region.

- The Commission instead indicated that it intends to consider revisions to the Order No. 888 pro forma Open Access Transmission Tariff to reflect the experience of the electric utility industry and the Commission with open access transmission over the last decade.
- Therefore, given the continuing development of voluntary RTOs and ISOs and the Commission’s expressed intent to look into revisions to the Order No. 888 pro forma tariff in a separate proceeding, the Commission concluded that the SMD NOPR has been “overtaken by events.”

d. BPA Considerations for Market Participation

In the Record of Decision (ROD) issued in September 2019 that documented BPA’s legal authority to join the Western EIM, BPA assessed the following issues:

- General authority to operate in a business-like manner and to join the EIM
- Obligations with respect to preference to power and surplus power requirements
- Obligation to make sales from the Federal System and bidding power into the EIM from specific projects or groups of projects
- Statutory authority to provide transmission service
- Consistency with contractual commitments: Power Contracts and Transmission Contracts
- Federal Energy Regulatory Commission jurisdiction with respect to BPA as an EIM entity
- Market oversight under the CAISO Tariff
- Governance

While BPA found that none of these issues created a barrier to participate in the Western EIM, it is not clear whether further market expansion of a day-ahead market or an RTO would create barriers for BPA participation.

References*

**This report was developed through research as well as interview conversations with individuals that were directly involved in the regional efforts analyzed. We have made every effort to provide a factually accurate account of these efforts, however, it is possible that not all details have been captured. We welcome any additions or corrections.*

- Portion of country in ISOs/RTOs: Energy Information Association (2011) <https://www.eia.gov/todayinenergy/detail.php?id=790>
- NERC Reliability Functional Model Version 6 (2016) [Report \(nerc.com\)](#)
- Mountain West Transmission Group (last updated 2018) [Mountain West Transmission Group Initiative** \(wapa.gov\)](#)
- National Renewable Laboratory 2013 Study (2012). <https://old.energyexemplar.com/wp-content/uploads/publications/NREL%20presentation.pdf>
- The policy and institutional challenges of grid integration of renewable energy in the western United States (2015) [Angela Cifor Renewable energy 2015.pdf \(sciencedirectassets.com\)](#)
- Slide deck used for the January 1998 Pacific Northwest and Northern Rockies Independent Grid Operator (IndeGO) Public Comment Meetings (*uploaded to the Market Retrospective Google Drive folder*)
- Assorted PNUCC papers compiled into a PDF entitled “Progress Report on NW Transmission Restructuring 1996” (*uploaded to the Market Retrospective Google Drive folder*)
- The following news reports:
 - <https://www.ogj.com/pipelines-transportation/pipelines/article/17263415/ferc-approves-rto-west-after-us-energy-secretary-calls-for-action>
 - <https://lasvegassun.com/news/2000/oct/17/six-electric-utilities-want-to-merge-high-voltage/>
 - https://nationalwind.org/wp-content/uploads/2013/05/TM_Update_2002-10.pdf
 - <https://www.energylegalblog.com/blog/2005/11/15/pacific-northwest-grid-restructuring-proposal-fails-utilities-vow-continue-without>
 - <https://www.energylegalblog.com/blog/2006/01/23/grid-west-parties-bpa-go-separate-ways>
 - <https://www.energylegalblog.com/blog/2006/04/16/columbiagrid-supplants-gridwest-pacific-northwest>
- The following material from Public Power entities
 - <http://www.seattle.gov/light/publications/lightreport/docs/Sept02.PDF>
 - <https://douglaspud.org/pages/julyaugust-2002-here%27s-your-chance-to-say-no%21-to-energy-price-manipulation-what-is-being-proposed.aspx>
 - <https://law.justia.com/cases/federal/appellate-courts/F3/272/607/559481/>

- BPA’s Record of Decision on Columbia Grid:
[https://www.bpa.gov/news/pubs/PastRecordsofDecision/2007/Final PE ROD 3 5 07.pdf](https://www.bpa.gov/news/pubs/PastRecordsofDecision/2007/Final_PE_ROD_3_5_07.pdf)
- CREPC Transmission Planning and Expansion Work Group: <https://www.raonline.org/wp-content/uploads/2016/05/rap-anderson-transmissionplanninginwest-2004-01-29.pdf>
- Timeline of Regional Energy Market/SB 350: <http://www.caiso.com/Documents/RegionalEnergyMarket-FastFacts.pdf>
- Drivers of SB 350/Regionalization
 - https://www.leg.state.nv.us/App/NELIS/REL/79th2017/ExhibitDocument/OpenExhibitDocument?exhibitId=26042&fileDownloadName=0213a_JohBo.pdf
 - <http://www.caiso.com/Documents/SB350Study-OverviewImpacts-RegionalEnergyMarket-FastFacts.pdf>
 - <http://www.caiso.com/Documents/RegionalEnergyMarket-FastFacts.pdf>
- CAISO’s Interest in PacifiCorp as a PTO
<http://www.caiso.com/Documents/LegalEvaluationOfISOExpansion.pdf>
- SB 350 studies environmental and economic impacts of a Regional Grid:
 - <http://www.caiso.com/Documents/SB350Study-OverviewImpacts-RegionalEnergyMarket-FastFacts.pdf>
 - <http://www.caiso.com/Documents/RegionalEnergyMarket-FastFacts.pdf>
- Legal Evaluation of ISO Expansion:
<http://www.caiso.com/Documents/LegalEvaluationOfISOExpansion.pdf>
- Challenges of SB 350 Regionalization
 - https://www.leg.state.nv.us/App/NELIS/REL/79th2017/ExhibitDocument/OpenExhibitDocument?exhibitId=26042&fileDownloadName=0213a_JohBo.pdf
 - <https://content.sierraclub.org/press-releases/2016/05/new-study-shows-proposed-california-pacificorp-energy-market-integration>
- Principles on Regional ISO Governance:
https://www.leg.state.nv.us/App/NELIS/REL/79th2017/ExhibitDocument/OpenExhibitDocument?exhibitId=26042&fileDownloadName=0213a_JohBo.pdf
- FERC Order 2000:
 - https://www.ferc.gov/sites/default/files/2020-06/RM99-2-00K_1.pdf
 - <https://www.power-grid.com/smart-grid/ferc-order-2000-drives-rto-initiatives-isos-transcos-prevail/#gref>
- FERC Order 888: <https://www.ferc.gov/industries-data/electric/industry-activities/open-access-transmission-tariff-oatt-reform/history-oatt-reform/order-no-888>

- Background on FERC Order 888, 889, and 2000: <https://transmissives.com/the-story-of-the-grid/restructuring-the-effects-of-ferc-orders-888-889-and-2000/>
 - FERC Order 888: <https://www.ferc.gov/industries-data/electric/industry-activities/open-access-transmission-tariff-oatt-reform/history-oatt-reform/order-no-888>
 - FERC Standard Market Design efforts:
 - <https://corporate.findlaw.com/litigation-disputes/detailed-summary-of-ferc-s-standard-market-design-nopr.html>
 - <https://cms.ferc.gov/sites/default/files/2020-05/20050719123006-RM01-12-000.pdf>
 - EIM: <https://www.westerneim.com/Pages/documentsbygroup.aspx?GroupID=47FF0BF2-065E-4770-A4C6-04EF74CED31F>
 - Western Electricity Coordinating Council (WECC) evaluation of proposed EIM in partnership with Energy and Environmental Economics (E3): <https://www.ethree.com/projects/assessing-benefits-challenges-western-eim/>
 - PUC EIM Group/ Western Interstate Energy Board - NREL study of EIM benefits: <https://www.nrel.gov/docs/fy13osti/57115.pdf>
 - FERC staff paper on EIM: <http://www.caiso.com/Documents/QualitativeAssessment-PotentialReliabilityBenefits-WesternEnergyImbalanceMarket.pdf>
 - CAISO study on EIM: <https://www.westerneim.com/Documents/PacifiCorp-ISOEnergyImbalanceMarketBenefits.pdf>
 - Western Flexibility Assessment: <12-10-19-ES-WIEB-Western-Flexibility-Assessment-Final-Report.pdf> (westernenergyboard.org)
-