THE STATE-LED MARKET STUDY

ROADMAP *Market and Regulatory Review Report*

Prepared by:

Energy Strategies, Project Contractor

July 30, 2021

About the Study and Roadmap

The U.S. Department of Energy awarded the State Energy Offices of Utah (lead recipient), Idaho, Colorado, and Montana (sub-recipients) a State Energy Program Competitive award (FOA-0001644) to facilitate a state-led assessment of organized market options in the West. The goal of the project was to provide Western states with a neutral forum, and neutral analysis, to evaluate generic market expansion options while enhancing regional dialog on the matter. A project "Lead Team" was formed to provide input and help guide the study process. The Lead Team was composed of representatives from the grant recipient states and from other Western states that elected to participate (Arizona, California, New Mexico, Nevada, Oregon, Washington, and Wyoming). Additionally, public stakeholder meetings were held on a quarterly basis to provide project updates and solicit stakeholder feedback. Energy Strategies was selected as the technical consultant to perform the study.

The study work culminated in a final "Roadmap," which is organized into two companion reports:

1. The Technical Report, which provides states with an independent, neutral, and state-specific technical evaluation of potential market outcomes that consider both services offered and footprint alternatives; and
2. The Market and Regulatory Review Report, which evaluates how different potential market structures might facilitate achievement of each state's energy policy objectives and how the market constructs may impact state jurisdiction in key areas.

Acknowledgments

The project team thanks the Western Interstate Energy Board for providing logistical support for several of the project's public stakeholder meetings.

Disclaimers

This publication was prepared based on Energy Strategies' independent study work—sponsored by the Utah Office of Energy Development (OED), sub-recipient states, and the U.S. Department of Energy—and is provided as is with no guarantees of accuracy. There are no warranties or guarantees, express or implied, relating to this work, and neither Energy Strategies, OED, sub-recipient states, Lead Team members, or the U.S. Department of Energy are liable for any damages of any kind attributable to the use of this Roadmap or other project materials. The Roadmap does not represent the views of OED, sub-recipient states, Lead Team members, or the U.S. Department of Energy or their employees.

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1. Introduction and Background

The Utah Governor's Office of Energy Development (OED) received a grant, in partnership with the State Energy Offices of Idaho, Colorado, and Montana, from the U.S. Department of Energy to facilitate a state-led assessment of organized electricity market options. The project is referred to as Exploring Western Organized Market Configurations: A Western States' Study of Coordinated Market Options to Advance State Energy Policies[1] or the "State-Led Market Study." The objective of the "State-Led Market Study" was to facilitate a neutral forum, and neutral analysis, for Western States to independently and jointly evaluate options and impacts associated with new or more centralized wholesale electricity markets and their footprints.

The project is composed of two primary pieces of work:

- Technical Modeling (which is summarized in the companion "Technical Report"); and
- Market and Regulatory Review

This document comprises the Market and Regulatory Review and includes the Market Factor Scorecards, which **evaluate how different potential wholesale market structures might facilitate achievement of each state's energy policy objectives**. The Market Factor Scorecards are based on two primary overarching state energy policy priorities, which were identified based on a review of participating state's key energy policies conducted in 2019. For each of the two overarching state energy policy objectives, several metrics/factors are assessed for each market construct, resulting in the "scorecards" included in this report. The report also includes a scorecard for how each market construct might impact the retention of state regulatory authority. While retaining state regulatory authority is not an explicit state policy preference, it has the potential to impact a state's ability to implement its other energy policy priorities and, thus, has been included in this report as a scorecard for ease of review by states and policy makers. Additionally, this report includes an appendix (Appendix 1) that provides findings based on research and analysis on likely approvals required for each market construct, as requested by the Lead Team.[2] This report and appendices comprise the final work products for the "Market and Regulatory Review" stream of work for this project.

2. Overview of Market Constructs and Assumptions

To perform the Market and Regulatory Review, it is first necessary to provide some definitions around each of the market constructs that will be evaluated. The more technical aspects and key modeling

[1] This project was originally entitled: A Western State's Strategic Roadmap for the Coordination and Control of Electric Transmission to Advance Affordable, Reliable Energy. But it has been renamed to better reflect the changed landscape of western market development efforts since the original grant application was compiled.
[2] The Lead Team is made up of up to two state representatives from the Lead State (Utah), grant sub-recipient states (Colorado, Idaho, and Montana), and from other Western states that have elected to participate (Arizona, California, New Mexico, Nevada, Oregon, Washington, and Wyoming). The Lead Team oversaw and guided this study effort and has been responsible for making key decisions during the project.

assumptions for each market are reviewed in the Technical Report which accompanies this document. But the key assumptions regarding these market constructs, which are likely to impact how each market construct does, or does not, contribute to achievement of the metrics for each overarching state policy objective, are reviewed here for the four different electricity market constructs that are assessed herein.

These market constructs are generalized and are intended to, at a high-level, capture qualities and benefits of different market options. Thus, it is important to understand that these generic market constructs will not, and are not intended to, capture the finer details of individual markets operated by different service providers. Consistent with the direction provided by the Lead Team in the Modeling and Analysis Request ("Request"), the Market and Regulatory Review does not specifically evaluate details of each market services proposal nor of potential market providers. Consequently, there may be differences in the underlying assumptions regarding a market construct and what is ultimately proposed or implemented by a particular market services provider.[3]

To support the Market and Regulatory Review, certain assumptions needed to be made about the underlying components of each of the market constructs. Table 1, below, outlines key assumptions regarding market constructs that are important for this assessment. A brief written overview of the market construct precedes the more detailed table of key assumptions regarding these markets.

Bilateral Market

A bilateral market is a market construct with no centralized, organized optimization of energy transactions. Trades of electricity occur "bilaterally" between two counterparties. This market construct generally has individual transmission tariffs and does **not** include Security Constrained Economic Dispatch (SCED).[4] This type of market construct is often characterized by fragmented operational responsibilities and multiple Balancing Authorities (BAs). The "bilateral only" market construct, still exists in some areas of the West (namely, those that are not yet participating in a real-time electricity market).

Real-Time Market

A real-time market is an electricity market that settles—determines the price—for time periods of one hour or less during the day of delivery.[5] In a real-time market, day-ahead unit commitment is not optimized across participants and non-real-time transactions continue to occur bilaterally. Examples of real-time markets include the Western Energy Imbalance Market (EIM) operated by the California Independent System Operator (CAISO) and the Western Energy Imbalance Service (WEIS) operated by the Southwest Power Pool (SPP).

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[3] For instance, the Day-Ahead Market construct evaluated in this study may or may not be consistent with the ultimate market design developed as part of the ongoing Extended Day-Ahead Market (EDAM) initiative.
[4] SCED determines the most economic dispatch of resources across the grid, taking into account constraints on the system and is generally utilized by organized wholesale electricity markets.
[5] FERC.gov

Day-Ahead Market

The concept of a day-ahead market outside of the construct of a formal Independent System Operator (ISO) or Regional Transmission Organization (RTO)[6] has been contemplated, but to date, has not been implemented in the U.S. Generally, it is expected that a day-ahead market would entail centrally optimized day-ahead unit commitment and real-time dispatch, but participants would continue to administer their own transmission tariffs and transmission planning functions and would retain operational/functional control over their transmission systems. A similar concept was proposed by the (now) Midcontinent Independent System Operator (MISO) in 2008[7] and is currently being contemplated by both the CAISO and the SPP.[8]

Regional Transmission Organization

An RTO or ISO is typically a non-profit organization that is tasked with ensuring reliability and optimizing electrical supply and demand bids for wholesale power in its footprint. ISO and RTO formation was primarily proposed, developed, and enhanced through various orders of the Federal Energy Regulatory Commission (FERC).[9] RTOs and ISOs do not own generation or transmission, but they do perform a variety of tasks including managing transmission and energy flows across the market footprint, performing transmission planning within the market footprint, ensuring reliable operation of the grid, and managing wholesale energy market transactions and cash flows within the market. Examples of ISOs/RTOs include CAISO, SPP, MISO, and PJM Interconnection.

The various market constructs are further summarized in Table 1, below.

[6] The terms ISO and RTO are under interchangeably within the context of this study.
[7] FERC Docket No. ER08-637
[8] CAISO is developing the EDAM through an ongoing stakeholder initiative and SPP is discussing a "Markets+" concept.
[9] Including FERC Orders 888, 889, and 2000

Table 1

Organized Market Type	Bilateral Market	Real-Time Market	Day-Ahead Market	RTO
Centrally optimized dispatch	No central optimization of electricity trades	Centrally optimized real-time dispatch; day-ahead unit commitment **not** optimized across participants	Centrally optimized real-time dispatch and day-ahead unit commitment	
Transmission tariffs	Individual transmission tariffs			Joint transmission tariff for participants in a given footprint
Transmission dedicated to market	Transmission rights required for all bilateral sales/purchases	Limited transmission dedicated to the market (other transactions must explicitly pay for transmission)		Transmission used up to reliability limit
Transmission Planning	Local transmission planning remains with individual transmission providers; regional planning and interregional coordination under Order 1000 remain as they are today			Joint transmission planning by RTO for full footprint for reliability, economic and public policy purposes; some lower voltage transmission planning remains at the local level (as is typical in RTOs)[10]
Operational/Functional Control of Transmission	Remains with individual transmission providers			RTO has operational/functional control of transmission
Reliability Obligations and Balancing Authority Boundaries	As they are today			RTO has primary reliability obligations; BAs are consolidated
Ancillary-Service Co-Optimization	No ancillary service co-optimization	Can, but does not have to, include ancillary service co-optimization and provision		Includes ancillary service co-optimization and provision in the market
Resource Adequacy Implications[11]	Addressed by individual regulators; no market requirement	Market addresses intra-hour resource sufficiency, but does not impact long-term resource adequacy planning and processes	Market addresses day-ahead resource sufficiency, but does not impact long-term resource adequacy planning and processes	Market will include its own longer-term resource adequacy requirements that must be achieved (states may have more stringent requirements, though states' exact roles will depend on the governance structure)

[10] ISOs/RTOs generally perform transmission planning and manage transmission flows across transmission of a certain voltage threshold. Transmission below that voltage threshold may be referred to as "distribution" and will continue controlled by and have local reliability planning performed by the applicable transmission owner. For instance, Southern California Edison's (SCE) transmission of 200 kV or higher is under CAISO's operational control and considered transmission, while most facilities between 50 kV – 200 kV are under SCE's control.
[11] A Resource Adequacy program could be added to the non-RTO market constructs, but the addition of such a program is not explicitly considered as a "part" of these markets.

Organized Market Type	Bilateral Market	Real-Time Market	Day-Ahead Market	RTO
Transparent Access to Market & Operational Information	Very little access to information, what is available is generally aggregated	Transparent access to pricing information for real-time transactions and transmission in the market	Transparent access to pricing information for day-ahead and real-time transactions and transmission in the market	Transparent access to pricing information for day-ahead and real-time transactions and transmission in the market
Ability for Large Commercial/Industrial Consumers to Enter into Power Agreements with Preferred Resource Types (outside of a utility green tariff program)	Unlikely (inability for resource to easily sell its output in a bilateral market)	Unlikely (resource can only easily sell its output in the real-time market)	Possible (resource can easily sell its output in the day-time market and trading hubs likely to be established)	Highly likely (resources can easily sell output to the RTO as we have seen in SPP, MISO, etc.)
Retail Choice	No change to existing retail choice programs and traditional, vertically-integrated utility service provision is assumed under these market structures (as retail choice is a separate policy consideration from market constructs)			

3. Overarching State Energy Policy Priorities

As part of the completion of the Request document in 2019, the Lead Team and the Contractor compiled a list of Western state key energy policy priorities and regulations. This list is included in this report, for reference, as Appendix 2. This review of state energy policy priorities suggested that participating Western states generally have two, high-level primary energy policy objectives:

1. Increased use of clean energy technologies[12]; and
2. Reliable, affordable provision of energy to consumers.

These two overarching energy policy priorities are ***not*** mutually exclusive, and many states are pursuing both policy priorities simultaneously. Some states may lean more towards one overarching goal or the other. Because each state may differently weight these two policy priorities, a Market Factor Scorecard has been produced for each of these two policy priorities. This is intended to allow states to individually consider their respective weighting of each policy priority in evaluating energy market constructs and how those might assist in meeting that state's energy policy priorities.

Although not explicitly a state energy policy priority, states also indicated an interest in the impacts of market constructs on state jurisdiction in key areas. At the request of the Lead Team, an additional scorecard regarding the ability to retain state regulatory authority over key jurisdictional elements under different market constructs was developed and is included in this report. This scorecard can help states assess how markets might impact their state jurisdiction over electricity related matters, which may contribute to a state's ability to successfully implement its energy policy priorities.

Each state likely prioritizes these three "goals" differently. And it should be reiterated that the three market factor scorecards are *not* mutually exclusive. Outlining how different wholesale market constructs are likely to contribute to these three goals will allow states to make their own value judgements between these different priorities and how each wholesale market construct might affect their individual objectives.

4. Market Factor Scorecard Overview and Analysis[13]

For each of the three different energy policy "goals" that make up the three Market Factor Scorecards, a set of metrics was developed. The metrics are individual elements which may contribute to achieving

[12] For purposes of this effort, clean energy technologies are generally defined as those electricity technologies which have low or no greenhouse gas (GHG) emissions and would include renewable resources such as wind, solar, storage, hydroelectric, geothermal, and other low/no GHG electricity resources.

[13] The Lead Team and Contractor wish to acknowledge and express appreciation to Jennifer Chen and the Nicholas Institute for Environmental Policy Solutions for outlining a logical and useful approach to assessing wholesale market options and how they contribute to state policy goals. The March 2020 paper entitled *Evaluating Options for Enhancing Wholesale Competition and Implications for the Southeastern United States* provided an inspiration for the approach utilized in these Market Factor Scorecards.

the broader energy policy goals. The metrics were developed by the Contractor in coordination with the Lead Team and were deemed the appropriate key metrics to assess for each overarching goal.

A ranking key was developed and utilized to rank how each of the market constructs might facilitate (or not facilitate) achievement of the individual metrics within each of the three market factor scorecards. A key to the rankings can be found in the table below. Some metrics received a "ranking range," to help account for the high degree of nuance and variables associated with some of the metrics.

It is important to be mindful that the following scorecards represent generalized scores that are based on simplified assumptions regarding market design. Invariably, the specifics of market designs, governance structures, and participating entities could have significant impacts on the scores and associated benefits.

Rankings for the Market Factor Scorecards	
Icon	**Meaning**
Excellent 	Market construct is expected to substantially support achievement of this metric
Very Good 	Market construct is expected to mostly support achievement of this metric
Good 	Market construct is expected to somewhat support achievement of this metric
Fair 	Market construct is expected to minimally support achievement of this metric
Poor 	Market construct is not expected to support achievement of this metric
**Note that multiple icons may be utilized to illustrate how a market construct contributes to the relevant metric, depending on the outcome of the assessment.*	

5. Increased Use of Clean Energy Technologies Market Factor Scorecard

This section outlines the metrics that were used to help assess whether a market construct is likely to contribute to the overarching goal of *increasing use of clean energy technologies*. This energy policy priority was evident in review of Western state energy policies, as many states have Renewable Portfolio Standards (RPSs) or other goals designed to increase the use of clean energy technologies across the grid. And, thus, it was determined a market factor scorecard would be helpful to understand how each market construct might help achieve *Increased Use of Clean Energy Technologies*. Six metrics were identified as important to helping achieve this overarching policy goal and the following subsections discuss how each market construct was ranked at helping achieve these metrics.

Efficient grid operation which allows low (and zero) marginal cost resources to be dispatched and reduces overall costs of integrating clean electricity technologies

Ability of Market Construct to Support Increased Use of Clean Energy Technologies	Bilateral	Real-Time	Day-Ahead	RTO
Efficient grid operation which allows low (and zero) marginal cost resources to be dispatched and reduces overall costs of integrating clean energy technologies	*Fair*	*Good*	*Very Good*	*Excellent*

Many of the states (or portions thereof) that make up the Western Interconnection have ambitious renewable and/or clean energy goals. To maximize production of these technologies, a market construct should promote efficient grid operation and dispatch zero and low marginal cost resources (such as wind and solar). Market constructs can also support increased use of clean energy technologies by reducing the costs associated with integrating these technologies onto the grid. The use of SCED, which is used in organized market constructs, can help ensure that low and zero marginal cost resources are dispatched. The more time horizons SCED is utilized on, the more likely low and zero marginal cost resources are to be utilized. Additionally, the fewer hurdles there are to dispatching these resources across the footprint, the more likely they are to be dispatched.

Bilateral: A bilateral only market construct generally involves individual BAs optimizing generation within their own footprint (or remote generation to which they have associated transmission rights). Other generation, including low and zero marginal cost clean energy resources are typically only utilized if their costs, including transmission wheeling costs necessary to access them, are lower than other options available. Locating and transacting for generation from other parties in the bilateral construct can be a rather manual process. With the 39 BAs and 63 transmission providers in the Western

Interconnection,[14, 15] a bilateral market likely misses opportunities to utilize low or zero marginal cost clean energy resources and increases curtailment of these resources relative to other market constructs. Additionally, integrating these resources across 39 different areas is unlikely to reduce integration costs and likely causes such costs to be higher than they would be if optimization and resource sharing occurred across a larger footprint. ***Thus, a bilateral market is ranked as "fair" in achieving this metric.***

Real-Time: A real-time market helps to improve the dispatch and utilization of low and marginal cost resources and reduces their curtailment by utilizing SCED for real-time transactions. For example, as a result of being able to share, in real-time, resources' output across a larger footprint, the Western EIM has seen, since 2015, 1,400,055 MWh in avoided curtailments in the CAISO's footprint, with an associated avoided emissions of 599,144 metric tons of CO_2.[16] The centralized dispatch and optimization of resources and ability to share resources across the footprint of a real-time market should also decrease the costs of integrating clean energy technologies. Compared to the day-ahead and RTO market constructs, a real-time market is limited in its ability to accomplish these things because not all generation in the footprint is necessarily participating in the market, the ability to centrally optimize is only in real-time, and there is a limited amount of transmission available to the market. ***Thus, a real-time market is "good" at promoting efficient grid operation, including dispatching low and zero marginal cost resources and reducing costs of integrating clean energy resources.***

Day-Ahead: A day-ahead market further increases the ability to support efficient grid operation beyond what is offered by a real-time market. This occurs in several ways, first, from the likely increased availability of free (or low cost) transmission within the market. This allows more sharing of free and low marginal cost resources across the footprint. Additionally, the ability to make unit commitment decisions on a day-ahead basis across a larger footprint should allow additional zero or low marginal cost energy to be utilized more fully and should further reduce curtailments of clean energy technologies. For instance, an Arizona gas plant may not need to be committed if that utility can count on exports of California solar at key hours. And the California solar may have otherwise been curtailed, due to the Arizona gas plant being online, had it not had the opportunity to serve the needs of the Arizona entity. ***A day-ahead market is ranked as "very good" at achieving this metric. Its actual ability to do so will depend on market design and the amount of generation and transmission committed to the market. As generation and transmission in the market increases, a day-ahead market will begin to converge with the benefits an RTO offers for this metric.***

RTO: Of these market constructs, an RTO is expected to provide the greatest ability to achieve efficient grid operation, which allows zero and low marginal cost resources to be dispatched and reduces overall costs of integrating clean energy. An RTO best facilitates achievement of this metric because it generally

[14] Western Electricity Coordinating Council (WECC): Western Interconnection Balancing Authorities Map
[15] NERC: Compliance Registry Activity Report (April 2, 2021 – May 14, 2021)
[16] CAISO: Western EIM Quarterly Benefits Report, Q1 2021

optimizes all generation in the footprint (outside of self-schedules[17]) and can utilize all available transmission, which may be limited in other market constructs. Integration of these resources, including the ancillary services to support them, can be co-optimized with the dispatch of zero and low marginal cost energy resources. ***Thus, a real-time market is "excellent" at promoting efficient grid operation, including dispatching low and zero marginal cost resources and reducing costs of integrating clean energy resources.***

Lower barriers to access new generation in high-quality renewable resource locations

Ability of Market Construct to Support Increased Use of Clean Energy Technologies	**Bilateral**	**Real-Time**	**Day-Ahead**	**RTO**
Lower barriers to access new generation in high-quality renewable resource locations	*Poor*	*Poor*	*Good*	*Excellent*

States seeking to increase the use of clean energy technologies may be interested in accessing new renewable resources located in the West's highest quality resource areas. These locations, where high-capacity factor resources (such as wind and solar) are located are often remote from load centers and may be remote from the states that seek to access them. For clarity, this metric is focused on access to ***new generation***. It also does not attempt to account for all the nuances in individual state policies that may come into play as states seek access to new clean energy resources in various locations across the West (e.g., delivery requirements for state RPSs). These individual state requirements will be important considerations for each state in considering discrete market proposals but, at a high-level, such requirements are not instrumental to achieving the overarching policy goal of increasing use of clean energy technologies, which is evaluated in this scorecard. Thus, the rankings of the market constructs are based on the general ability to lower barriers to accessing new generation in high-quality resource locations.

Bilateral: As discussed above, a bilateral market requires the utilities interested in accessing remote generation to acquire transmission (or repurpose existing transmission rights) to those areas. Under a bilateral market, this can create challenges in accessing new generation in high-quality renewable resource locations by increasing the transmission costs to reach those areas, frequently including the pancaking of transmission rates. Additionally, the bilateral construct that exists in the West generally

[17] Self-scheduling occurs when a market participant commits a resource to provide energy in an hour regardless of whether the market operator would have dispatched the resource. The resource becomes a price taker for the output which is self-scheduled into the market.

relies on the contract path methodology[18] for using transmission rights, which reduces the number of resources that can be accommodated on a fixed amount of transmission capacity compared to approaches used in organized market constructs. ***Therefore, a bilateral market is ranked as "poor" in lowering barrier to access new generation in high-quality renewable resource locations.***

Real-Time: A real-time market does not substantially change the ability for load serving entities to access ***new*** generation in high-quality renewable resource locations. The addition of new renewable generation resources generally requires a long-term agreement to purchase the resource's output. And while a real-time market may increase the use of renewable generation that is already on the system, a real-time market has not been demonstrated to address the underlying bilateral market barriers that exist for new, remote, renewable resource development. A real-time market does not, for instance, eliminate transmission rate pancaking or the use of the contract path methodology of determining transmission availability on a ***long-term*** basis. ***Thus, a real-time market is ranked the same as a bilateral market, "poor," at achieving this metric.***

Day-Ahead: The degree to which a day-ahead market will help achieve this metric is highly dependent on how that day-ahead market is designed. It is plausible that a day-ahead market could be designed in a manner that can reduce some of the barriers to new, remote, renewable resource development that exist in a bilateral or real-time market. A day-ahead market may, for instance, include an ability for participating entities to "trade" resource qualities, as is being conceptualized in the CAISO's Extended Day-Ahead Market (EDAM) resource sufficiency evaluation framework, and the market design which enables these trades may help eliminate some of the transmission-related barriers to accessing new, remote generation resources that exist in a bilateral or real-time market. A day-ahead market could also be designed in a manner that transitions long-term transmission rights into financial transmission rights, allowing increased use of transmission capacity and increasing the amount of resources that can rely on a given quantity of transmission capacity. However, regardless of market design, it is important to note that these features would likely be part of a "voluntary" market, which may make long-term contracting that relies on the market's structure riskier than it would be in a market construct with more long-lasting participation decisions (such as an RTO). ***Thus, a day-ahead market may be "good" at facilitating access to new high-quality renewable resources with actual market design specifics potentially increasing or decreasing the market's effectiveness on this metric.***

RTO: Of these market constructs, an RTO can provide the most ability to lower barriers to access new generation in high-quality renewable resource locations. Assuming that the high-quality renewable resource locations are within the RTO footprint, an RTO should eliminate the barrier of rate pancaking for all available transmission – providing increased economic access to new, remote renewable

[18] The North American Energy Standards Board (NAESB) defines a contract path as a predetermined Transmission Service electrical path between contiguous Transmission Service Providers established for scheduling and commercial settlement purposes that represents the continuous flow of electrical energy between the parties to a transaction. See NAESB Business Practices.

resources. An RTO should also effectively eliminate the use of the contract path methodology, resulting in an increased ability to accommodate renewable resources on a given amount of transmission capacity. Additionally, in contrast to the other market constructs, an RTO includes centralized transmission planning across the footprint, which may be more likely than other market constructs to result in the development of new transmission across a footprint large enough to access high-quality renewable resource locations and deliver them to large load centers.[19] ***Thus, an RTO is ranked as "excellent" at lowering barriers to new generation in high-quality renewable resource locations.***

Opportunities for clean electricity resources to be added to the grid (e.g., direct customer access to renewable/clean resource power purchase agreements)

Ability of Market Construct to Support Increased Use of Clean Energy Technologies	Bilateral	Real-Time	Day-Ahead	RTO
Opportunities for clean electricity resources to be added to the grid (e.g., direct customer access to renewable/clean resource power purchase agreements)	*Good*	*Good*	*Very Good*	*Excellent*

States which seek to increase the use of clean energy technologies are likely interested not only in achieving their own state renewable/clean energy goals, but also in helping facilitate the clean energy goals of municipalities, corporations, universities, and other entities. This can be achieved through a variety of different mechanisms including utility green energy tariffs, which are optional programs offered by utilities and approved by State Public Utility Commissions (PUCs or "State Commissions") that allow larger commercial and industrial customers to buy bundled renewable electricity from a specific project (or set of projects) through a special utility tariff rate.[20]

In any of the market constructs evaluated in this report, utilities can offer green energy tariffs to different types of consumers. This happens in the West today (with and without a real-time market in place) and should continue to be available under a day-ahead or RTO market construct. For instance,

[19] Non-RTO market constructs are more reliant on individual utility transmission plans (which generally cover smaller footprints) and on FERC Order 1000 regional planning and interregional coordination. There has been some recent criticism of Order 1000's effectiveness, especially with respect to interregional planning. See, for instance,: Utility Dive: 'No compelling reason not to': Former FERC chairs, commissioners call for federal transmission overhaul

[20] Examples of utility green tariffs include: Rocky Mountain Power's Utah Schedules 32, Schedule 34, and Public Service Company of New Mexico's Green Energy Rider.

Rocky Mountain Power is working with various municipalities in Utah to create a green energy tariff that will allow these municipalities to achieve 100% clean energy goals.[21] This is in addition to other green tariffs available to larger customers of Rocky Mountain Power's in Utah.

Corporate renewable buyers in other regions of the country have also increasingly signed creative power purchase agreements (PPAs) to facilitate the achievement of their goals and increase the quantity of renewable resources on the electrical grid. One popular construct is a virtual PPA,[22] which allows a customer or set of customers to facilitate the addition of new renewable generation to the grid. A simplified way of describing these contracts is that the renewable energy owner sells its output into a liquid energy market and the customer either pays some additional amount above the market price to achieve the contracted price or is paid by the renewable energy developer if the market revenue is above the contract price.[23] These types of constructs, however, require a liquid market (with many buyers and sellers and comparatively lower transaction costs) for the renewable project to sell into. An RTO market provides this type of liquid market. This may be part of the reason that roughly 80% of corporate PPAs have taken place in these types of markets.[24]

This metric evaluates how each market construct might help increase the opportunities for consumers to meet their own clean energy goals through green tariffs and/or providing opportunities for virtual PPAs or other transactions.

Bilateral: As explained above, green tariffs can be used to meet the needs of consumers interested in clean energy goals, creating opportunities to add clean energy resources to the grid. However, other options that can be utilized in highly liquid markets are limited by the illiquidity and rigidity in transaction structure, and transmission delivery requirements of bilateral markets. In some areas of a bilateral market construct, large customers may have "direct access" to the wholesale market, which could enable the customer to select a portfolio of clean energy resources, but those opportunities are rather limited in the Western Interconnection today.[25] ***Thus, a bilateral market is ranked as "good" at achieving this metric as some options are available, but there are not as many opportunities for consumers to add clean electricity resources to the grid as there are with other market constructs.***

Real-Time: Similar to the bilateral market, under a real-time energy market, green tariffs can be used to meet consumer's clean energy goals and add clean resources to the grid. Real-time markets are unlikely to significantly open other avenues of direct consumer access to clean resources as real-time markets

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[21] See, for instance: Utah 100 Communities
[22] Virtual PPAs are also sometimes known as financial or synthetic PPAs, a contract for differences, or a fixed-for-floating swap.
[23] A summary and informative graphic can be found at EPA.gov.
[24] See the quote from the Renewable Energy Buyers Alliance in Utility Dive: Google, GM, other REBA members push to expand organized wholesale markets to spur renewables.
[25] As a reminder, this assessment is not evaluating any changes to direct access/customer choice policies, which is a separate consideration from the different organized market constructs.

are voluntary. The voluntary nature of real-time markets creates a risk that market participation could be ended in the midst of a resource's useful life, and this risk likely makes financing of any long-term agreement that relies on the market very challenging. Real-time markets are also generally not designed to accommodate the full output of new resources being sold directly into the market. ***Thus, like a bilateral market, a real-time market is ranked as "good."***

Day-Ahead: Depending on the market design, the addition of a day-ahead market may help expand new contracting opportunities, like virtual PPAs, for consumers seeking to add clean energy resources to the grid. However, the currently envisioned voluntary nature of a day-ahead market, may make the achievement of this type of long-term contracting structure a challenge under this market construct, just as it is under a real-time market. The day-ahead market is still ranked slightly above the bilateral and real-time market for facilitating achievement of this metric, because it is likely to open additional possibilities for clean energy resources to be added to the grid to meet consumers' clean energy goals, including by likely increasing the ability of resources, including clean energy resources, to utilize the existing transmission system. ***Thus, a day-ahead market is ranked as "very good."***

RTO: An RTO market construct, because of the liquid and certain nature of the market, offers the additional ability to facilitate virtual PPAs, increasing this market construct's ability to achieve the metric of offering expanded opportunities for clean energy resources to be added to the grid. RTO regions have seen significant growth in virtual PPA constructs, which has led to substantial additions of clean resources to the grid. ***Therefore, the RTO construct received an "excellent" ranking in this metric.***

Provides financing opportunities and a variety of revenue stream opportunities for clean electricity technologies

Ability of Market Construct to Support Increased Use of Clean Energy Technologies	Bilateral	Real-Time	Day-Ahead	RTO
Provides financing opportunities and a variety of revenue stream opportunities for clean electricity technologies	*Fair*	*Good*	*Very Good*	*Excellent*

States that wish to increase the use of clean energy technologies can help achieve that goal through enhancing financing opportunities and providing additional revenue streams to clean energy technologies, which may help bring more clean energy resources online. Creating new opportunities to finance the construction of clean energy projects, such as the ability to enter into virtual PPAs (as discussed in the prior metric), can help bring additional clean energy technologies online. Additionally, if more revenue stream opportunities are created, this may help finance additional projects and/or may reduce the cost of clean energy technologies, helping increase their deployment. While it may be true

that many of these additional revenue streams would generally be retained by the counterparty to the PPA (and not the clean energy resource itself), the addition of new revenue streams may open up additional development paths for these resources.

This metric evaluates the ability of different market constructs to support new financing opportunities and to provide more revenue streams, as this may be one way to enhance development of clean energy resources.[26]

Bilateral: As discussed in the prior metric, in a bilateral market, the primary financing mechanism for development of new clean electricity resources is a PPA with a utility and/or with a customer (generally through a utility's green tariff). Under a bilateral market, financing new resources utilizing a virtual PPA is not nearly as accessible as it is in other market constructs given that the bilateral market is fairly illiquid and often includes rather rigid trading structures (for instance, the bilateral market often transacts in "blocks" such as a 16-hour on-peak block of energy). These rigid trading structures may be difficult for clean energy technologies to transact around. Revenue streams for clean energy resources in a bilateral market are often limited to the PPA price and, generally, there are not easily accessible revenue streams for other services that might be provided by clean energy technologies to reduce their cost or help increase financing opportunities. ***Thus, a bilateral market is ranked as "fair" in achieving this metric.***

Real-Time: Financing opportunities in a real-time market are unlikely to be significantly changed from a bilateral market. Financing of clean energy project based solely on liquidating energy into a voluntary, real-time market appears unlikely. However, a real-time market can provide opportunities to sell incremental real-time output at market prices. Real-time markets might also include some ancillary service components, which could offer limited additional revenue streams to clean energy resources, potentially helping improve their economics. The existence of a real-time market could also include the potential for resources to sell into the real-time market after the expiration of the original PPA. ***Thus, a real-time market is ranked as "good."***

Day-Ahead: A day-ahead market is generally expected to include the same financing opportunities for clean energy technologies as a bilateral or real-time market. However, financing based on liquidation of a resource's energy is expected to be more likely in a day-ahead market construct than in a real-time market – though the actual ability to do so will ultimately depend on the specifics of the day-ahead market design. Furthermore, day-ahead markets are more likely to include additional ancillary service components, which may offer additional revenue streams for clean energy resources – potentially

[26] To be clear, this metric is not exclusively focused on "merchant" opportunities for these resources. A "merchant" is a generation resource which does not have a PPA with an offtaker and, instead, is financed based on a plan to rely on revenue from the wholesale market. This metric is simply focused on increasing financing opportunities and revenue streams available to clean energy resources (whatever those may be). It is possible some of these market structures would make "merchant" projects more viable, but that is not central to the rankings of the market constructs for this metric.

including revenue for provision of reserves and frequency response. There is also a greater potential for capacity-based revenue sources in a day-ahead market. The addition of potential revenue streams in a day-ahead market may create more financing opportunities and/or may provide revenue streams that could decrease costs of clean energy technologies under this market construct. ***A day-ahead market is, therefore, ranked as "very good."***

RTO: The RTO construct appears to offer the greatest number of potential financing opportunities and a variety of revenue stream opportunities for clean electricity technologies. As discussed above, RTOs provide the clearest path for financing new projects through the use of virtual PPAs. Furthermore, depending on market design, a full suite of day-ahead, real-time, and ancillary service revenue streams are expected to be available under an RTO construct. RTOs also can, though they do not have to, provide capacity-based revenue streams with a joint resource adequacy construct or other capacity mechanism.[27] ***Given the potential financing opportunities that open up in this construct and higher likelihood of new revenue streams that could reduce total cost of clean energy resources, the RTO construct received a score of "excellent" on this metric***.

Economically facilitates emissions reduction goals/requirements via market signals

Ability of Market Construct to Support Increased Use of Clean Energy Technologies	Bilateral	Real-Time	Day-Ahead	RTO
Economically facilitates emissions reduction goals/requirements via market signals	*Fair*	*Good*	*Very Good*	*Excellent*

States with a policy objective to increase use of clean electricity technologies may sometimes also have a goal of reducing greenhouse gas (GHG) emissions from the electricity sector (or economy-wide). For instance, California has a cap-and-trade program to reduce GHG emissions across the economy in addition to its RPS and clean energy goals. Under the cap-and-trade program generators that emit GHG and are located inside of California include, in their energy bid price, the cost of purchasing allowances necessary to comply with the cap-and-trade program and cover their emissions.[28] By including the costs of emission allowances in bids, the market can consider the costs of the associated GHG emissions and help economically facilitate achievement of the state policy.. Various market constructs may be able to

[27] Capacity payments might also occur in other market construct but are generally more likely to come to fruition in an RTO and may also be more likely to provide capacity payments to renewable energy and certain types of demand response technologies.
[28] Imports into California must also comply with the cap-and-trade program and are required to submit GHG allowances for their emissions.

assist in economically reducing emissions via market signals, though the extent to which they do so depends on whether there is central optimization in the market and how many transactions are centrally (and economically) optimized.

All electricity market constructs, from bilateral to RTO, must contend with the specifics of state emission reduction goals, the interconnected nature of the transmission system, GHG accounting challenges, and differences between state policies. State programs to reduce GHG emissions from the electricity sector can be challenging to implement in any electricity market construct, as tracking electricity transactions across states can present difficulties, market optimizations/transactions are generally not designed to assign generation output to a specific load, and states are likely to have different GHG reduction goals, programs, and associated rules. Therefore, state coordination will be critical in any efforts to resolve potential GHG accounting issues in various organized market constructs.[29]

While acknowledging the complications of GHG accounting and reconciling individual state policies, this metric is **not** focused on the nuances of individual state GHG accounting frameworks and, instead, is aimed at assessing whether, the market construct is capable of economically facilitating the reduction of GHGs through the addition of GHG emissions costs into generation optimization decisions (e.g., market signals). Economically achieving emissions reductions goals under a market construct that is not centrally optimized is least likely to help facilitate low-cost achievement of the emissions reduction goal. As centrally optimized dispatch increases, the ability to economically achieve emission reduction goals should also increase, as the central optimization can account for the costs associated with GHG emission allowances or potentially include a constraint to achieve a GHG goal. The *ability* of a market to use economic signal to efficiently reduce GHG emissions is the primary focus of this metric and subsequent rankings.

Bilateral: Simply put, the lack of central optimization of generation dispatch in a bilateral market is unlikely to result in the most economic outcome for achieving emissions reductions goals through market signals. However, bilateral market participants still take costs into account in making transaction decisions and, thus, a GHG price may provide some market signals to help economically facilitate GHG reductions. However, the economic impacts of those decisions will not be centrally optimized. ***Thus, a bilateral market is ranked as "fair."***

Real-Time: The increased central optimization of real-time bids that occurs in a real-time market can facilitate more economic achievement of emissions reductions goals than a bilateral market construct. However, a real-time market construct is less likely to economically facilitate GHG reductions via market signals than a day-ahead or RTO construct due to the relatively small number of transactions that are part of the real-time market's central optimization. Bilateral transactions outside the real-time market will generally occur the same as they would in a bilateral market. ***A real-time market is ranked as***

[29] The Center for the New Energy Economy WIRED GHG Accounting Working Group Report provides more information on the challenges around individual state programs GHG accounting frameworks.

"good" at economically facilitating GHG emissions reductions via market signals, as it represents an improvement over a bilateral market construct with the addition of central optimization for real-time transactions.

Day-Ahead: Under a day-ahead market construct additional transactions become centrally optimized allowing the market to consider the emissions impacts, and associated costs, of emission intensive resource start-ups (for instance), while also optimizing a larger number of transactions through a centralized platform. Central optimization of day-ahead and real-time bids within the market can facilitate more economic achievement of emissions reductions goals with more transactions being centrally optimized. However, not all transactions are expected to flow through the market in a day-ahead market and some bilateral/outside the market transactions would remain and may not be as efficient as achieving GHG reductions through market signals than those transactions that occur within the market. ***Thus, a day-ahead market is ranked as "very good."***

RTO: With more transactions included in the market and centrally optimized under an RTO, economic achievement of emission reductions goals through market signals is more likely to be achieved in an RTO than under the other market constructs. Though some self-scheduling will likely occur in the RTO, it is expected those transactions will be fewer than self-schedules plus outside market transactions in a day-ahead market construct and, thus, an RTO would represent an improvement in utilizing market signals to efficiently reduce GHG emissions. ***Therefore, in this metric, the RTO construct was scored "excellent" for its ability to economically facilitate GHG reductions via market signals.***

Transparent and timely information on pricing, resource operations, and emissions

Ability of Market Construct to Support Increased Use of Clean Energy Technologies	Bilateral	Real-Time	Day-Ahead	RTO
Transparent and timely information on pricing, resource operations, and emissions	*Fair*	*Good*	*Very Good*	*Excellent*

States that are seeking to increase use of clean energy technologies can benefit from the provision of information on a timely basis. Transparent and timely information on electricity pricing, resource operations, and GHG emissions can help inform additional policies or actions that the state may be able to take to further its clean energy goals. Each of the four market constructs offer different levels of transparency on electricity pricing, resource operations, and emissions information. The expected availability and timeliness of this information is used to rank the market constructs for this metric.

Bilateral: A bilateral market offers some transparency into pricing, resource operations, and emissions, but generally through a less centralized party than a market operator and/or on a less timely basis than might be observed in the other market constructs. Market prices, for instance, are generally only report

at limited locations (such as trading hubs) and provide aggregated and averaged information (e.g., weighted average price, high price, low price, volume). Furthermore, information on resource operations and emissions becomes available in a bilateral market, but typically only through means outside of the market construct itself, such as required reporting by the Energy Information Administration (EIA) or the Environmental Protection Agency (EPA). And the information that is made available may not always be delivered in the timeliest fashion (relying on monthly or yearly reporting requirements, for instance). A bilateral market, therefore, offers minimal transparency into pricing and often delayed reporting of other information on resource operations and/or emissions. ***Thus, the bilateral market was scored "fair."***

Real-Time: In addition to the information that is made available in bilateral markets, more granular and current information on real-time prices at a variety of locations is generally released in a timely manner in a real-time market, increasing price transparency through this market construct. Though some resource operations and emissions information may be available from the market operator, it will generally continue to come from other sources as it does in a bilateral market. In a real-time market, information is generally provided regarding transmission congestion, which represents an improvement over the bilateral market. ***Thus, a real-time market is ranked as "good" under this metric.***

Day-Ahead: Compared to a real-time market, day-ahead market is expected to provide timely access to both day-ahead and real-time prices at more locations, since more generation resources are expected to actively bid into the market (creating new pricing nodes that may be less likely to be reported in a real-time market). Additionally, the day-ahead market may provide increased information on resource operations and, potentially, emissions on a timely basis from the market operator. It also anticipated that information regarding transmission congestion would be made available in a timely fashion under a day-ahead market. ***Thus, a day-ahead market is ranked as "very good."***

RTO: Given that an RTO would generally require resource participation and bidding (or self-scheduling), across the footprint, there would likely be additional pricing transparency into more locations under this market construct than under any of the other options. Similar to the day-ahead market construct, an RTO may provide additional information on resource operations and, potentially, emissions. It is also anticipated that information regarding transmission congestion would be made available in an RTO construct. Furthermore, FERC Order 844 requires RTOs to report uplift payments and resource commitment decisions, among other items. Though different RTOs have different policies on the release of operational data and the timing of such releases, of these market constructs, an RTO is anticipated to provide the most transparent and timely access to information. ***An RTO is, therefore, ranked as "excellent."***

Summary Scorecard for Increased Use of Clean Energy Technologies

In sum, this scorecard sought to assess how the various market constructs may contribute to increasing the use of clean energy technologies by assessing six different metrics. Generally, across all six metrics, moving toward more centrally optimized dispatch increases the score of a given market construct. In particular, the day-ahead and RTO constructs are more likely to promote more efficient dispatch, allow

for new financing opportunities, provide enhanced market signals, and increase transparency around pricing, operations, and emissions. That said, it should be noted again that the scorecard represents generalized assumptions regarding each market construct, and actual benefits of a proposed market will be dependent on its ultimate design.

Summary Market Factor Scorecard for Increased use of Clean Energy Technologies

Increased Use of Clean Energy Technologies	Bilateral	Real-Time	Day-Ahead	RTO
Efficient grid operation which allows low (and zero) marginal cost resources to be dispatched and reduces overall costs of integrating clean energy technologies	*Fair*	*Good*	*Very Good*	*Excellent*
Lower barriers to access new generation in high-quality renewable resource locations	*Poor*	*Poor*	*Good*	*Excellent*
Opportunities for clean electricity resources to be added to the grid (e.g. direct customer access to renewable/clean resource power purchase agreements)	*Good*	*Good*	*Very Good*	*Excellent*
Provides financing opportunities and a variety revenue stream opportunities for clean electricity technologies	*Fair*	*Good*	*Very Good*	*Excellent*
Economically facilitates emissions reduction goals/requirements via market signals	*Fair*	*Good*	*Very Good*	*Excellent*
Transparent and timely information on pricing, resource operations, and emissions	*Fair*	*Good*	*Very Good*	*Excellent*

6. Reliable, Affordable Provision of Energy to Consumers Market Factor Scorecard

This section outlines the metrics that were used to help assess whether a market construct is likely to contribute to the overarching goal of *Reliable, Affordable Provisions of Energy to Consumers*. Many Western state energy policies included, explicitly or implicitly, goals of providing reliable and affordable electricity. This market factor scorecard is intended to help states assess how each market construct might support the provision of affordable, reliable energy. Eight metrics were identified as important to helping achieve this overarching policy goal, as discussed in the subsequent subsections.

The following subsections provide additional detail and nuance around how the study arrived at each score and discusses some of the caveats associated with the scores. Please see the companion Technical Report for a quantification of on how the various market constructs (over different hypothetical market footprints) are expected to impact adjusted production costs on a state-by-state basis.

Efficient grid operation which reduces costs and increases flexibility of transactions

Ability of Market Construct to Support Reliable, Affordable Provision of Energy to Consumers	**Bilateral**	**Real-Time**	**Day-Ahead**	**RTO**
Efficient grid operation which reduces costs and increases flexibility of transactions	*Fair*	*Good*	*Very Good*	*Excellent*

States with policies aimed at reliable, affordable provisions of energy to consumers may be interested in ensuring efficient operation of the grid which reduces costs. To a certain extent, this metric is captured in this project's technical studies and results, which include quantification of adjusted production cost savings on a state-by-state basis for a variety of different market configurations. However, the structure of the production cost modeling tool, approximates in some instances, but does not fully capture bilateral markets including the operational realities of contract path scheduling and transactional inflexibility associated with standard trading blocks[30] for transacting bilateral power. The production cost model, therefore, tends to overestimate the flexibility that is available outside of an organized wholesale market and, thereby, may potentially underestimate the benefits of organized market constructs. This metric builds on the quantification of benefits associated with efficient grid operations

[30] The bilateral market often trades in blocks of power (e.g., 16-hour on-peak and 8-hour off-peak blocks), but that trading rigidity is not reflected in the modeling of bilateral trades in the production cost model.

included in the Technical Report by addressing, from a qualitative perspective, market constructs' ability to support efficient grid operations, flexible transactions, and reduced costs.

Bilateral: In a bilateral market, individual BAs optimize generation in their footprint, and there is a relatively manual process of determining the optimal generation to dispatch. Generally, resources external to the BA footprint (or to the utility in question) are only used if the price plus the transmission wheeling costs (which can be pancaked if they cross multiple transmission providers) are economic. This approach does not facilitate the minimization of generation costs on the system. Furthermore, transmission usage to facilitate trades in a bilateral market is generally limited by the contract path method of determining transmission availability. Finally, under a bilateral market construct, many transactions are limited to "block" trades, and parties interested in transacting may need to do so for periods for which they would not choose to. For instance, in a bilateral construct, an entity may wish to purchase additional energy only for an hour or two of the day but may have to transact for the full 16-hour on-peak period in order to ensure power deliveries during the hour or two of need. ***Given these factors, a bilateral market is ranked as "fair" in achieving this metric.***

Real-Time: A real-time market can eliminate or reduce transmission wheeling rates and rate pancaking for transactions that occur within the market and on the amount of transmission that is available to the market. The real-time construct provides the ability for BAs to use some external generation without wheeling or pancaking of transmission rates, thereby increasing efficiency. Outside of the real-time construct, longer-term trades continue bilaterally (with limited flexibility and most "block" trades). However, real-time trades add flexibility and efficiency across the market footprint. ***Thus, a real-time market is ranked as "good" as it represents an improvement over a bilateral market.***

Day-Ahead: Transactions in a day-ahead construct can be centrally and economically optimized and it is assumed there will be more transmission available to a day-ahead market than a real-time construct (but less so than in an RTO). The day-ahead market opens up the ability for participating entities to plan to use external generation in a day-ahead timeframe with the potential for reduced wheeling or pancaking of transmission rates associated with those transactions. Additionally, a day-ahead market would provide greater flexibility in transactions on a day-ahead basis, with more frequent (i.e., hourly plus intrahour) trades taking place via the market optimization, reducing the need to rely on inflexible block trades. ***Given these factors, a day-ahead market is ranked as "very good."***

RTO: Of all the market constructs, an RTO offers the highest level of flexibility for hourly and intrahour transactions and enables the greatest ability to eliminate transmission wheeling/pancaking across the most transactions. In an RTO, the vast majority of transactions are expected to be centrally and economically optimized by the market operator, utilizing the capability of the transmission system up to its reliability limits and transitioning from contract path methodology to more full utilization of the transmission system with use of financial transmission rights. Furthermore, BA consolidation allows for maximum sharing of ancillary services across the footprint, which is expected to reduce costs. ***Given all of this, an RTO is ranked as "excellent" with respect to achieving efficient grid operations with reduces costs and increases flexibility of transactions.***

Ability to unlock the full potential of existing generation (lowering costs) and decrease generation capital costs/investments

Ability of Market Construct to Support Reliable, Affordable Provision of Energy to Consumers	Bilateral	Real-Time	Day-Ahead	RTO
Ability to unlock full potential of existing generation (lowering costs) and to decrease generation capital costs/investments	*Poor*	*Fair*	*Good*	*Very Good*

This metric is focused on the relative efficiencies that market constructs can bring, reducing costs and increasing reliability, from more efficient use of existing ***generation*** and their ability to reduce the need for future ***generation*** investments. The subsequent metric focuses on efficiencies related to the transmission system.

A system that can optimize existing generation in an economic manner and reduce the chances of curtailing low or zero marginal cost energy will perform well under this metric. Additionally, market constructs that allow for pooling of reserves and sharing of resources across a broader footprint can also help reduce the need to build new generation resources and thus will also score well under this metric. The Technical Report for this project includes quantification of potential capacity savings under different market constructs. Securing capacity savings is less certain under the non-RTO market constructs, as it is only the RTO which has been clearly demonstrated to take advantage of load diversity and reduce planning reserve margin requirements. Thus, these rankings build on the quantification of capacity savings in the Technical Report by considering qualitative factors as well.

Bilateral: Bilateral markets, with pancaked transmission rates, use of contract path methodology, and generation optimization taking place at the individual BA level, are most likely to require curtailments of low and zero marginal cost generation resources. Therefore, this market construct fails to unlock the full potential of existing generation on the system. Furthermore, in a bilateral market, unlocking external generation is often limited due to transmission wheeling cost barriers. Seams and lack of coordination between BAs also increase the need to hold extra generation in reserve, to achieve reliability standards and/or to meet longer-term planning reserve margins. As such, higher reserve margins tend to be necessary to maintain reliability in a bilateral market construct, which may increase the need for new generation investments relative to other market constructs. Generation investments may also be less efficient, as they are less likely to have been coordinated/optimized across neighboring areas. ***Therefore, a bilateral market is ranked as "poor" at unlocking the full potential of existing generation and decreasing the need for future generation investments.***

Real-Time: The real-time market construct unlocks additional generation capabilities by introducing bidding opportunities in real-time via introduction of a real-time SCED. For a real-time market, SCED optimization is generally limited to 5-10% of transactions; therefore, much of the generation system remains optimized in the same manner as in a bilateral market. Real-time markets, like the EIM, have shown they can reduce curtailments, helping to unlock the potential of the existing generation system. In the real-time market construct, individual BAs still hold reserves and are responsible for ensuring reliability in their area. Though, some optimization and sharing does occur in real-time, planning reserve margins in a real-time market are expected to be substantially similar to bilateral markets. As with a bilateral market, a real-time market is less likely than more comprehensive organized market constructs to reduce the need for new generation investment.[31] And as with a bilateral market, generation investments are less likely to be coordinated with neighboring areas than they may be in other market constructs. ***For these reasons, a real-time market is scored as "fair."***

Day-Ahead: The day-ahead market construct is expected to further unlock the capabilities of existing generation and increase generation optimization with generation bidding opportunities existing in both the real-time and day-ahead time horizons. However, the ability to unlock generation potential will be limited to that which is bid into the voluntary market and the generation fleet can only be optimized on the amount of transmission which is made available to the market. Furthermore, it is assumed that some transactions will take place outside the market and, thus, not all generation will be optimized via SCED in a day-ahead market construct. In the day ahead market construct, the market may optimize ancillary services, reducing the reserve needs for individual BAs. A day-ahead market can also offer the ability to decrease future generation investments, via capturing load diversity benefits, but the extent to which generation investments can be reduced is highly dependent on the specifics of market design.[32] In this type of a market, it is still less likely than under an RTO that new generation investment will be coordinated across a large area. But it is possible there may be somewhat more coordination of new generation investments than in a bilateral or real-time market construct, as the potential for reduced wheeling costs should incent the siting of generation investments in more efficient areas. ***Thus, a day-ahead market is ranked as "good" as it is an improvement over real-time in achieving this metric but is unlikely to be as effective as an RTO in reducing the need for new generation investments.***

RTO: RTOs are generally excellent at optimizing and unlocking the full potential of the generation that is bid into the market. That said, experience has shown that some resources will self-schedule in an RTO and, therefore, their full potential (and/or the lowest cost generation solution) may not be unlocked. An RTO is assumed to have access to the full transmission system for optimization, which increases the ability to unlock generation potential under this market construct. An RTO can reduce the need for new generation resources to be built (i.e., reducing generation investment) by allowing for resource and load

[31] In the companion, Technical Report associated with this study, the real-time market construct was evaluated as having 0-10% of the capacity cost savings potential that might be available under an RTO.
[32] Thus, the day-ahead market construct was evaluated as having 0-50% capacity cost savings of an RTO in the Technical Report.

diversity to be shared across the footprint. Securing these savings is more likely in an RTO than in other market constructs given the shared Resource Adequacy frameworks of an RTO.[33] ***An RTO is ranked as "very good" for unlocking existing generation and reducing future generation investment costs. An excellent ranking was not provided given that self-scheduling can prevent full optimization of the generation fleet.***

Ability to unlock full potential of existing transmission system (lowering costs) and to decrease transmission capital costs/investments

Ability of Market Construct to Support Reliable, Affordable Provision of Energy to Consumers	Bilateral	Real-Time	Day-Ahead	RTO
Ability to unlock full potential of existing transmission system (lowering costs) and to decrease transmission capital costs/investments	*Fair*	*Good*	*Very Good*	*Excellent*

This metric is similar to the prior metric but is focused on the transmission system. It evaluates how market constructs can both unlock the full potential of the existing transmission system and also decrease transmission capital costs/investments that may be necessary to provide reliable electric service. Efficient use of the existing transmission system can provide both affordability and reliability benefits. Decreasing the need for future transmission investments (or decreasing their costs) can support the more affordable provision of energy to consumers. Additionally, transmission planning over a larger footprint, and with more competitive bidding of transmission projects can help reduce the total cost of transmission that consumers will bear. Market constructs that provide for efficient use of the existing transmission system, provide opportunities to reduce the need for investments in the transmission system, and provide avenues to reduce costs when transmission investments are necessary will rank well under this metric.

Bilateral: In the bilateral construct, transmission system capacity may go unused due to both wheeling costs and the contract path methodology preventing full use of the existing transmission system. However, in the West, real-time, operational use of the transmission system (including under a bilateral market) may be allowed up to reliability limits under the new paradigm for Path Operations, which enhances how this market construct can unlock the full capabilities of the existing transmission

[33] The Technical Report assumed RTOs could capture 100% of the calculated load diversity benefits that could be realized through planning sufficient to meet a coincident peak as compared to planning to meet a non-coincident peak.

system.[34] Despite increased operational efficiencies under a bilateral market construct, the contract path methodology used to determine availability of longer term uses/sales on the existing transmission system in a bilateral is inefficient for those longer term uses. Therefore, the bilateral market has the potential to necessitate additional investments in the transmission system when contract paths that are desired for contractual use become constrained. When investments in new transmission are needed under a bilateral market, they may be less efficient than under other market constructs, as they are less likely to be coordinated with neighboring areas and unlikely to be subject to competitive bidding requirements.[35] ***Thus, a bilateral market is ranked as "fair" for this metric.***

Real-Time: A real-time market is similar to bilateral for this metric but has the potential to use the existing transmission system more efficiently and to reduce the need for new transmission investments. A real-time energy market can increase efficient use of the existing transmission system, but only for transactions that occur within the real-time market. Nevertheless, this might help reduce congestion on the system and could, theoretically, defer the need to invest in additional transmission infrastructure. As in the bilateral construct, when investments in new transmission are needed they may be less efficient as they are less likely to be coordinated with neighboring areas and they continue to be less likely to be subject to competitive bidding requirements. ***A real-time market is ranked as "good."***

Day-Ahead: In a day-ahead market construct, the use of the existing transmission system and the impact on future transmission investments are highly dependent on market design. For instance, the market design will likely determine to what extent the market incorporates financial transmission rights to increase the efficient use of the existing transmission system. Regardless of ultimate market design, it is reasonable to expect some use of the contract path methodology for transmission availability/sales (or holding back of certain amounts of transmission for bilateral uses) will continue in a day-ahead market. This would serve to limit efficient long-term use of the transmission system as compared to a market where all transmission capacity is available to for use in the market optimization. Under a day-ahead market, joint transmission planning across the footprint is not assumed. Thus, new transmission is still unlikely to be fully coordinated across the footprint of a day-ahead market and new transmission investment remains less likely to be subject to competitive bidding requirements (similar to a bilateral or real-time market). ***A day-ahead market is ranked as "very good" as it is a significant improvement over a real-time market but is unlikely to unlock the most efficient use of the transmission system nor to reduce future transmission investment needs in the same manner as an RTO, which includes coordinated transmission planning and, more frequently, results in competitive bidding for large transmission projects.***

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[34] See the following for more information on the "New Paradigm for Path Operations":
WECC: New Paradigm for Path Operations Report

[35] Though FERC Order 1000 regional and interregional transmission planning activities occur in bilateral markets, to date, they have not demonstrated an ability to drive coordinated transmission investments across the West nor, outside of the CAISO, to facilitate competitive bidding of transmission investments.

RTO: Financial transmission rights, elimination of rate pancaking/wheeling costs, and the use of SCED in an RTO generally lead to efficient use of the full capabilities of the existing transmission system up to reliability limits. This efficient use of the transmission system generally results in a reduced need for new transmission projects and investments compared to other methods market constructs. Furthermore, future investments may be more efficient with transmission jointly planned by the independent RTO, with more frequent competitive solicitations utilized to reduce transmission investment costs. Though this metric is focused on unlocking existing potential and decreasing capital investments, it is worth noting that, under an RTO, cost allocation of new transmission investments, and allocation of existing transmission costs across the footprint, may benefit or harm individual states or entities depending on its design. Transmission cost allocation issues should be evaluated by states within RTO market design effort and should take into account specific circumstances. ***An RTO is ranked as "excellent" at achieving this metric, but special consideration should be paid to addressing and evaluating transmission cost shifts and transmission cost allocation under this market construct.***

General ability to support reliable operations

Ability of Market Construct to Support Reliable, Affordable Provision of Energy to Consumers	Bilateral	Real-Time	Day-Ahead	RTO
General ability to support reliable operations	*Good*	*Very Good*	*Very Good*	*Excellent*

Market constructs, and the associated tools utilized in those market constructs, can be valuable in supporting reliability of the electric system. A number of analyses have been performed to evaluate how markets can contribute to reliable operations. Several assessments were reviewed for this project and were relied upon to rank how market constructs contribute to this metric. Readers interested in additional details on reliability benefits of markets are encouraged to review the following materials, in addition to many others that may be available, as the detailed findings from other assessments will not be repeated here:

- Qualitative Assessment of Potential Reliability Benefits from a Western Energy Imbalance Market; *Federal Energy Regulatory Commission staff paper;* February 26, 2013.
- Reliability Implications of Expanding the EIM to Include a Day-Ahead Market Services: A Qualitative Assessment; *WECC MIC MEA Working Group;* September 2020.

Bilateral: Bilateral markets can, and do, achieve reliable operations, though, reliability may become more challenging under this construct in the future as the resource mix evolves and the need to share variability across a large footprint increases. Bilateral markets generally lack a SCED to manage

generation and energy flows and instead utilize a number of more manual processes. Overall, in a bilateral market there is relatively little automation of processes, including in responding to system contingencies. The addition of automated tools and consolidated operational responsibilities may improve reliability or deliver reliable operations at a lower cost in a bilateral market. During system events, in a bilateral market resources are dispatched manually; moreover, their ability to serve load may be limited by the availability of transmission reservations and could be hampered by the lack of centralized information on generation availability. In a bilateral market construct, multiple parties have operational/reliability responsibilities within a relatively small geographic footprint, and imbalances and resource integration take place on the individual BA level (though trades can take place to facilitate these needs, they are less coordinated). ***A bilateral market can offer good reliable operations but there is room for improvement. Thus, a bilateral market is ranked as "good."***

Real-Time: A real-time market provides additional situational awareness and new information on generation availability/ dispatch across a wider footprint, both of which can support reliability. The addition of a real-time SCED enhances reliability by managing generation in a manner that can help alleviate transmission constraints and, under this market construct, generation is more likely to be able to be dispatched to take advantage of physical transmission capability as compared to bilateral markets that require securing a transmission reservation. Increased automation of processes may also take place in a real-time construct (though some processes are likely to remain less automated). For example, SCED can automate the resolution of imbalances and support resource integration over a larger footprint. Additionally, while multiple parties retain operational responsibility under this market construct, there tends to be greater coordination through the market operator, enhancing reliability. ***Given the reliability benefits offered by a real-time market, it is ranked as "very good."***

Day-Ahead: Additional information on generation availability and dispatch in a day-ahead market construct can be useful in supporting reliable operations. Furthermore, moving to a day-ahead market may provide opportunities for increased automation of processes and the addition of shared tools across the market footprint. For example, the use of SCED for day-ahead unit commitment enhances reliability by managing generation and helping relieve transmission constraints in advance of real-time operations, leaving the grid better positioned/set-up for reliable outcomes in real-time operations. Similar to the real-time market multiple parties still retain operational responsibility, but there is greater coordination through the market operator, enhancing reliability. ***Like a real-time market, a day-ahead market is ranked as "very good" at supporting reliable operations, though, it does offer some enhanced benefits over a real-time market.***

RTO: An RTO offers very similar overall reliability benefits to a day-ahead market but may include a few additional reliability-based benefits. For example, it is generally expected that, under an RTO, more generation will be offered into the market, which may help the system be better positioned to achieve reliable outcomes than when not all of the generation on the system is participating in the market, as may be more likely in a day-ahead market. An RTO also consolidates operational responsibilities compared to the other market constructs, which may enhance reliability. An RTO includes BA consolidation, which likely provides the best ability to resolve imbalances, increase automation, meet

reserve requirements, and support resource integration over larger footprint. ***Thus, an RTO is ranked as "excellent" at supporting reliable operations, though it is recognized that RTOs are not immune from reliability challenges.***

Visibility into electric system conditions to improve reliability

Ability of Market Construct to Support Reliable, Affordable Provision of Energy to Consumers	**Bilateral**	**Real-Time**	**Day-Ahead**	**RTO**
Visibility into electric system conditions to improve reliability	*Fair*	*Good*	*Very Good*	*Excellent*

In addition to a general ability to support reliable operations, market constructs can provide enhanced visibility into electric system conditions which can help facilitate reliable outcomes. This section evaluates the ability of market constructs to provide enhanced visibility into system operations to support reliability. Visibility to operators is most important to improving reliability, and will be the key focus of the rankings under this metric, but there may be tangential benefits to providing some level of visibility to non-operators. Thus, both audiences are considered under this metric, but the primary focus is on ensuring a wide and complete view of system conditions to system operators.

Bilateral: Visibility into system conditions can be somewhat limited in a bilateral market, which has the potential to hinder reliable operations in some instances. Under this market construct, the Reliability Coordinator will likely have the most visibility into system conditions across a wide area. Individual BAs and transmission providers may have, somewhat limited, visibility for generation resources and transmission systems beyond their service areas. For non-operators, there is generally little visibility into system conditions and what information is available can be inconsistent and difficult to locate. ***Thus, bilateral markets are ranked as "fair."***

Real-Time: A real-time market can enhance visibility into system conditions and increase situational awareness with the addition of a market operator along with SCED and other tools. The Reliability Coordinator continues to have the widest area view, just as in a bilateral market, but under a real-time market there is increased visibility to the market operator. The addition of the real-time market, and its associated rules, provide the market operator with more insights into transmission availability and increased information on generator operations and availability. Non-operators are also expected to have increased visibility through disclosure of additional information by the market operator, though the market operator may only report on a subset of information on system conditions relative to more expanded market constructs. ***A real-time market is ranked as "good."***

Day-Ahead: A day-ahead market further enhances visibility into system conditions, including enhancing the visibility of expected system conditions on a day-ahead basis. Under a day-ahead market, there is expected to be increased visibility of generator information and other transmission-related data to the market operator (and potentially to some other participants as well). The ability to review generator and transmission information on a day-ahead basis can enhance reliability by providing operational entities with additional time to react to potential reliability risks. Non-operators are also expected to get increased visibility of system conditions through disclosure of additional information by the market operator. ***Therefore, a day-ahead market is ranked as "very good" in providing enhanced visibility into system conditions.***

RTO: An RTO generally offers substantial visibility into system conditions for market operators, given the associated requirements of the market, and RTOs can provide increased situational awareness. Under an RTO, the Reliability Coordinator function continues to have a wide area view. An RTO includes the consolidation of BAs, which leads to more centralized operational and reliability responsibilities, which may improve overall visibility to the market operator across the system. Also, the addition of a mid-term reliability construct (e.g., resource adequacy requirements or capacity market) may serve to increase visibility into reliable operations in the longer term. In an RTO, non-operators are expected to get increased visibility of system conditions through the disclosure of additional information by the market operator. ***Thus, an RTO is ranked as "excellent."***

Transparent and timely information available to regulators, consumer advocates and other stakeholders

Ability of Market Construct to Support Reliable, Affordable Provision of Energy to Consumers	Bilateral	Real-Time	Day-Ahead	RTO
Transparent and timely information available to state PUCs consumer advocates and other stakeholders	*Fair*	*Good*	*Very Good*	*Excellent*

In order to provide reliable, affordable provision of energy, it is important that parties tasked with protecting customers have access to transparent and timely information to support their efforts. State PUCs and consumer advocates can be more effective in ensuring affordability and reliability for consumers if they have transparent and timely access to information. This section evaluates how different market constructs contribute to providing timely and transparent information on system operation, market prices, and more.

Bilateral: Bilateral markets generally do not provide a large degree of transparent and timely information to key stakeholders. For instance, bilateral market prices generally are only reported at

limited locations (such as trading hubs) with aggregated and averaged trading information reported. Thus, there is a limited ability for regulators, consumer advocates and stakeholders to access bilateral trade data and it may not be provided in the most timely manner. Of course, information on bilateral trades can be requested via regulatory processes for regulated utilities, but is unlikely to be provided in a timely manner via those processes. In a bilateral market, resource and transmission related information typically comes not as a result of the market construct but due to other reporting requirements (e.g., EIA and Western Electricity Coordinating Council). Additionally, it can be difficult to obtain information on transmission flows and utilization within a bilateral market. ***Thus, a bilateral market is ranked as "fair" in providing timely and transparent information to key stakeholders.***

Real-Time: In addition to the information available in bilateral markets, more granular and timely information on real-time prices at a variety of locations is provided under a real-time market structure. Some resource operations and transmission flows information may be provided by the market operators, but significant amounts of information on resource operations and transmission will likely continue to come from other (non-market) sources, as is true in a bilateral market. ***A real-time market is ranked as "good."***

Day-Ahead: A day-ahead market would likely provide timely access to day-ahead and real-time prices at more locations (as more generation resources are expected to actively bid into a day-ahead market than might participate in a real-time market). A day-ahead market may also provide additional, timely information on resource operations to key stakeholders. Generally, it is expected that a day-ahead market would provide more transparency into transmission flows and utilization than a bilateral or real-time market. ***Thus, a day-ahead market is ranked as "very good."***

RTO: Given that an RTO would generally require resource participation in the market, there would likely be additional pricing transparency into more locations and additional information on resource operations than in a day-ahead market. Additionally, it is expected that information on transmission flows and utilization would be available to PUCs, consumer advocates and other stakeholders on a timely basis, as is generally seen in other RTOs. RTOs also have other reporting requirements, such as those imposed by Order 844. ***Therefore, an RTO is ranked as "excellent" In achieving this metric.***

Long-term mechanisms to support a system with adequate electric resources

Ability of Market Construct to Support Reliable, Affordable Provision of Energy to Consumers	Bilateral	Real-Time	Day-Ahead	RTO
Long-term mechanisms to support a system with adequate electric resources	*Fair*	*Good*	*Good*	*Very Good*

This metric is focused on whether market constructs provide mechanisms that can support reliability in the longer-term. For instance, a market construct that includes resource adequacy measures that extend out one year or more may help support longer-term reliable operations by providing insights into potential reliability concerns and a window of time to address them. There are different mechanisms to support reliable operations in the longer-term that can be implemented under these various market constructs. The benefits of adequate resources across a larger footprint are also considered in these rankings.

While the market constructs evaluated as part of this project may provide longer-term mechanisms to support adequate resources, it should be noted that non-market mechanisms may be separately developed to achieve this metric. For instance, the Northwest Power Pool (NWPP) is currently developing a Resource Adequacy Program. That program may be able to be implemented in a bilateral, real-time, or day-ahead market construct and the addition of such a program could increase the rankings for those market constructs.

Bilateral: Within a bilateral market, mechanisms to support long-term resource adequacy are generally facilitated through individual utility resource plans and the requirements can vary. Long-term adequacy is met by utilities relying on their own generation, generation purchased through PPAs, and through bilateral market purchases (sometimes referred to as "front office transactions"). Generally, there are no overarching long-term reliability requirements on a systemwide basis nor is there a regional entity responsible for overseeing the ability of the larger system, as a whole, to achieve resource adequacy.[36] Absent regional coordination on resource adequacy, there is a potential for load serving entities to rely on the same underlying resources in order to meet their future needs, which could present a reliability challenge. The potential for exposure to high market prices in a bilateral market during tight system conditions can serve as an incentive for load serving entities to develop adequate resources to meet their longer-term needs. ***A bilateral market is ranked as "fair" though this ranking could be increased with the addition of a regional resource adequacy program to a bilateral market.***

Real-Time: Long-term resource adequacy in a real-time market construct is expected to be handled in the same manner as it is a bilateral market. However, mechanisms to ensure sufficiency in the real-time market may provide additional incentives to ensure longer-term adequacy, as market participants may seek to avoid any penalties (financial or otherwise) that would be applied for failing resource sufficiency requirements. As in a bilateral market, there is potential for high real-time prices to provide incentives for entities to ensure they have adequate supplies in the longer-term. ***Thus, a real-time market is***

[36] As noted above, some entities are working through the NWPP to develop a voluntary, regional program to address regional resource adequacy. This program is not yet fully implemented but is in development. Its addition to the bilateral, real-time, or day-ahead construct would likely increase the rankings of those market constructs under this metric.

ranked slightly above a bilateral market as "good." A real-time market's ranking on this metric would increase with the addition of a regional resource adequacy program.

Day-Ahead: Long-term adequacy in a day-ahead market construct is expected to be handled in the same manner as it is a bilateral or real-time market. Like a real-time market, there is a potential for market rules around resource sufficiency to provide additional incentives to ensure longer-term adequacy. And the potential for high prices, and the impacts of failing the market's resource sufficiency test, may also provide incentives for maintaining adequate supplies in the longer-term. ***A day-ahead market is ranked the same as a real-time market with a "good" ranking. As with a bilateral or real-time market, a day-ahead market's ranking on this metric would increase with the addition of a regional resource adequacy program.***

RTO: RTOs generally include a systemwide resource adequacy metric/planning reserve margin to support mid- to long-term reliability objectives. Depending on market design, an RTO may have capacity market or other backstop procurement authority to support longer-term resource adequacy. However, reliability issues have persisted in RTOs and there are challenges associated with various mechanisms used to support longer-term adequacy in RTOs. ***Given the improvement over real-time and day-ahead markets and the recognition of reliability issues persisting in some RTOs despite longer-term programs, an RTO is ranked as "very good" in providing long-term mechanisms to support system adequacy.***

Increased opportunities for cost-effective demand-side resource participation

Ability of Market Construct to Support Reliable, Affordable Provision of Energy to Consumers	Bilateral	Real-Time	Day-Ahead	RTO
Increased opportunities for cost-effective demand-side resource participation	*Fair*	*Good*	*Very Good*	*Excellent*

Providing opportunities for cost-effective demand-side resource participation in the markets can support both reliability and affordability to consumers. Demand-side resource participation in markets can reduce the load that must be served during stressed system conditions, increasing reliability. A high-profile example of this is the reductions in load that were achieved in the CAISO footprint during the summer 2020 heatwave. In the midst of these 2020 events, there were concerns that there may be a resource deficiency of up to 4,400 MW on August 17th and 18th; however, a statewide mitigation effort

and consumer conservation prevented the need for any rotating outages on those days.[37, 38] Demand-side resources can also prevent the need to build additional generation facilities and can, therefore, serve to promote affordability for consumers. This section evaluates how each market construct can support increased opportunities for cost-effective demand-side resources.

Bilateral: In a bilateral market, there may be some opportunities for demand-side resource participation. For instance, utilities may enter into interruptible load agreements with utility providers. Utilities may also offer a variety of programs to help shift load, such as Rocky Mountain Power's Cool Keeper program. But, these types of opportunities for demand-side resource participation are generally not widely available to all demand-side resource types or across all areas. Additionally, in order for a utility to obtain state PUC approval for a demand-side resource program in a bilateral market, the proposal may need to rely on historical events and prices to justify the program's cost-effectiveness; however, an evaluation based primarily on historical data may not fully capture the program's value during high price periods if those periods are not sufficiently reflected in the historical data. ***A bilateral market is, therefore, ranked as "fair."***

Real-Time: A real-time market construct can generally accommodate demand-side resource participation, but whether such participation options are enabled will generally depend on market design and the decisions of individual participants. For instance, at least one EIM Entity that participate in the CAISO's Western EIM enables load, curtailable demand and other demand-side resource services to become EIM Participating Resources and bid into the market. However, many others do not allow this type of participation. ***Thus, a real-time market may increase some opportunities for cost-effective use of demand-side resources but the extent to which that occurs will depend on market design and, therefore, real-time market is ranked as "good."***

Day-Ahead: A day-ahead market construct can generally accommodate demand-side resource participation within the market, but similar to the real-time construct, whether it is enabled will likely depend on market design and individual participant decisions. As a day-ahead market is likely subject to increased FERC oversight, it is more likely to have requirements associated with demand-response participation across all participants than a real-time market might have. ***Thus, while exact opportunities will depend on market design, a day-ahead market is expected to increase opportunities for demand-side resource participation over a real-time market, and is, therefore, ranked as "very good."***

RTO: Several FERC Orders are aimed at ensuring demand-side resources can participate in an RTO (including Order 719, 745, 841, and 2222 for distributed energy resources). Issued in 2008, Order 719 opened organized wholesale markets to the participation of demand response resources, allowing large industrial customers to be compensated at wholesale rates. A subsequent order, Order 745, allowed demand response resources to participate in both energy and ancillary service markets, and in 2011,

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[37] CAISO: Briefing on System Operations Presentation
[38] CAISO: Final Root Cause Analysis Mid-August 2020 Extreme Heat Wave

FERC issued Order 841, opening organized wholesale markets to storage resources.[39] Following up on Order 841, Order 2222 expanded opportunities for distributed energy resources to participate alongside traditional resources in wholesale markets by allowing distributed energy resources to aggregate to satisfy minimum size and performance requirements that they might not meet individually.[40] ***Given the opportunities provided for demand-side resources in an RTO, it ranked as "excellent."***

Summary Scorecard for Reliable, Affordable Provision of Energy to Consumers

In conclusion, this scorecard assesses how the four market constructs may help contribute to the *Reliable, Affordable Provision of Energy to Consumers*. Similar to the *Increased Use of Clean Energy Technologies* scorecard, moving toward more centrally optimized markets generally increases the scores across the individual metrics – but again, achieving those potential benefits in practice will depend on the details of an individual market's design. An RTO appears best situated to achieve the various metrics that contribute to *Reliable, Affordable Provision of Energy to Consumers*. However, the RTO construct was not "excellent" at achieving every metric within this scorecard. Given the potential for generation to self-schedule in an RTO and the continued challenges with long-term mechanisms for achieving adequate resources, the RTO construct was ranked as "very good" at supporting two metrics that address those issues within this scorecard.

[39] S&P Global Market Intelligence: FERC clarifies order on distributed energy, launches demand response inquiry
[40] FERC News Release: FERC Addresses Demand Response Opt-Out for Certain DER Aggregations

Summary Market Factor Scorecard for Reliable, Affordable Provision of Energy to Consumers

Ability of Market Construct to Support Reliable, Affordable Provision of Energy to Consumers	Bilateral	Real-Time	Day-Ahead	RTO
Efficient grid operation which reduces costs and increases flexibility of transactions	*Fair*	*Good*	*Very Good*	*Excellent*
Ability to unlock full potential of existing generation (lowering costs) and to decrease generation capital costs/investments	*Poor*	*Fair*	*Good*	*Very Good*
Ability to unlock full potential of existing transmission system (lowering costs) and to decrease transmission capital costs/investments	*Fair*	*Good*	*Very Good*	*Excellent*
General ability to support reliable operations	*Good*	*Very Good*	*Very Good*	*Excellent*
Visibility into electric system conditions to improve reliability	*Fair*	*Good*	*Very Good*	*Excellent*
Transparent and timely information available to state PUCs, consumer advocates and other stakeholders	*Fair*	*Good*	*Very Good*	*Excellent*
Long-term mechanisms to support a system with adequate electric resources	*Fair*	*Good*	*Good*	*Very Good*
Increased opportunities for cost-effective demand-side resource participation	*Fair*	*Good*	*Very Good*	*Excellent*

7. Retain State Regulatory Authority on Key Jurisdictional Elements Market Factor Scorecard

In addition to scorecards evaluating how market constructs would contribute to meeting Western states' two overarching goals—increased clean energy technology use and providing affordable and reliable energy to consumers—stakeholders requested an evaluation of how market constructs might impact key elements of state jurisdiction. While not an overarching state policy goal, the ability to retain state authority on certain elements is a crucial piece of market expansion discussions, and as such, is addressed in this section. There is inherent difficulty in ranking the impacts to state authority, while broadly considering the range of potential market designs that might arise from any of the market constructs. Thus, the assessment of state authority issues was not originally envisioned as a "scorecard" and was originally proposed to take the form of a written summary. However, the *Retain State Authority on Key Jurisdictional Elements* scorecard was created as a result of stakeholder feedback indicating that having this assessment provided in the market factor scorecard format would enhance ease of review for state participants and stakeholders.

It is important to caution that the rankings in this scorecard on state authority are *not* based on an in-depth review of federal and state statutes and administrative codes across the West. Each state (and specifics of an individual market formation) will invariably have unique circumstances, rules, and regulations. And an in-depth review of state-by-state nuances was outside of the scope of the Market and Regulatory Review's Work Plan. Furthermore, in any scenario, the retention of state authority is a highly nuanced issue, which depends on the position of individual states and utilities and, perhaps most importantly, the specifics of a market's design. These nuances cannot be fully captured in the simplified format of the scorecard that is intended to provide generalized information and is not evaluating a specific market proposal's impact on a specific utility and state. As such, the *Retain State Regulatory Authority on Key Jurisdictional Elements* scorecard includes several "ranges" of rankings in order to help reflect the nuance, uncertainty, and diversity of potential outcomes associated with retention of state authority and market development.

These ranges of state authority apply not only to various degrees of organized wholesale markets, but also to a bilateral market framework. As the Lead Team noted during meetings over the course of the project, even under a bilateral market, states may not have as much practical authority over certain elements of electric utilities' business actions as state statutes would suggest. It has been noted that, even in a bilateral market construct, the interconnected nature of the electric system as well as the fact that some utilities serve load in multiple states and/or partner with other utilities on power projects can, in practice, serve to limit the authority a state has over regulated electric utilities under the state's jurisdiction. For instance, states that regulate PacifiCorp effectively share certain elements of their authority with other states and must coordinate and work with those other states through the Multi-State Process (MSP).

Finally, when reviewing the ranking for the metrics in the *Retain State Authority on Key Jurisdictional Elements* scorecard, it should be noted that the rankings are intended to capture *practical implications*

of market formation on the authority of a single state, rather than to exclusively focus on the potential legal implications or changes to a state's authority. For instance, from a legal perspective, states generally do not give up any authority over ratemaking activities due to a utility electing to participate in any of these forms of wholesale markets. However, from a practical perspective, there may be some change in a state's ability to fully exert its authority, with fewer inputs and assumptions that can be easily challenged in a ratemaking process. At the request of the Lead Team, these scorecards are intended to capture not just the strictly legal implications of market formation, but also the practical implications and their effect on a state's authority.

Special Considerations and Best Practices

In addition to the *Retain State Authority on Key Jurisdictional Elements* taking the form of a scorecard, stakeholder feedback also requested the inclusion of "best practices" for states as they engage in discussions around the development of various market constructs. While not an exhaustive or detailed list, this section reviews historical examples of state engagement in organized market development that may provide insight into potential best practices and special considerations for states as they contemplate future market proposals.

Specifically, the Lead Team identified the following areas as important for state engagement, particularly around RTO formation, each of which is discussed in more detail below.

- Informed engagement by a State Commission in the planning, decisions, and governance of an organized market
- Careful state PUC consideration of conditions of approval requests by jurisdictional utilities to join an organized market
- Comprehensive review of the impacts of proposals to unbundle state PUC regulated rates

Informed engagement by a State Commission in the planning, decisions, and governance of an organized market

Informed engagement by a State Commission in the planning, decisions, and governance of organized markets was identified as an overarching best practice for states, which can help states retain stronger authority over many elements of jurisdiction that may be important in achieving their energy policy objectives. At the outset of market expansion proposals, states often have the opportunity to participate in market design and development processes.[41] Such early engagement by states can help shape the ultimate design, benefits, and, importantly, influence the ongoing role for states within a market construct. State participation in market proposal development can help promote the inclusion of

[41] In addition to participating in these processes, when an RTO is being contemplated, state PUCs will also generally have an opportunity to consider applications for a utility to join the RTO. And, as discussed more in the following subsections, states can utilize that approval process to help ensure some of these best practices are implemented by the RTO.

provisions that preserve state authority over matters presently regulated by the states and potentially build out a special role for states in RTO governance. In some markets, relatively robust ongoing state engagement has been facilitated through regional state committees.

For example, SPP's Regional State Committee (RSC) is composed of regulatory commissioners from participating states. SPP's bylaws confer certain authorities and responsibilities within the governance of SPP to the RSC, including specific authority over transmission cost allocation, financial transmission rights, planning for remote resources, and regional resource adequacy.[42, 43]

When the RSC reaches a decision on the areas under its authority, SPP will file the methodology with FERC pursuant to Section 205 of the Federal Power Act. [44] However, SPP is not prohibited from filing its own related proposal(s) on these issues. Thus, within SPP the RSC is referred to as having "Section 205 filing rights" for transmission cost allocation and resource adequacy proposals.

Additionally, Section 7.3 of the SPP bylaws makes clear that nothing in the formation of SPP as an RTO is intended to diminish jurisdiction or authority of any other regulatory body, and any regulatory agency with utility rates or services jurisdiction over a member of the RTO reserves the right to exercise all lawful means available to protect its existing jurisdiction and authority.[45]

Another example of an RTO with a regional state committee that provides meaningful opportunity for state engagement in an RTO is MISO, with its Organization of MISO States (OMS). OMS was established to represent the interests of state and local utility regulators in the MISO territory. The OMS consists of 17 members across 15 states and the Canadian province of Manitoba. The organizational structure of the OMS is composed of an executive director, staff, and a board made up of a commissioner from each member state. Additionally, MISO's bylaws allow for "associate membership," which is open to state agencies covering issues related to energy planning, environmental issues, and consumer advocacy.[46]

As part of the agreement for Entergy to join MISO (discussed below and in Appendix 1), the OMS was granted Section 205 filing rights complementary to those held by RTOs and transmission owners. As such, if 66% of OMS' voting members concur, the OMS can request that MISO file an "OMS Alternative"

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[42] SPP: History of the Regional State Committee for SPP, 2021
[43] SPP: Bylaws See Section 7.2.
[44] Section 205 of the Federal Power Act tasks FERC with ensuring that rates for transmission and electricity under its jurisdiction are "just and reasonable and not unduly preferential." A mechanism FERC utilizes to fulfill this responsibility is requiring certain entities that it regulates to submit a filing requesting FERC's approval for proposed rates. The ability to submit such a filing with FERC is known as "Section 205 filing rights." Transmission owners and regional grid operators typically hold Section 205 filing rights, and as illustrated by the examples in the body of this text, some regional state committees in organized markets have acquired complementary Section 205 filing rights for certain discrete elements. Please see FERC 101 and NRDC Issue Brief: Making Sense of Potential Western ISO Governance Structures: The Role of States.
[45] SPP: Bylaws, First Revised Volume No. 4
[46] MISO: Bylaws

proposal with FERC. That said, MISO is not required to make the filing. Should MISO not file the OMS Alternative, the OMS may intervene in the FERC proceeding. The transmission owners' agreement makes clear that no aspect of OMS' complementary filing rights diminishes the Section 205 filing rights of MISO or its member owners. However, some contend that the existence of enhanced influence for OMS has proved effective at influencing outcomes in MISO processes related to cost allocation.[47]

MISO's tariff provisions also provide states with significant retained authority over resource adequacy. Recently, there have been ongoing discussions in MISO to understand and clarify the relevant tariff provisions related to states setting their own resource adequacy requirements for utilities under a state's jurisdiction. In sum, within MISO state authorities can set planning reserve margins (but not local reliability requirements or local clearing requirements). States can designate which entities are subject to their jurisdiction, and MISO would incorporate the state-set planning reserve margin into the jurisdictional load-serving entity's planning resource margin requirements. Notably, under the current tariff provisions, states could set not only a higher reserve margin than the MISO standard, but *may also set a lower reserve margin*, thereby, providing significant discretion to individual states on resource adequacy matters within MISO. [48]

As illustrated by the examples above, regional state committees, particularly when coupled with complementary Section 205 filing rights, can be an effective avenue to enhance states' influence in an RTO. State engagement in the development or modification of RTO tariff provisions can also provide individual states with significant authority, such as the authority provided to individual states on resource adequacy within MISO, even if those areas of authority are not directly included in the regional states committee's scope. As states contemplate the inclusion of a regional states committee within a potential RTO construct, they may also wish to explore options and implications around the committee's membership eligibility, voting rights, funding structures, and the committee's organizational structure to ensure the committee best serves the needs of the states. And, on a going forward basis, states should actively engage in a regional states committee to best support retention of state authority.[49, 50]

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[47] NRDC Issue Brief: Making Sense of Potential Western ISO Governance Structures: The Role of States
[48] MISO: Tariff Provisions Pertaining to State Authorities Establishing Requirements
[49] There are other "best practices" not specifically covered here to provide states with resources to assist in continuing informed engagement in a regional states committee. While some of the funding/structure for these additional resources may come from with the construct of the market, it is likely that others may need to come from the state itself.
[50] Beyond regional state committees with Section 205 filing rights, opportunities for state influence in RTOs can also be possible through intervening in proceedings at FERC in support of, or in opposition to, a filing. Furthermore, states can also influence market decisions through engaging in general stakeholder initiatives and participating in various committees or working groups within an RTO. For example, there is an Independent State Agencies Committee (ISAC) in PJM, which is a voluntary, stand-alone committee that consists of members from regulatory and other state agencies from within PJM's service territory. The ISAC is an independent committee that is not controlled or directed by PJM, the PJM Board of Managers or PJM members. The purpose of the ISAC is

Careful state PUC consideration of conditions of approval requests by jurisdictional utilities to join an organized market

As market expansion proposals materialize, a crucial point for states to exert influence is in the careful state PUC consideration of conditions for approval in response to requests from jurisdictional utilities to join an organized market. In general, it is the practice of a utility turning over operational/functional control of transmission to a market operator which will trigger the greatest degree of state regulatory involvement in market participation decisions.[51] This implies that states are likely to have a relatively higher degree of engagement in the approval processes when a utility is seeking to join an RTO as opposed to a market formation in which operational/functional control of transmission facilities is retained by the utility, as is assumed to be the case for both real-time and day-ahead market constructs. States can utilize the approval process for modifications to operational control to place conditions upon which a utility may join or continue participation in a market.

These conditions have been used in the past to help secure or enhance the role of states within an organized market. For example, in order to join MISO, Entergy was required to file an application, for approval to transfer operational control of its transmission assets to the MISO RTO, in each state where it delivered electricity to customers: Arkansas,[52] Louisiana,[53] Mississippi,[54] and Texas.[55] All four state commissions gave their approval subject to conditions, including conditions around expanding or retaining the role of the states within the MISO construct. Therefore, it was through the state PUC approval process for Entergy to join MISO that the states were able to increase their involvement in key market design elements of the MISO RTO. A small subset of the conditions set in the states' orders include:

- State PUCs orders indicated that Entergy needed state PUC approval to exit MISO, and that the relevant state PUCs could also direct Entergy to exit MISO.
- The Arkansas PUC ordered that the OMS must have "legally recognized responsibility" for determining regional proposals regarding transmission planning and cost allocation and directing MISO to construct transmission upgrades and choosing the approach to be utilized for assessing resource adequacy.
- The Arkansas and Texas PUCs ordered that the Entergy Regional State Committee (a multi-state committee in existence prior to Entergy's proposed entrance into MISO) retain the same

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to provide PJM with inputs and scenarios for transmission planning studies (except public policy requirements, which are provided individually by the state). See PJM.com.

[51] As an example, please see Laws Relating to the Public Utility Commission of Oregon.

[52] Arkansas Public Utility Commission, Docket No. 10-011-U, Order No. 68

[53] Louisiana Public Service Commission, Order No. U-32148

[54] Mississippi Public Service Commission, Docket 2011-UA-376

[55] Public Utility Commission of Texas, Docket No. 40346

governance authority in MISO during the transition period (including the ability to act on transmission planning and cost allocation issues by majority vote).

- The Arkansas PUC instructed Entergy to file a detailed report, after a five-year transition period, providing historical and projected net benefits of MISO membership; any significant changes in FERC RTO policies, rules or regulations, MISO requirements, Day 2 market conditions, or other regulatory or market structure components; and an estimate of costs to exit MISO after end of the five-year transition period.

To summarize, careful state PUC consideration of potential conditions for approval of market participation proposals can help maximize ongoing state authority within market constructs and, thus, is considered a "best practice" for states wishing to retain as much regulatory authority as possible upon the implementation of new or expanded markets.

Comprehensive review of the impacts of proposals to unbundle state PUC regulated rates

The process of joining an organized market construct does not legally change the authority of state PUCs over retail electric rates. However, certain market constructs may lend themselves to utilities, or other stakeholders, seeking to unbundle certain elements of retail rates, such as unbundling the transmission component. If these unbundling proposals are implemented, they could impact state authority over retail electric rates and, thus, require careful consideration by state PUCs.

FERC has jurisdiction over unbundled costs of retail transmission in interstate commerce (and thus over wholesale transmission rates), but most states retain authority for bundled retail rates and, thus, what transmission costs are recovered in retail electric rates. This construct generally remains regardless of the market construct that is in place. It is important to note that decisions around bundled rates can have a significant effect on a state's authority over transmission cost recovery determinations, and it is a decision that can be made independent of the market construct.

States can also pre-emptively address concerns around loss of state authority over transmission rates and cost recovery by including conditions in relevant orders for utilities under their jurisdiction to join a market. The Arkansas, Louisiana, and Texas PUC orders approving Entergy's participation in MISO indicated that Entergy could not unbundle transmission or make changes to transmission service for retail ratemaking without the PUC's approval, thereby helping to preserve their respective authority over transmission costs in retail rates and retail rates themselves when Entergy joined MISO.

Undertaking a comprehensive review of the impacts of any proposals to unbundle state PUC regulated rates is an important best practice for states and can also be addressed preemptively, as was done by Arkansas, Louisiana, and Texas, to help preserve state authority over transmission costs and overall retail electric rates.

Conclusion

In sum, informed state engagement throughout the process of proposed market expansion is a best practice that can enhance states' ongoing influence and potentially improve outcomes associated with market formation. States can play a crucial role in shaping discussions around the development of market expansion proposals and in crafting an ongoing role for states through an influential regional state committee. To the extent that market proposals culminate in utilities seeking state PUC approval to join a market, PUCs have an opportunity to carefully evaluate the proposal and set forth conditions of approval for market participation, reaffirming the important role of states in potential market expansion. And states can carefully consider any proposals that may come before them to unbundle retail electric rates in a manner that may reduce state jurisdiction over these costs. Some states have even explicitly stated that transmission cannot be unbundled, and changes to transmission ratemaking, without state PUC approval. These various "best practices" can be evaluated and, where appropriate, utilized to help improve a state's market experience and the retention of state authority within a market construct.

Scorecard to Retain State Regulatory Authority on Key Jurisdictional Elements

This section outlines the metrics that were used to help assess whether a market construct is likely to allow states to *Retain Regulatory Authority on Key Jurisdictional Elements.* While retention of state authority is not an explicit state energy policy priority, retaining state authority may be important to ensure states have the tools necessary to achieve their energy policy objectives. This scorecard, more so than the prior two, is highly dependent on the specifics of individual state and utility situations as well as specifics of a market's design and thus this scorecard includes a range of rankings for each market construct.

The following sections provide additional detail and nuance around how the study arrived at the range of scores and highlights some of the potential caveats associated with the scores. As noted above, within this simplified scorecard, it is impossible to capture all the nuances of each individual state's position, the position of each regulated utility, and the specifics of a particular market's design. The use of ranges of scores is intended to help reflect some of the inherent uncertainty and different situations that may exist. Market design, including utilizing some of the best practices discussed in the preceding section, can help improve a market's relative ranking for retention of state authority. For instance, providing a strong role for states in areas of resource adequacy and transmission cost allocations, can help improve the ranking of a market construct such as an RTO.

Ability for state to retain authority over resource adequacy

Ability of Market Construct to Retain State Regulatory Authority on Key Jurisdictional Elements	Bilateral	Real-Time	Day-Ahead	RTO
Ability for state to retain authority over resource adequacy	*Good – Excellent*	*Good – Excellent*	*Good – Very Good*	*Poor – Good*
	As it exists today, the interconnected nature of the Western grid, including complexities around regulation of multi-state utilities, may limit the practical impact of state authority over resource adequacy. Market development, up to and including an RTO, can provide similar levels of "good" state authority, provided the market design includes best practices for informed engagement and authority of a Regional State Committee over resource adequacy matters. One individual state's ability to affect overall change on resource adequacy will depend on the market's governance, design and make -up.			

Outside of an RTO construct, state commissions generally have jurisdiction over resource adequacy requirements of the utilities they regulate, often via an integrated resource planning (IRP) process. Through this process, states generally determine the planning reserve margin utilities should use in their planning processes as well as the way that individual resource types and/or individual resources contribute to meeting needs. RTO constructs generally require a more coordinated set of requirements for resource adequacy, including a market wide planning reserve margin. RTOs can be designed to include strong state committees which may have varying levels of authority over resource adequacy. This metric evaluates how the role of a state on resource adequacy may change under the different market constructs.

Bilateral: In a bilateral market, state PUCs generally have jurisdiction over resource adequacy requirements of the utilities they regulate, often via an IRP process. This construct can provide the state authority over resource adequacy of utilities under their jurisdiction, which could be considered "excellent." However, for utilities that operate across multiple states, there may be practical limitations on an individual state's authority over resource adequacy. In this situation state authority may be, effectively, shared with other states. Thus, for some states in a bilateral market construct, their individual authority over resource adequacy decisions must already, in effect, be coordinated and shared with other states, which may be seen as an individual state having "good" authority over resource adequacy. Additionally, the potential for regional resource adequacy programs (such as the program under development by the NWPP) could have a practical impact on state authority over resource adequacy and could be developed under a bilateral market construct. It should also be noted that utilities that are not state regulated may have resource adequacy decisions made by their governing bodies (and not the state). ***Thus, a bilateral market may provide states with "good," "very good," or "excellent" authority over resource adequacy depending on the specifics associated with the state and its regulated utilities.***

Real-Time: There are no changes to the legal authority of states over resource adequacy through the implementation of a real-time energy market. Real-time markets may have resource sufficiency requirements which prevent real-time energy flows from being maximized in certain situations when an

entity is not self-sufficient. These rules may marginally influence state decisions around resource adequacy, but do not impact state authority over resource adequacy. Similar to the bilateral market, for utilities that operate across multiple states, there may be practical limitations on individual state authority over resource adequacy which may be, effectively, shared with other states, and regional resource adequacy programs may impact state authority. And the implementation of a regional resource adequacy program may affect a state's practical authority over resource adequacy in a real-time market construct. ***Thus, like a bilateral market, a real-time market may provide states with "good," "very good," or "excellent" authority over resource adequacy depending on the specific situation of the state and utilities operating in the state.***

Day-Ahead: Implementation of a day-ahead market is not expected to significantly change the legal authority of states over resource adequacy as compared to a bilateral or real-time market. The practical impacts to state authority over resource adequacy in a day-ahead market will depend on the design of the market. It is expected that day-ahead markets would be designed, to the extent possible, to limit their practical impact on state jurisdiction. However, a day-ahead market may have capacity and resource requirements embedded in the market design in order to prevent "leaning" within the market construct and to help ensure each participant could be self-sufficient. These types of requirements could have a marginal to meaningful impact on state resource adequacy decisions, though, they are generally not expected to impact state's legal authority over resource adequacy matters. ***Thus, a day-ahead market may provide states with "good" or "very good" authority over resource adequacy. An "excellent" ranking was not included for the day-ahead market to reflect the impact that market-wide capacity and resource requirements to transact in the market may have on states' practical authority over resource adequacy decisions.***

RTO: In an RTO, states' ability to retain authority over resource adequacy greatly depends on market design, including whether a capacity market exists or whether a regional states committee has been given a strong role on resource adequacy. Some RTOs demonstrate that, with the right governance structure, a group of states can retain significant authority over resource adequacy in an RTO (e.g., SPP and MISO); but, even under these structures, individual states must share that authority with other states that participate in the RTO through the governance of the regional states committee. Thus, an individual state may have a limited ability to influence resource adequacy decisions if they are in the minority. Other RTOs with weaker state roles and/or RTOs that include organized capacity markets have demonstrated that states can lose some control over resource adequacy within an RTO. ***Thus, depending on market design, an RTO may provide states with "poor," "fair," or "good" authority over resource adequacy. A "good" ranking is generally in line with the practices utilized in SPP and MISO and, under these constructs, states that have "good" authority over resource adequacy in the bilateral or real-time market may have similar authority in an RTO.***

Ability for state to retain authority over the resource mix of utilities it regulates

Ability of Market Construct to Retain State Regulatory Authority on Key Jurisdictional Elements	Bilateral	Real-Time	Day-Ahead	RTO
Ability for state to retain authority over the resource mix of utilities it regulates	*Good – Excellent*	*Good – Excellent*	*Good – Excellent*	*Fair – Very Good*
	As it exists today, the interconnected nature of the Western grid, including complexities around regulation of multi-state utilities and generation units with multiple owners, may serve as limitations on the practical authority states have over the resource mix of regulated utilities. Market development, up to and including an RTO, can provide similar levels of state authority over the resource mix, though market prices and market rules may impact resource mix decisions. The addition of market elements that are more likely to affect resource mix decisions (such as inclusion of a capacity market) can serve to reduce state's practical authority over the resource mix. States can improve their market experience by participating in market design and discouraging market elements that would serve to impact a state's practical authority over the resource mix.			

This metric evaluates how the role of a state in determining the resource mix may change under the different market constructs. Through state resource mix requirements, such as RPSs and clean energy standards, many Western states have exerted authority over the resource mix of electric utilities that operate within the state, in some cases whether those utilities are regulated by a state PUC or not. Additionally, state PUCs generally can exert jurisdiction over electric resource mix decisions of the utilities they regulate through a number of mechanisms including an IRP process and an ability to approve or deny cost recovery for resource investments of regulated utilities. In the case where utilities operate across multiple states, there may be practical limitations on an individual state PUC's authority over the resource mix, regardless of the market construct that utility operates within. This occurs because decisions by other states can impact the resource mix of the utility as a whole. Even when a utility operates in a single state, and is regulated by the state PUC, there can be practical limitations on a state's authority over the utility's resource mix in instances when the utility may jointly own a piece of power plant with other entities and must coordinate with those other entities on decisions related to resource retirement or extension of the useful life. In other words, the interconnected nature of the electrical grid across multiple state boundaries can serve as a practical limitation on state's authority over the resource mix of regulated utilities, regardless of the market construct in effect.

The implementation of organized wholesale market constructs does not change a state's legal authority over the resource mix of the utilities it regulates nor affect a state's legal ability to implement resource mix requirements, such as clean energy standards or RPSs. States' regulatory oversight over resource planning does not change under a real-time, day-ahead, or RTO construct. However, increased coordination with other states under these market constructs and the increased number of transactions settling through an organized wholesale market can impact economics of different resource types, which may have a practical effect of changing the economics of different resource types. This may, in turn, impact resource mix decisions. This secondary impact was considered in the rankings of market constructs in achieving this metric.

For instance, the application of certain market designs, such as an organized capacity market, can have a significant impact on the economics of different resource types. Recent controversy over PJM's capacity market rules helps demonstrate this point. In an effort to address concerns regarding price suppression in its capacity market, in 2018, PJM proposed to expand its Minimum Offer Price Rule (MOPR) by raising the price floor for new state-subsidized resources. In 2019, FERC directed PJM to expand the MOPR to apply to most resources receiving state subsidies.[56] States expressed concerns related to the potential impacts the rule could have on their state resource mix.[57] In comments filed with FERC, 45 state legislators indicated the MOPR could potentially affect their ability to achieve state policy goals and requested the MOPR be eliminated.[58] PJM has since proposed a more limited application of the MOPR and is expected to file a new proposal with FERC in the summer of 2021.[59] While, at this juncture, a capacity market seems unlikely to be implemented in a future organized market construct in the West, it is still important to consider the impacts of these types of market designs on state authority over the resource mix, as consideration of different market design options can help states understand the range of potential outcomes associated with a given market construct.

Bilateral: As discussed above, in a bilateral market, state commissions generally have jurisdiction over resource mix decisions through IRP processes and cost recovery determinations. States can legislate resource mix requirements, such as clean energy standards. But, when utilities operate across multiple states or share ownership in a large generating resource with other utilities, individual states may functionally share decisions on major resource retirements or additions with other states. In these situations, even a bilateral market construct can present practical limitations on a state's authority over the resource mix***. Thus, a bilateral market may provide, "good," "very good," or "excellent" authority over the resource mix of regulated utilities, depending on the specifics of the individual state and utility at hand.***

Real-Time: There are no changes to the authority of states over the resource mix with the addition of a real-time energy market. While real-time markets may include requirements to prevent "leaning" (e.g., resource sufficiency requirements), real-time transactions are a relatively small portion of overall transactions. This implies that real-time market resource sufficiency requirements are unlikely to have a meaningful practical impact on states' decisions around future resources/the resource mix. ***Thus, a real-time market earns a range of rankings consistent with the bilateral market of: "good," "very good," or "excellent."***

Day-Ahead No significant changes are expected to the authority of states over the resource mix from implementation of a day-ahead market. Day-ahead market requirements to prevent "leaning" may have

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[56] FERC Docket Nos. EL16-49-000 & EL18-178-000 (Consolidated)
[57] Utility Dive: FERC move to raise PJM capacity market bids shows "clear bias" against new, clean generation: Glick
[58] FERC Docket No. AD21-10-000
[59] Utility Dive: PJM proposes to end FERC MOPR policy that raised prices for state-subsidized resources and Utility Dive: PJM Board approved new MOPR plan in effort to placate states, FERC.

a marginal impact on state decisions are the future resource mix, but those requirements are not expected to impact a state's authority regarding resource mix decisions. However, the increased reliance on market prices, and the larger number of transactions settled at the market's prices, may have a greater impact on resource mix decisions than in a bilateral or real-time market construct. Yet these factors that differ in a day-ahead market are not expected to be significant enough to substantively change the range of rankings for a day-ahead market. ***Thus, a day-ahead market has a range of rankings consistent with the bilateral and real-time markets of: "good," "very good," or "excellent."***

RTO: Legally, there is no change in state authority over resource mix decisions due to the implementation of an RTO market construct, but there may be practical implications to individual state authority that result from market rules and requirements. RTO market requirements have an increased potential to affect future resource decisions and may provide greater ties between resource mix decisions of a given state and other states within the market footprint. Additionally, in an RTO, the vast majority of transactions are expected to be settled at market prices. Thus, market prices, and resulting economics, may have a greater practical impact on resource mix decisions than in other market construct. RTOs may also be more likely than other market construct to have market components, such as a capacity market, that impact the economics of individual resource types, though these elements are not a component of many RTO market designs. Thus, an RTO may have a greater practical impact on resource mix decisions than other market constructs. ***An RTO is ranked as "fair," "good," or "very good," for retaining state authority over resource mix decisions. The actual impact will depend on the RTO's design and a state's specific situation. An RTO design which includes a capacity market would end up at the bottom of this range with a "fair" ranking, while an RTO that does not include a capacity market and provides a strong role for states on issues that impact the resource mix may be "very good."***

Ability for state to retain authority over transmission planning and prudence/cost recovery for transmission investments

Ability of Market Construct to Retain State Regulatory Authority on Key Jurisdictional Elements	Bilateral	Real-Time	Day-Ahead	RTO
Ability for state to retain authority over transmission planning and prudence/cost recovery for transmission investments	*Good – Very Good*	*Good – Very Good*	*Good – Very Good*	*Fair – Good*
	As it exists today, states have various roles in transmission planning (with FERC-jurisdictional utilities adhering to FERC transmission planning Orders such as Order 890 and 1000), but states generally retaining siting authority for transmission. FERC has jurisdiction over rates and services for electric transmission in interstate commerce, but most states continue to determine how transmission costs are (or are not) passed on into retail electric rates. Market development, up to and including an RTO, can provide similar levels of "good" state authority over transmission planning and cost allocation, provided the market includes best practices for informed engagement and authority of a Regional State Committee over transmission -related matters.			

This metric focuses on a state's practical ability to retain authority over transmission planning decisions and cost recovery for transmission investments in different market structures. States have various roles in transmission planning decisions across the different market constructs evaluated in this report. Additionally, even under an RTO construct where significant amounts of transmission planning occur at the RTO level, individual utilities often retain authority for planning of facilities below a certain voltage and those plans serve as an input into regional planning efforts. FERC-jurisdictional utilities must comply with various FERC transmission planning requirements, including local planning requirements in Order 890 and regional planning and interregional coordination requirements in Order 1000. There can be different ways that states are involved in those processes,. In general, states retain (regardless of the market construct) authority over bundled retail electric rates. Those bundled retail rates include a transmission component, which may be influenced by the FERC regulated interstate wholesale transmission rate. But, states with bundled retail service determine the allowed recovery of transmission costs holistically, i.e., starting with transmission rate base, while recognizing and incorporating the pass-through of wholesale transmission credits and expenses, which are transacted at FERC regulated rates.

This metric reviews how each market construct might impact an individual state's authority over transmission planning and transmission cost recovery decisions. It is important to note that the biggest impact to a state's authority over transmission cost recovery determinations is a decision that can be made independent of the market construct: the decision to allow for unbundling of the transmission component from retail electric rates. This decision, if made, could allow FERC-approved interstate wholesale transmission rates to be passed through to retail customers without state oversight. But many states continue to have bundled retail electric rates under an RTO market construct and in some instances, such as some states approving Entergy's participation in MISO, the states have proactively prohibited the unbundling of transmission rates without explicit PUC approval.

Bilateral: In a bilateral market construct, utilities must comply with FERC transmission planning requirements (e.g., Order 890 and 1000) and states have varying roles in those planning processes. [60] Many states PUCs, or other state agencies, have some form of transmission permitting or Certificate of Public Convenience and Necessity (CPCN) authority that can be leveraged to influence transmission planning activities. FERC has jurisdiction over unbundled costs of retail transmission in interstate commerce (and thus over wholesale transmission rates), but most (though not all) states retain authority for bundled retail rates and what transmission costs are approved to be recovered in retail electric rates within their state. ***Thus, a bilateral market may offer "good" or "very good" ability for a***

[60] For example, NorthernGrid is a transmission planning association that facilitates regional transmission planning in the Northwest and Intermountain West and facilitates compliance with FERC requirements, including Orders 890 and 1000. NorthernGrid has a number of committees, including an Enrolled Parties and States Committee (EPSC). Each state may appoint up to two representatives and an alternate for each representative to the EPSC. EPSC members participate in the planning processes and provide study scope contributions and comments on the plans.

state to retain authority over transmission planning and transmission cost recovery. These rankings recognize that there is an important role for FERC in defining transmission planning requirements and in reviewing and approving wholesale transmission rates for interstate commerce,[61] along with a role for FERC defined transmission planning processes, but that states retain important tools that provide them with significant authority over transmission planning and cost recovery.

Real-Time: No substantive changes to transmission planning or transmission cost recovery are expected when transitioning from a bilateral market to a real-time market. ***Thus, like a bilateral market, a real-time market may provide states with "good" or "very good" authority over transmission planning and transmission cost recovery.***

Day-Ahead: Just like a real-time market, the implementation of a day-ahead market is not expected to bring any changes to an individual state's authority over transmission planning and transmission cost recovery. A day-ahead market is not assumed to include joint transmission planning; thus, transmission planning and siting authority in a day-ahead market is expected to be the same as under a bilateral or real-time market. ***A day-ahead market, like both the bilateral and real-time markets, may provide states with "good" or "very good" authority over transmission planning and transmission cost recovery.***

RTO: An RTO would perform regional transmission system planning and interregional coordination. This has the potential to decrease state involvement in transmission planning relative to other market constructs, but whether that occurs or not depends in large part on market design and the role that is given to states with respect to transmission planning activities. Transmission cost allocation rules for pricing transmission service occur at the RTO-level, but state ability to influence those rules will depend on market design and the role that is provided to a state committee on transmission cost allocation issues. Though it is not a given, there is a possibility for unbundling transmission rates under this market construct, which would give FERC authority over transmission component of retail rates. However, many states that have not unbundled transmission rates under an RTO and, thus, such an outcome is not a necessary outcome of RTO development in a state. Additionally, transmission permitting/CPCN authority is unlikely to change due to RTO formation (or RTO market design), providing at least "fair" authority for states on transmission build decisions in their state. ***Thus, depending on market design an RTO may provide "fair" or "good" or "very good" authority over transmission planning and transmission cost recovery. An RTO with a strong role for states in transmission planning and cost allocation decisions would help move this market construct to the "very good" rating.***

[61] FERC: An Overview of the Federal Energy Regulatory Commission and Federal Regulation of Public Utilities

Ability for state to retain authority over retail electric rates

Ability of Market Construct to Retain State Regulatory Authority on Key Jurisdictional Elements	Bilateral	Real-Time	Day-Ahead	RTO
Ability for state to retain authority over retail electric rates	*Good – Excellent*	*Good – Very Good*	*Good – Very Good*	*Fair – Good*
	The interconnected nature of the Western grid, including complexities around regulation of multi-state utilities, may serve to limit the practical authority a state has over retail electric rates, even when the state has full legal authority over these matters. Market development should not change the legal authority of states over retail electric rates. Though as more inputs into the ratemaking process come from a market, a state's ability to challenge costs may be diminished in practice. Market constructs, up to an RTO, can provide strong state authority on retail electric rates. States can improve their market experience through strong engagement in the market processes and through careful consideration of any proposals to unbundle retail rates.			
Recall, this assessment assumes no changes to retail choice programs and traditional, vertically-integrated utility service provision for most of the West is generally assumed under all of these market structures.				

This metric is focused on how the development of various market constructs might affect a state's authority over retail electric rates. At the outset it is crucial to note that, regardless of the market construct, the rates, terms, and conditions for sales of electricity to end users (i.e., retail sales) are state jurisdictional and market constructs, in and of themselves, do not change the legal authority states have over retail electric rates for utilities that are state regulated. Accordingly, from a purely legal perspective, each market construct could be rated as "excellent" for this metric. But there are practical realities that may impact the degree to which states have meaningful ability to change or significantly modify retail rates. Those practical realities were considered in this assessment and the rankings of each market construct on state authority over retail rates.

Additionally, under a bilateral market construct, states that regulate utilities which operate across multiple states may find that their individual state authority over retail electric rates is somewhat limited due to cost sharing agreements between the states in which the utility operates or other factors. In organized wholesale markets, as the scope of services expands, a greater share of ratemaking inputs will likely come directly from market costs and market revenues. State regulators may have very little *practical* ability to affect these inputs that come directly from the market or to find them imprudent to include in retail electric rates. The following rankings take these practical factors into consideration in evaluating a state's ability to retain authority over retail electric rates, rather than exclusively focusing on the legal changes over retail rate jurisdiction.

Bilateral: In the bilateral market construct, state PUCs have authority over the determination of bundled retail electricity rates for utilities under their jurisdiction. It is possible, though unlikely, under this market structure that a state may unbundle retail electric rates, for instance unbundling the

transmission component. If this were to happen, the state would likely simply pass through FERC-approved wholesale transmission rates to retail customers. But, absent this type of unbundling, states would holistically have authority for retail rate determination for utilities under their jurisdiction. In this market construct, there may be practical limitations on an individual state's authority when one or more regulated utilities in the state operates over multiple states. ***Thus, a state's practical authority over retail electric rates in a bilateral market may be "good," "very good," or "excellent" depending on the state's situation and the composition of the utilities it regulates.***

Real-Time: In a real-time market, state PUCs retain authority over the determination of bundled retail electricity rates, as they do in a bilateral market and the caveats discussed for a bilateral market apply to a real-time market as well. Even though a state's authority over retail rates is unchanged from a bilateral market, market revenues and costs associated with the real-time market may make rate setting more complex for state regulatory agencies and, potentially, harder to challenge, can be seen as marginally impacting a state's authority. ***Thus, a real-time market may provide state's "good" or "very good" authority over retail electric rates.***

Day-Ahead: In the day-ahead construct, as with bilateral and real-time, state PUCs continue to retain authority over the determination of bundled retail electricity rates and the caveats discussed for those markets are expected to apply to a day-ahead market as well. With more transactions occurring through the market in a day-ahead market construct, market revenues and costs are more important to the process of ratemaking and may be harder to challenge even though a state's legal authority is unchanged from bilateral market. ***Consistent with a real-time market, a day-ahead market is ranked as "good" or "very good." Though, it should be recognized that the additional transactions occurring in a day-ahead market may have a marginal impact on states' authority over retail rates relative to a real-time market, this is still captured in the good-very good range.***

RTO: Under an RTO construct, state PUCs retain authority over the determination of bundled retail electricity rates as they do in other market constructs. "Unbundling" of retail rates (most notably having the potential to result in FERC jurisdiction over transmission costs that are passed through to retail customers) is possible, but it is a separate issue from the creation of an RTO. In an RTO, it is potentially more difficult for states to disallow or challenge certain costs (e.g., transmission, resource adequacy-related) if they are involved in decisions around these costs at the RTO level (or even if they are not) and more inputs and assumption some directly from the RTO. ***Thus, an RTO may provide "fair" or "good" state authority over retail electric rates as the practical impact on state authority has the potential to be more than in other market constructs.***

Ability for states to be involved in the process of obtaining approval to participate in the market construct

Ability of Market Construct to Retain State Regulatory Authority on Key Jurisdictional Elements	Bilateral	Real-Time	Day-Ahead	RTO
Ability for states to be involved in the process of obtaining approval to participate in the market construct	*Fair*	*Good – Very Good*	*Good – Very Good*	*Excellent*
	State approval of market participation is almost certainly required for an RTO, while varying degrees of state approval may be necessary for other market constructs. States can utilize the approval process to place conditions on a decision to enter a market, which can help improve state retention of jurisdiction in the other metrics within this scorecard.			

Lead Team participants were interested in understanding, at a high-level, the regulatory approval processes that would be required to implement each market construct and how states might be involved in these approval processes. Appendix 1 provides a high-level overview of the regulatory approval processes that are expected for each market type and demonstrates that an RTO is more likely to trigger necessary state PUC approval than some of the other market constructs. This metric focuses, specifically, on how states can be involved in the approval process for regulated utilities seeking to implement each market construct. This metric was important to include in this scorecard as, when state approval is required for a utility to join a market construct, states can use that approval process as a tool to help improve the market's design and ensure a strong state role on the key jurisdictional areas discussed in the preceding metrics. The importance of the approval process for market participation and the consideration of conditions of approval was discussed in the "Special Considerations and Best Practices" section of this report.

Bilateral: Generally, there is no approval needed to participate in bilateral trading or be a part of a bilateral market construct. States can review bilateral trading costs for prudence and can review and approve utility risk policies around market trading activities. But, generally, states are not involved in the process of approving participation in a bilateral market. ***Thus, a state's authority over the approval process to participate in bilateral markets is ranked as "fair."***

Real-Time: As states seek to join a real-time market, the level of state involvement in the approval process for joining the market depends on the individual state, its statutes, and administrative codes (which were not reviewed in detail for this project). A review of the history of approval processes for real-time markets generally demonstrated relatively little state involvement in the initial approval process for real-time market participation. Most approvals for real-time market participation have come from FERC, though some states have approved or otherwise been involved in real-time energy market decisions (see Appendix 1 for additional details). Additionally, PUC groups (such as the PUC EIM group) were involved in early EIM filings that were filed at FERC. But their involvement was limited, like other stakeholders, to intervening, commenting, and protesting in the FERC approval processes. States may be

able to affect real-time market participation decisions through denial of real-time market implementation costs, though this would generally occur after the fact. ***Thus, a state's authority over the approval process to participate in a real-time market may be deemed "good" in instances where no state dockets are required to implement the market, but the state can be involved in the FERC approval process as an intervenor. For states that have statues and administrative codes that do require some sort of state review prior to participation, the ranking is deemed "very good."***[62]

Day-Ahead: There is still significant uncertainty around what the regulatory approval process for a day-ahead market might look like, given that there is not a clear, pre-existing design model for this type of market. But given that functional/operational control of transmission facilities will not be turned over in a day-ahead market, state PUC approval of this market construct is expected to be rather limited and very similar to a real-time market. ***Thus, just like a real-time market, a state's authority over the approval process to participate in a day-ahead market may be deemed "good" or "very good," depending on the specific requirements for review an individual state has.***

RTO: Regulated utilities seeking to turn over functional control of transmission facilities to an RTO generally need to obtain approval from state PUCs.[63] State PUCs can (and frequently have) placed conditions on the ability of a regulated utility to join a market as part of that approval process. As illustrated in the "Special Considerations and Best Practices" section and Appendix 1, these conditions have been used to enhance states' authority within RTO constructs (on elements such as transmission planning and cost allocation). ***Thus, a state's authority over the approval process to participate in an RTO is deemed "excellent," as regulated utilities generally require state approval before they can turn over functional control of transmission to the RTO. And conditions for approval that a state may include can be utilized as a tool to help increase state authority over other items.***

Summary Scorecard for Retaining State Regulatory Authority on Key Jurisdictional Elements

While it would be impossible for the summary scorecard above to capture all the nuances of each individual state's position, the position of each regulated utility, and the specifics of a market's design, the scorecards and "Special Considerations and Best Practices" in this section are intended to serve as tools for states as they consider the various potential outcomes associated with market proposals. Similar to the state policy goals scorecards above, it should be noted thoughtful market design can significantly influence a market's relative ranking.

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[62] An excellent ranking was not utilized here because, even where state approval was initially deemed necessary by the utility to join a real-time market, in one instance when such approval was not secured from the state PUC, there was still thought to be a path forward for participation in that market. However, to join an RTO and turn over operational/functional control of transmission, there is far more certainty that state approval is necessary prior to a utility joining the market.

[63] As an example, please see Laws Relating to the Public Utility Commission of Oregon.

Summary Market Factor Scorecard for Retain State Regulatory Authority on Key Jurisdictional Elements

Ability of Market Construct to Retain State Regulatory Authority on Key Jurisdictional Elements	Bilateral	Real-Time	Day-Ahead	RTO
Ability for state to retain authority over resource adequacy	Good – Excellent	Good – Excellent	Good – Very Good	Poor – Good
	As it exists today, the interconnected nature of the Western grid, including complexities around regulation of multi-state utilities, may limit the practical impact of state authority over resource adequacy. Market development, up to and including an RTO, can provide similar levels of "good" state authority, provided the market design includes best practices for informed engagement and authority of a Regional State Committee over resource adequacy matters. One individual state's ability to affect overall change on resource adequacy will depend on the market's governance, design and make-up.			
Ability for state to retain authority over the resource mix of utilities it regulates	Good – Excellent	Good – Excellent	Good – Excellent	Fair – Very Good
	As it exists today, the interconnected nature of the Western grid, including complexities around regulation of multi-state utilities and generation units with multiple owners, may serve as limitations on the practical authority states have over the resource mix of regulated utilities. Market development, up to and including an RTO, can provide similar levels of state authority over the resource mix, though market prices and market rules may impact resource mix decisions. The addition of market elements that are more likely to affect resource mix decisions (such as inclusion of a capacity market) can serve to reduce state's practical authority over the resource mix. States can improve their market experience by participating in market design and discouraging market elements that would serve to impact state's practical authority over the resource mix.			
Ability for state to retain authority over transmission planning and prudence/cost recovery for transmission investments	Good – Very Good	Good – Very Good	Good – Very Good	Fair – Good
	As it exists today, states have various roles in transmission planning (with FERC-jurisdictional utilities adhering to FERC transmission planning Orders such as Order 890 and 1000), but states generally retaining siting authority for transmission. FERC has jurisdiction over rates and services for electric transmission in interstate commerce, but most states continue to determine how transmission costs are (or are not) passed on into retail electric rates. Market development, up to and including an RTO, can provide similar levels of "good" state authority over transmission planning and cost allocation, provided the market includes best practices for informed engagement and authority of a Regional State Committee over transmission-related matters.			
Ability for state to retain authority over retail electric rates	Good – Excellent	Good – Very Good	Good – Very Good	Fair – Good
	The interconnected nature of the Western grid, including complexities around regulation of multi-state utilities, may serve as limitations on the practical authority a state has over retail electric rates, even when they have full legal authority over these matters. Market development should not change the legal authority of states over retail electric rates. Though as more inputs into the ratemaking process come from a market, a state's ability to challenge costs may be diminished in practice. Market constructs, up to an RTO, can provide strong state authority on retail electric rates. States can improve their market experience through strong engagement in the market processes and through careful consideration of any proposals to unbundle retail rates.			
Ability for states to be involved in the process of obtaining approval to participate in the market construct	Fair	Good – Very Good	Good – Very Good	Excellent
	State approval of market participation is almost certainly required for an RTO, while varying degrees of state approval may be necessary for other market constructs. States can utilize the approval process to place conditions on a decision to enter a market, which can help improve state retention of jurisdiction in the other metrics within this scorecard.			

8. Conclusion

This report has reviewed the three Market Factor Scorecards developed as part of the State-Led Market Study. These scorecards evaluated how different potential wholesale market structures might facilitate the achievement of each state's energy policy objectives. The scorecards and their associated metrics were developed based on two primary overarching Western state energy policy priorities and on how different market constructs might enable states to retain jurisdiction over key elements that may impact achievement of state energy policy priorities. The three scorecards assessed in this report were:

1. Increased use of clean energy technologies
2. Reliable, affordable provision of energy to consumers
3. Ability to retain state regulatory authority over key jurisdictional elements

The two overarching energy policy priorities (numbers one and two above) are *not* mutually exclusive, and many states are pursuing both policy priorities simultaneously. Some states may lean more towards one overarching goal or the other. Ultimately, it is up to the states to individually consider their respective weighting of each policy priority in considering energy market constructs and how those might assist in meeting that state's energy policy priorities. States will also need to review the specifics of any market proposal that comes before them, as different market designs may influence and change the generic rankings included in these scorecards.

States can also employ these scorecards to consider the potential impact on state regulatory authority of the various market constructs and how those impacts might be weighed against achieving a state's energy policy goals. As with the overarching energy policy priorities, it is ultimately up to each state to weight and prioritize the anticipated benefits of a market construct with the potential impacts to state authority. The Lead Team also identified several ways that states can improve their market experiences and retain authority, particularly under an RTO market construct. The specifics of a market proposal, and of an individual state's existing position, will be important for states to consider in evaluating how a specific proposal might impact state authority.

In sum, the scorecards provided generalized information regarding the potential achievement of overarching state policy goals and potential impacts to state authority. As such, the scorecards are intended to serve as a high-level tool of directional indicators for states as they individually and jointly evaluate options around their energy futures, but states will need to conduct more detailed analyses to evaluate specific market proposals that may come before them.

9. Appendix

A. Overview of Approval Processes

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Background

During the course of the project, the Lead Team indicated an interest in understanding, at a high-level, the differences in potential state and federal regulatory approval processes needed for each market construct. In response to that request, this Appendix reviews, at a high and generalized level, the regulatory processes that may be required at the state and federal level to implement a:

- Real-time market
- Day-ahead market
- Regional Transmission Organization (RTO) or Independent System Operator (ISO)

It is important to note that this assessment is **not** based on an in-depth review of federal and state statutes and administrative codes. Each state (and specifics of an individual market formation) will invariably have unique circumstances, rules, and regulations, but an in-depth review of state-by-state nuances was outside of the scope of the Market and Regulatory Review's Work Plan. In lieu of a state-by-state legal assessment, this high-level review relied primarily on historical examples of instances where these various market constructs were successfully implemented or were sought to be implemented.

Additionally, the reader should be aware that approval processes and the bodies involved in those approval processes will vary depending on the regulatory jurisdiction of the potential market participant. There is a mix of structures in the Western Interconnection, from investor-owned utilities (IOUs) to publicly owned utilities and power marketing administrations, among others. Non-IOUs will generally have less state involvement and will instead seek approval for market participation (of various forms) from their Board or administrator. However, organized markets generally involve Federal Energy Regulatory Commission (FERC) review and approval. [64] Entrance into an RTO or ISO generally requires regulated utilities to seek state Public Utility Commission (PUC) approval.

The subsequent sections of this Appendix include a high-level overview of market approval processes as well as several historical examples of these processes and state regulatory involvement.

Overview of Potential State Involvement in Approval Processes

The overview table below and subsequent historical examples are provided as illustrative examples of potential areas for state involvement in the approval or other processes associated with different organized market constructs. The state involvement outlined in the table, and the subsequent examples, are not necessarily required or applicable in all instances.

[64] Sections 201, 205, and 206 of the Federal Power Act gives FERC the power to regulate rates, terms, and conditions of wholesale sales of electric energy in interstate commerce, including all practices affecting such rates, terms, and conditions.

Potential Areas of State Involvement in Approval Processes		
Real-Time Market	**Day-Ahead Market**	**RTO or ISO**
• Participating in market policy and tariff design processes • Intervening in FERC process • Requiring cost-benefit analyses be submitted to the PUC • Imposing conditions to join a real-time market or for cost recovery of market implementation-related costs • Requiring PUC approval to join real-time market (based on historical experience this is less likely to be required in most cases)	• Participating in market policy and tariff design processes • Intervening in FERC process • Requiring cost-benefit analyses be submitted to the PUC • Imposing conditions to join a day-ahead market or for cost recovery of market implementation-related costs • Requiring PUC approval to join day-ahead market (similar to a real-time market this is less likely to be required in most cases)	• Participating in market policy and tariff design processes • Intervening in FERC process • Requiring cost-benefit analyses to be submitted to the PUC • PUC imposing conditions to join an RTO or for cost recovery of market implementation-related costs • Requiring PUC approval to join an RTO (expected to be necessary in most cases due to the utility turning over operational control of transmission to the RTO)

Real-Time Electricity Market

To assess the general regulatory approval processes for implementation of a real-time electricity market, the Market and Regulatory Review included a review of the processes undertaken at the state and federal levels to initiate and expand the Western Energy Imbalance Market (EIM) and a review of the approval processes for Southwest Power Pool's (SPP's) Western Energy Imbalance Service (WEIS) market.

Given that real-time electricity markets generally do not entail the transfer of operational/functional control of transmission facilities, the approval processes for implementing such markets tend to be concentrated at the federal level. This is because the relevant tariff provisions enabling the market are generally FERC-jurisdictional, and/or are implemented under the market operator's existing governance and tariff structure. However, there are some instances where, given specific state requirements, State PUCs were involved in different pieces of approval or review of a decision by a regulated utility to join a real-time market.

The following subsections provide a high-level overview of selected components of the research conducted related to approval processes for real-time energy markets. Based on that research, the list below illustrates the *generalized* process for real-time market participation approval (again recognizing that individual states, utilities, and market structures will have unique variations from this generalized

approval process). These steps generally follow some type of cost/benefit assessment and an announcement regarding the decision to form the market or for a new participant to join.

General Process for Real-Time Market Participation Approval

- Implementation and cost allocation agreement filed with FERC for approval
  - Sometimes this is done concurrently with the tariff filing
- Market policy developed by market operator:
  - Proposed market policy and tariff language developed by the market operator
    - Typically including one or more stakeholder processes
    - Approved through a market operator's existing processes (e.g., stakeholder committee structure and Board)
      - May or may not include involvement from state regulatory agencies, depending on market operator governance structure
  - Section 205 filing on tariff modifications/market design made by the market operator at FERC
- Tariff changes developed by individual participants
  - Necessary transmission tariff changes and policies developed via stakeholder process
  - Section 205 filing on tariff modifications made by the transmission service provider at FERC (or with another regulator)

Western EIM

This review included a look back at the processes used to initially establish the EIM and the process for subsequent participants. It also assessed several examples where state regulators were involved in the decision to join the EIM, either through a formal state regulatory docket or through involvement in a group of state regulators.

Initial EIM Implementation

The West's discussion of implementing a real-time energy market can be traced back to efforts to study a real-time market as part of the Efficient Dispatch Toolkit, which was being discussed at the Western Electricity Coordinating Council (WECC). That effort effectively culminated with a cost-benefit analysis and associated white-paper on risks, governance, and costs. Through these efforts, and efforts of a group of PUC commissioners that formed, called the PUC-EIM Group, several cost-benefit analyses were performed regarding a real-time energy market in the West. In 2012, the California Independent System Operator (CAISO) responded to a request from the PUC-EIM Group and put forward a proposal to establish the Western EIM.[65] Following that proposal, PacifiCorp announced its intention to join the EIM, which effectively kicked off the various regulatory and stakeholder processes to bring the EIM into operation.

[65] CAISO: CAISO Response to Request from PUC-EIM Task Force

CAISO filed an EIM Implementation Agreement at FERC which outlined the costs PacifiCorp would pay to the CAISO to implement PacifiCorp's participation in the market. The Implementation Agreement also affirmed key principles such as structure of market rules and oversight, provided a framework to resolve differences, and outlined a process for obtaining stakeholder input. [66]

As part of the process of implementing the market, the CAISO also initiated a process to develop a governance structure for the EIM. While this Appendix is not focused on governance-related issues, it is worth mentioning that, as part of the EIM's governance structure, the Body of State Regulators (BOSR) was created to provide a forum for state regulators to learn about the Western EIM, EIM Governing Body, and related ISO developments and to express a common position on CAISO stakeholder processes and EIM issues.

Stakeholder processes were also undertaken at both CAISO and PacifiCorp to develop the tariff provisions and policies necessary to establish the operation of the EIM. Various stakeholders, including states, participated in the CAISO and PacifiCorp stakeholder processes. The CAISO hosted a stakeholder process to develop tariff changes to implement the EIM, which were approved by the CAISO Board of Governors before making their way to FERC for approval.[67] PacifiCorp also initiated its own stakeholder process to develop tariff changes needed in its Open Access Transmission Tariff (OATT) to implement the new market. These tariff changes were filed with FERC for approval before the market became operational.[68] For PacifiCorp's initial entrance into the EIM, formal state PUC approval was not deemed necessary or obtained in any of the states that PacifiCorp operates in.

Additions of New EIM Entities

After the initial EIM was operational, similar regulatory approvals were needed for each new participant, including filing of an EIM Implementation Agreement with FERC outlining the costs the participant would pay and the milestones associated with each payment to the market operator (CAISO). Each participant has also updated its tariff to facilitate the EIM, typically utilizing a stakeholder process and then filing with the appropriate regulatory body (which is FERC for FERC-jurisdictional entities), effectively the same as the initial PacifiCorp process, though some key policy elements had been determined through the regulatory approval processes that allowed PacifiCorp and CAISO to establish the EIM.

Additionally, as the EIM has grown, the CAISO stakeholder process has addressed EIM design and made modifications to the EIM. These types of stakeholder processes continue, including a recently initiated stakeholder process to establish a new "EIM Sub-Entity scheduling role" to address settlement provisions that were requested by potential participants.

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[66] CAISO: PacifiCorp EIM Implementation Agreement
[67] FERC Docket No. ER14-1386-000
[68] FERC Docket No. ER14-1578-000

Examples of State Involvement in Decisions to Join the Western EIM

As demonstrated from the high-level review of the approval processes necessary for the EIM, the regulatory approval processes have been primarily at the CAISO and FERC level. Initial implementation of the EIM did not require approval of state PUCs that regulate PacifiCorp, though, the approval of EIM-related costs eventually came before those bodies for approval.

In some instances, cost approvals may happen earlier in market formation. An example of this is the Arizona Corporation Commission authorizing an accounting order to record and defer operations and maintenance costs associated with the implementation phase of Tucson Electric Power joining the EIM with certain conditions.[69] The Order also directed Tucson Electric Power to submit an annual compliance filing summarizing its deferred costs, annual revenues, and associated savings from its EIM membership.

However, there have been some instances in which state PUCs have been more involved in the process of implementing the EIM or approving a regulated utility's participation in it. A few examples are outlined below.

Example #1 of State Regulatory Involvement in EIM Approval: Nevada PUC Approval of NV Energy's EIM Participation

In addition to the "standard" stakeholder process and FERC filing processes outlined above, NV Energy filed for approval to join the EIM via an amendment to the Integrated Resource Plan (IRP) for each of its operating entities. This type of filing was necessary in Nevada because it constituted a modification to the Energy Supply Plan (ESP) for NV Energy's operating utilities. The EIM was a new strategy for optimizing assets within the ESP and thus a filing was made at the Nevada PUC to modify the ESPs of the operating companies.

NV Energy requested that the PUC find the amendment for EIM participation and supply optimization prudent pursuant to NAC 704.9494(3). The PUC found that it was in the public interest to grant the application and found that participating in the EIM was prudent so long as the benefits of participation exceeded NV Energy's costs.[70] Thus, state regulatory approval for participation in the EIM was deemed necessary in this instance for NV Energy based on the Nevada Administrative Code requirements.

Example #2 of State Regulatory Involvement in EIM Approval: Oregon PUC Required a Cost-Benefit Analysis of the EIM

The Oregon Public Utilities Commission (OPUC), in approving Portland General Electric (PGE's) 2013 IRP, directed a "comprehensive cost-benefit analysis of joining the PacifiCorp-CAISO EIM."[71] PGE was directed to conduct this comprehensive analysis by June 30, 2015, and to present the results at a

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[69] Arizona PUC Docket No. E-01933A-20-0039
[70] Nevada PUC Docket No. 14-04024
[71] Oregon PUC Order 14415

Commissioner workshop. OPUC outlined several different benefit types that must be included in the analysis.

Following completion of the analysis, PGE decided to join the CAISO EIM and moved forward with the general approval processes described above. Thus, the OPUC may have played a role in moving a participant towards a market solution, even though the PUC did not, and was not required to, formally approve a decision to for PGE to participate in the EIM.

Example #3 of State Regulatory Involvement in EIM Approval: Commission Cost Recovery Approval Sought by Public Service Company of New Mexico (PNM)

In August of 2018, after making an announcement of its intention to join the Western EIM in 2021, PNM filed an Application for Commission Order Governing the Accounting Treatment of Costs Related to Joining the Western EIM with the New Mexico Public Regulation Commission (NMPRC). In December 2018, the NMPRC issued a favorable order,[72] which, among other things approved carrying costs for PNM's expenses to join the EIM (with costs based on debt rates, rather than a weighted-average cost of capital) and created a regulatory asset for expenses incurred to integrate and join the EIM (to be adjudicated in a future rate case).

However, the Albuquerque Bernalillo County Water Utility Authority sought a rehearing, asserting the Commissioners did not have sufficient time to consider the issues before a decision was made. Subsequently, the NMPRC (which included newly seated members) issued an Order vacating the December 2018 order and granting a rehearing.

After the rehearing, the Commission issued an order in March 2019, which did not oppose PNM's entry into the EIM but also did not provide the ratemaking treatment that PNM had originally sought for EIM-related costs. The order on rehearing declined PNM's request to find "it is reasonable for PNM to join the EIM and expend the necessary funds to do so" and clarified that all EIM-related ratemaking issues would be deferred to a future rate case. The order on rehearing granted authority to create a regulatory asset to record the implementation costs incurred to join the EIM. It also required PNM to submit:

- Annual reports of PNM's EIM costs and savings
- Quarterly CAISO benefit reports
- Copies of all executed contracts with CAISO

Despite the less favorable order, which did not explicitly find that it was reasonable for PNM to join the EIM, PNM nevertheless moved forward with EIM implementation, including signing an EIM Implementation Agreement with CAISO in 2019. PNM began participating in the EIM on April 1, 2021.

[72] New Mexico PUC Docket No. 18-00261-UT

Thus, the NMPRC was involved in reviewing PNM's decision to join the EIM and laid out requirements for what must be filed with the NMPRC. But, in this instance, PNM was able to move forward with EIM participation without explicit state "approval" to participate in the market.

WEIS Market

Initial WEIS Implementation

The WEIS, similar to the EIM, began with a proposal[73] from the potential market operator, SPP. SPP established December 2019[74] as the deadline for entities to express interest in participation in WEIS and execute a Western Joint Dispatch Agreement to facilitate market development. From there, SPP began working with interested entities and hosting various committee meetings to develop the market rules and prepare for a filing at FERC to approve the market structure and tariff. In early 2020, the proposed WEIS Tariff, Western Joint Dispatch Agreement, and Western Markets Executive Committee Charter (WMEC) were filed with FERC.[75]

In general, most of the entities[76] seeking to join WEIS were not subject to PUC-jurisdiction over their rates. No state legislature or individual PUC required the entities to obtain their approval to join the WEIS.

The Colorado PUC did, however, file intervention and comment on SPP's WEIS Tariff. The Colorado PUC expressed concerns with the governance structure of WEIS and the allocation of administrative costs and encouraged FERC to instruct SPP to revise and clarify their proposal to include "meaningful state participation and avoid unintended cost allocation burdens."[77] More specifically, the Colorado PUC was concerned that:

- The WMEC is comprised solely of representatives that are not independent from market participants
- There is potential for disproportionate voting power
- The opportunity for state commissions to provide meaningful input to the WMEC is limited

Though SPP's initial WEIS tariff filing was rejected by FERC, that rejection did not center around the concerns raised by the Colorado PUC. And, following a revised filing that addressed the areas of deficiencies identified by FERC, SPP's revised WEIS tariff filing received FERC approval.[78] The revised filing did not include any additional avenues for state participation as those were not deemed necessary

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[73] SPP: Proposal for the SPP WEIS
[74] SPP: WEIS Implementation Milestones
[75] FERC Docket Nos. ER20-1059 & FERC ER20-1060
[76] Historically, Colorado, Nebraska, New Mexico and Wyoming did not exercise rate-regulation over Tri-State, though, in recent years, Colorado and New Mexico exercised rate jurisdiction in (Tristate.coop). In August 2020, FERC indicated it has exclusive jurisdiction over Tri-State's rates (FERC Docket No. EL20-16-001).
[77] FERC Docket No. ER20-1059
[78] FERC Order Nos. ER21-3-000 & ER21-4-000

for the WEIS to be "just and reasonable." Thus, in the currently operating WEIS, state participation is enabled through "state liaisons" comprised of one commissioner from each state with generation or load participating in the WEIS. The state liaisons serve in an advisory capacity on the WMEC. SPP officially launched the WEIS in February 2021, and no state PUC approvals or assessments were necessary for implementation of that particular market and set of market participants.

Day-Ahead Electricity Market

The concept of a day-ahead electricity market outside of the construct of a formal ISO or RTO has been contemplated, but never actually implemented, in the U.S. Thus, it is difficult to know with certainty, the regulatory approval processes that might be required for such a market construct. Furthermore, regulatory approval processes for a day-ahead market would likely depend on the details of the market design, the composition of market participants, and on individual state statutes and administrative codes.[79]

Despite this uncertainty, an example of a historical day-ahead market proposal may provide some insight into possible regulatory processes for this type of market, should it be proposed in the future. In 2008, the Midcontinent Independent System Operator (MISO)[80] proposed to develop and implement a day-ahead electricity market referred to as "Market Services." This section briefly reviews that proposal and what is known about the approval processes that were pursued for its creation; however, it should be noted that the MISO proposal and circumstances surrounding it may be substantially different than a day-ahead market proposal that may be developed for the West. This section also briefly considers a potential Western Day-Ahead Market and what approval processes might be required for such a market, recognizing that there is very little certainty at this time given the lack of specifics on a day-ahead proposal and market design.

MISO's Day-Ahead Market Service Proposal

In March of 2008, MISO submitted for FERC approval a proposed new "Module F "to their Open Access Transmission and Energy Markets Tariff; the module described new services that MISO intended to offer, which included a Market Service. The Market Service would provide "access to MISO's energy and ancillary services markets to the footprints of those taking Market Service."[81] But, similar to the real-time market construct evaluated in this study, individual participants would continue to administer their own tariff and transmission planning and would retain control over their transmission system. Thus, this market was as close to a "day-ahead" market construct as has previously been formally proposed in the U.S. and considered by FERC.

[79] As a reminder a review of individual state statues and administrative codes is outside of the scope of this review.
[80] At the time this proposal was made, MISO was known as the Midwest Independent System Operator.
[81] FERC Docket Nos. ER08-637-000, ER08-637-001, ER08-637-004, & ER08-637-005

MISO highlighted that the benefits of this market in making its filing with FERC. However, in the February 2009 final order,[82] FERC rejected the Market Services proposal, determining the potential benefits of the Market Service proposal did not outweigh the potential adverse impacts or long-term costs. FERC noted the proposal may create an incentive for current members to leave MISO in favor of the Market Service offering, which could create rate pancaking and would remove MISO's operational control from some areas. FERC expressed concern that this proposal could "adversely" impact the efficiency of the wholesale markets and could prevent transmission owners from joining MISO as full members and "institutionalize the seam." Lastly, FERC also found the proposal could cause negative impacts on MISO's ability to address reliability and operational issues or eliminate residual discrimination in transmission services. Thus, this proposal was never fully implemented.

State Involvement in MISO's Market Service Proposal at FERC

This review sought to evaluate the role of state PUCs, energy offices and other state agencies in the development and consideration of the MISO Market Service proposal. A search was conducted to seek to identify any state-level proceedings on the Market Service proposal or state PUC involvement in the development of this market construct. Outreach to MISO staff was also conducted as part of this effort to inquire about the proposal and state involvement in its development. The Market Service proposal is nearly 15 years old, and it is possible that a state docket or involvement was overlooked in this review. But, outside of the FERC docket in which some states intervened, no definitive state PUC dockets or examples of state participation in the development of the Market Service proposal were identified.

Within the FERC docket seeking approval of this market, joint intervention and comments were filed by the Indiana Utility Regulatory Commission and the Indiana Office of the Utility Consumer Counselor. These entities generally supported MISO's Market Service Proposal and expected the overall impact of the proposal would reduce costs to MISO customers by spreading administrative costs across a wider footprint, among other benefits. Although they generally supported the proposal, they expressed concern regarding the ability for new entities to participate in the MISO on more flexible terms than when the original transmission owners joined MISO; thus, they noted that there could be undue discrimination between the original transmission owners and the new participants. They recommended approval of the Market Service proposal subject to a "short-term condition of no more than a few years, at the end of which it could be revisited."[83]

Based on the review conducted as part of this effort, it appears that, for the Market Service proposal, state participation was limited to intervention and comment within the FERC proceeding.

Potential for State Involvement in a Western Day-Ahead Market

This subsection very briefly opines on the possible regulatory processes that might be requires to stand up a potential future Western day-ahead market and for state-regulated utilities to facilitate their

[82] FERC Docket Nos. ER08-637-000, ER08-637-001, ER08-637-004, & ER08-637-0059
[83] FERC Docket No. ER08-637-000

entrance into such a market. Currently, an initiative is underway (though on hold) at CAISO to develop an approach to extend participation in the day-ahead market to EIM entities in a framework similar to the existing EIM approach for the real-time market. This is known as the Extended Day-Ahead Market (EDAM). However, many of the specifics around that market's design are yet to be determined and, thus, there is significant uncertainty around what a potential day-ahead market may entail and what approvals would be required for it to move forward.

Based on discussions with some entities involved with the evaluation and design of EDAM, it appears the approval processes to join a day-ahead market would likely be comparable to the EIM. Similar to the EIM, operational control would not be turned over upon joining the EDAM. Therefore, it is possible, some states may not require any regulatory approvals to join the EDAM while others may require processes similar to those required for joining the EIM. The same would likely be true of any other day-ahead market proposal proposed in the west, such as the "Markets+" concept that SPP has begun work on. But the specifics of the approvals for a future day-ahead market will, of course, depend on the market structure, design, and its participants.

Regional Transmission Operator Market

ISOs and RTOs grew out of FERC Orders Nos. 888/889 where the Commission suggested the concept of an ISO as one way for existing power pools to satisfy the requirement of providing non-discriminatory access to transmission. In Order No. 2000, the Commission encouraged utilities to join RTOs which, like an ISO, would operate the transmission systems and develop innovative procedures to manage transmission equitably. While major sections of the country operate under more traditional market structures, two-thirds of the nation's electricity load is served in RTO regions.[84]

Of the market formations discussed in this Appendix, the RTO market construct would likely require the highest degree of state involvement in the approval processes, given the transfer of operational control and typical state requirements for state regulated utilities to obtain state PUC approval to effectuate such a transfer.[85] Based on historical examples, the general regulatory processes required to join an RTO or ISO, involves the approval of the relevant state commission(s) and FERC approval of the RTO transmission tariff facilitating integration. A high-level, *generalized* process is outlined below. However, recall that individual states, utilities, and market structures will have unique variations from this generalized process. Additionally, these steps often follow a cost/benefit analysis on ISO/RTO participation.

General Process for an Entity to Join an RTO

- Policy and tariff development initiatives
    - Tariff approval through RTO stakeholder process and at RTO board

[84] FERC: Market Assessments – Electric Power Markets
[85] As an example, please see Laws Relating to the Public Utility Commission of Oregon.

    - Tariff filed with FERC for approval via a Section 205 filing by the RTO
- Signed Transmission Owner Agreement (or equivalent) between transmission owning entity seeking to join the market and the RTO
    - Approval by RTO board
    - Filed at FERC for approval
- Filing for "transfer of control" approval and "public interest determination" with relevant state PUCs (for state regulated entities seeking to join the market)
    - PUCs typically addressed a monitoring plan, transition cost allocation plan, RTO exit authority, responsibility for reliability, RTO governance, and commission jurisdiction, among other things, within these dockets

Entergy's Entrance into MISO

In April 2011, Entergy announced its intention to join the MISO RTO with an anticipated integration date of December 2013. This section reviews, at a high-level, some elements of the various state approval processes that were necessary for Entergy to join the MISO RTO.

In order to join MISO, Entergy was required to file an application, for approval to transfer operational control of its transmission assets to the MISO RTO, in each state where it delivered electricity to customers: Arkansas,[86] Louisiana,[87] Mississippi,[88] and Texas.[89] All four state Commissions gave their approval, subject to conditions, including conditions around expanding or retaining the role of the states under an RTO construct. Below is a short selection of some of the conditions set forth in the states' Orders.

- The Arkansas PUC ordered that the Organization of MISO States—which is the self-governing organization with a board comprising a commissioner from each Member state with regulatory jurisdiction over entities participating in MISO—must have "legally recognized responsibility" for the following regulatory activities:
    - Determining regional proposals regarding transmission planning and cost allocation; and
    - Directing MISO to construct transmission upgrades and choosing the approach to be utilized for assessing resource adequacy.
- The Arkansas and Texas PUCs ordered that the Entergy Regional State Committee (ERSC) retain the same governance authority in MISO during the transition period (including the ability to act on transmission planning and cost allocation issues by majority vote).
    - After the five-year transition period, the Arkansas PUC instructed Entergy to file a detailed report providing:
        - Historical and projected net benefits of MISO membership;

[86] Arkansas PUC Docket No. 10-011-U, Order No. 68
[87] Louisiana PUC Order No. U-32148
[88] Mississippi PUC Docket No. 2011-UA-376
[89] Texas PUC Docket No. 40346

    - Any significant changes in FERC RTO policies, rules or regulations, MISO requirements, Day 2 market conditions, or other regulatory or market structure components; and
    - Estimate of costs to exit MISO after end of the five-year transition period.
- The Texas PUC also ordered MISO to file with FERC to expand the retail representation of the Advisory Committee to include a retail regulator from the ERSC and to create a new retail regulatory committee that reports directly to the Board of Directors of MISO.
- Arkansas, Louisiana, and Texas orders indicated that Entergy could not unbundle transmission or make changes to transmission service for retail ratemaking without the PUC's approval.
- The state PUCs indicated that Entergy needed state PUC approval to exit MISO and state PUCs could also direct Entergy to exit MISO.

On April 19, 2012, FERC approved the proposed tariff revisions of MISO to facilitate the integration of Entergy as a member of the RTO, which included changes to address the relevant conditions states put on Entergy's entrance into the market.[90] Entergy's entrance into MISO demonstrates the role of states in the approval process to join an RTO and highlights some of the conditions for approval that have been used by states in the past.

Conclusion

This Appendix sought to shed light on areas of potential state involvement in the approval processes for different market construct primarily by reviewing several historical examples of approval processes. As illustrated by the examples herein, states may have several opportunities to participate in regulatory approval processes for market implementation as entities seek to participate in various markets. Turning over operational/functional control of transmission facilities is only expected to occur in an RTO, and it is this action which triggers the highest degree of expected state regulatory involvement in the process for joining the market. But some state PUCs have required approval and set conditions for real-time market participation and could be expected to do the same with a future day-ahead market.

Again, it is important to note that this Appendix was **not** based on an in-depth review of federal and state statutes and administrative codes. Each state, market formation, and participating entity will have its own unique circumstances, rules, and regulations. Nonetheless, this Appendix may serve as a high-level tool for Western states as they independently and jointly consider options and make decisions around their energy futures.

[90] FERC Docket No. ER12-480-000

Appendix B. Summary of Participating State Energy Policy Priorities and Key Regulations

The information in the following table was compiled in September 2019 and was utilized by the Lead Team during the project development phase. Please note that the table has **not** been updated since its original compilation and reflects state energy policy priorities as of 2019.

State	State Energy Policy Priorities [as of September 2019]
Arizona	• RPS of 15% by 2025 • Arizona's last Master Energy Plan was drafted in 2013 and approved by former Governor Brewer in 2014[91] • Governor Ducey believes in the benefits of Arizona's balanced energy portfolio, and that market forces — including those that have driven down the cost of natural gas — make additional climate-change regulation unnecessary for the electricity sector[92]

California	• SB 100
	  ○ Procurement of electricity products from eligible renewable energy resources: 25% of retail sales by 12/31/2016; 33% by 12/31/2020; 44% by 12/31/2024; 52% by 12/31/2027; 60% by 12/31/2030
	  ○ Eligible renewable energy resources and zero-carbon resources to supply 100% of all retail sales of electricity to California end-use customers and 100% of electricity procured to serve all state agencies by 12/31/2045. [the 100% policy]
	  ○ The CPUC, CEC and CARB shall issue a joint report to the Legislature by 1/1/2021, and at least every four years thereafter, that includes the following:
	  ▪ A review of [the 100% policy] focused on technologies, forecasts, then-existing transmission, and maintaining safety, environmental and public safety protection, affordability, and system and local reliability
	  ▪ An evaluation identifying the potential benefits and impacts on system and local reliability associated with achieving [the 100% policy]
	  ▪ An evaluation identifying the nature of any anticipated financial costs and benefits to electric, gas, and water utilities, including customer rate impacts and benefits
	  ▪ The barriers to, and benefits of, achieving [the 100% policy].
	  ▪ Alternative scenarios in which [the 100% policy] can be achieved and the estimated costs and benefits of each scenario

[91] National Association of State Energy Officials State Energy Plan Repository: emPOWER Arizona
[92] Arizona Central: Where Arizona Candidates Stand on Climate Change, Water Issues, and Heat-Related Deaths

	• SB 350
	  ○ Double energy efficiency by 2026 relative to the AAEE in 2016 IEPR.
	  ○ Reduce emissions of GHG to 40% below 1990 levels by 2030 and to 80% below 1990 levels by 2050
	• AB 32 & SB 32
	  ○ Reduce GHG emissions to 1990 levels by 2020
	  ○ Reduce GHG emissions to 40 percent below 1990 levels by 2030
	• Other goals
	  ○ Reduce methane and hydrofluorocarbon (HFC) refrigerants to 40 percent below 2013 levels by 2030 (SB 1383).
	  ○ 5 million ZEVs on the road by 2030 as well as a network of 200 hydrogen refueling stations ad 250,000 electric vehicle charging stations, including 10,000 direct current (DC) fast chargers by 2025 (Executive Order B-48-18)
	  ○ Achieve carbon neutrality (zero-net GHG emissions) by 2045 and maintain net negative emissions thereafter (Executive Order B-55)
	  ○ Reduce GHG emissions in residential and commercial buildings to 40 percent below 1990 levels by January 1, 2030 (AB 3232), which will require building electrification
	  In addition, California is the first state to require rooftop solar on new homes under new building standards that go into effect on January 1, 2020

Colorado	• Colorado has a 30% by 2020 RPS for investor-owned utilities • HB19-1261 established statewide goals to reduce 2025 GHG emissions from the 2005 baseline by at least 26% by 2025, 50% by 2030, and 90% by 2050[93] ○ These are economy-wide (not just the electric sector) and include various GHG, not just carbon dioxide • SB19-236 directed Xcel Energy to file a Clean Energy Plan that will reduce GHG emissions 80% below 2005 levels by 2030, and 100% by 2050 • SB19-236 also directs the Public Utilities Commission to explore whether utilities should join a regional transmission organization or an energy imbalance market[94] • Governor Polis, who took office in 2019, has an administration goal of 100% renewable electricity by 2040
Idaho	• Idaho's last energy plan was completed in 2012 and includes objectives of ensuring secure, reliable, and stable energy and maintaining low-cost supply • In 2019, Governor Little noted that *"through the free market and innovations at the Idaho National Laboratory, Idaho will continue to expand opportunities for clean and affordable energy for our citizens and the world"*[95]

[93] Colorado Legislature: House Bill 19-1261
[94] Colorado Legislature: Senate Bill 19-236
[95] Idaho Press: Full text of Gov. Little's State of the State and budget address

	• Though no Idaho legislation or regulation required this, two of Idaho's major investor-owned utilities (Idaho Power and Avista) are pursuing 100% clean energy goals by 2045
Montana	• Montana has a 15% RPS[96] • On July 1, 2019, Governor Bullock created the Montana Climate Solutions Council and announced that Montana would join the US Climate Alliance ○ The Council shall provide recommendations and strategies for the State of Montana to reduce greenhouse gas emissions • Governor Bullock released a blueprint for Montana's Energy Future in 2016 ○ The plan includes support for energy infrastructure development, the existing RPS, solar and wind power development, carbon capture technologies, and energy efficiency[97]
Nevada	• In 2019, Nevada passed legislation (SB 358) which establishes an RPS of 50% by 2030 for retail electric customers and sets a goal of 100% zero-carbon electricity by 2050. • Also in 2019, Nevada passed legislation (SB 254) that establishes state GHG emission reduction targets of 28 percent below 2005 levels by 2025, 45 percent by 2030 and net zero, or near net zero, emissions by 2050. • Governor Sisolak joined Nevada to the US Climate Alliance in March of 2019.
New Mexico	• In 2019, New Mexico passed the Energy Transition Act (SB 489) which establishes New Mexico's pathway to a zero-carbon electric industry, by creating an RPS of 40% by 2025, 50% by 2030, and 80% by 2040 for investor-owned utilities ○ Investor-owned utilities must also reach a 100% clean energy standard by 2045 ○ Co-ops must achieve the RPS requirements and must also meet the 100% clean standard by 2050[98] • Governor Lujan Grisham seeks to make New Mexico a leader in fighting climate change • The 2019 legislative session also resulted in updated Energy Efficiency standards for utilities (HB 291)[99]
Oregon	• In 2016, Oregon passed legislation (SB 1547) that established a 50% RPS for investor-owned utilities by 2040, with additional interim goals, and separate goals for smaller utilities • SB 1547 also eliminated coal as a resource for electric utilities by 2030[100] • Governor Brown's vision for energy policy is that *"Oregon has a strong, innovative, and inclusive economy that achieves the state's climate emissions*

[96] *Note: In 2021, HB 576 repealed Montana's RPS*
[97] Governor Bullock: Blueprint for Montana's Energy Future *Note: This webpage is no longer active.*
[98] New Mexico Senate Bill 489
[99] New Mexico House Bill 291
[100] Oregon Senate Bill 1547

	goals through a complementary set of policies, including a least-cost, market-based GHG emissions pricing program"[101]
Utah	• In 2008, Utah established a 20% by 2025 RPS mandate, if cost effective (SB 202) • In 2019, Utah passed HB 411, the Community Renewable Energy Act, which allows for communities served by PacifiCorp's Rocky Mountain Power to move to 100% net renewable energy[102] • Governor Herbert's administration supports strategic infrastructure and ensuring value for Utahns, and champions an "all of the above" energy policy[103] ○ Specifically, "*It is the policy of the state that Utah shall have adequate, reliable, affordable, sustainable, and clean energy resources*"[104]
Washington	• Washington has an older RPS of 15% by 2020 • Washington's SB 5116 passed in the 2019 session and will transition Washington to 100% clean energy for its electricity supply ○ Under the legislation, coal-fired resources are prohibited for electric utilities as of 2026 ○ By 2030, 80% of all sales of electricity to Washington retail electric customers must be from non-emitting or renewable resources, and 100% by 2045 ○ Between 2030 and 2045, utilities have a requirement to be GHG neutral, so if the utility is still relying on natural-gas, diesel, and wood fired resources for up to 20% of retail sales, compliance may be met through alternative compliance measures specified in the law[105]
Wyoming	• Wyoming's last energy plan was completed in 2013[106] • Senate File 159, which passed in 2019, requires utilities (e.g., PacifiCorp's Rocky Mountain Power) to attempt to sell coal plants rather than retire them ○ Furthermore, the utility is required to buy back power from the purchaser, and the bill guarantees cost recovery from the utility's Wyoming customers for those costs[107] • Governor Gordon promises to ensure "responsible development" of Wyoming's natural resources and to make Wyoming a "leader in advanced energy technologies including Carbon Capture and Storage"[108]

[101] Oregon Climate Agenda: A Strong, Innovative, Inclusive Economy While Achieving State Climate Emissions Goals
[102] Utah House Bill 411
[103] Governor Herbert Administration Utah Office of Energy Development: Energy Policy Solutions *Note: This webpage is no longer active.*
[104] Utah State Energy Policy
[105] Washington Senate Bill 5116
[106] National Association of State Energy Officials State Energy Plan Repository: Wyoming
[107] Wyoming Senate Bill 159
[108] Governor Gordon Website: Issues