



Western Market Issues

Joint Interim Committee on Growth & Infrastructure

January 12, 2022



- Wholesale Energy Market – Bilateral & Organized
- SB 488 Regional Transmission Organization Requirement
- Incremental regional initiatives
 - Western Energy Imbalance Market (EIM)
 - Energy Day Ahead Market (EDAM)
 - Western Resource Adequacy Program (WRAP)
 - Regional Transmission Planning – FERC Order 1000
- Multi-attribute regional initiatives
 - Western Market Exploratory Group (WMEG)
 - Southwest Power Pool Expansions
 - WEIS
 - RTO Expansion
 - Markets Plus
- Greenlink Transmission Projects

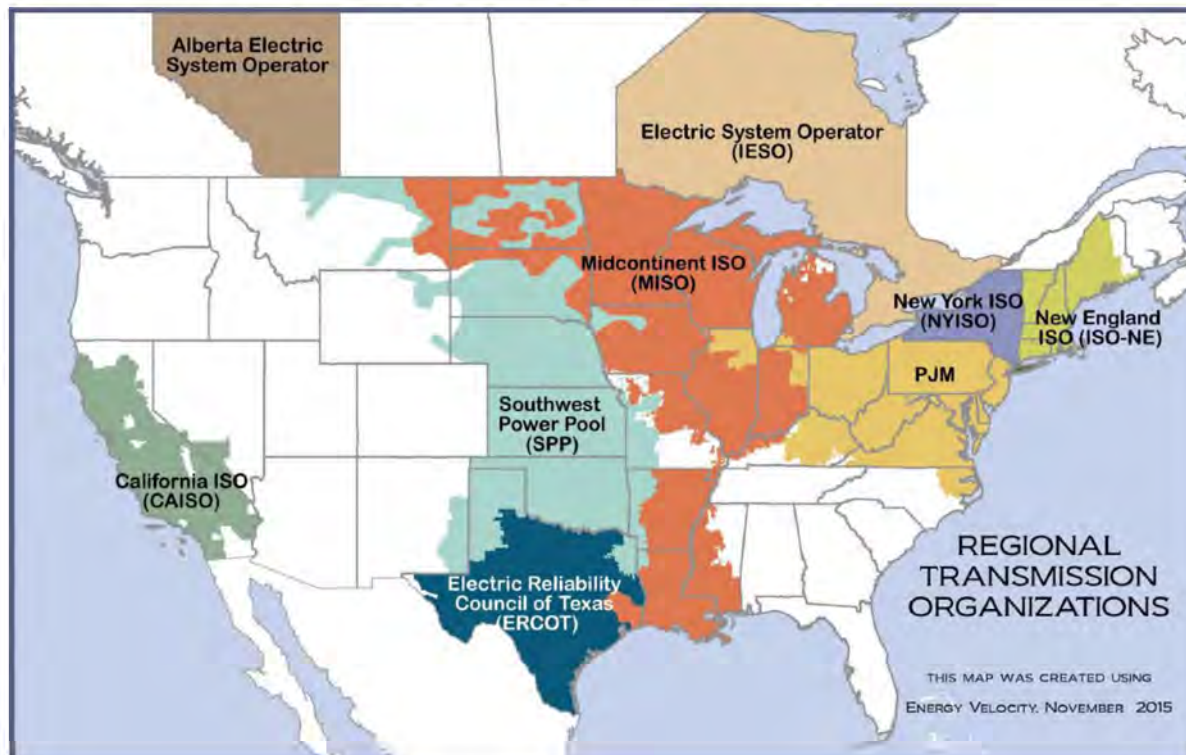


Energy Market Basics

Types of Wholesale Energy Markets



- “Bilateral market” - individual utilities are responsible for maintaining the supply and demand balance in their Balancing Authority Area; power is procured in separate transactions with transmission service arranged under an open-access transmission tariff;
- “Organized markets” -- a regional transmission organization (RTO) or independent system operator (ISO) is the regional Balancing Authority Area; operates the transmission systems of participating utilities; and conducts bid-based markets





Organized Market Attributes

- Bid-based markets (day-ahead energy, real-time energy, ancillary services)
- Minimize the cost of generating enough electricity to meet load by using the least cost set of available generators possible given limitations of the transmission system -- known as “least-cost, security-constrained dispatch”
- All RTOs and ISOs use a form of pricing called locational marginal pricing (LMP)
 - the LMP is the cost of providing one more megawatt of power at a specific location on the grid
 - the LMPs serves as a dispatch signal -- if the LMP is at or above a generator’s offer price, the offer is taken and the generator is paid at the LMP; if the LMP is below the offer, the offer is not accepted and the generator is not used
- RTOs approved by the Federal Energy Regulatory Commission include consolidated balancing area operations, regional transmission planning, and a resource adequacy program



SB 448

Regional Transmission Organization Requirement



- Section 30 provides that transmission providers **must join an RTO on or before January 1, 2030**
- Requirement can be waived or delayed by the Public Utilities Commission of Nevada
 - Application for waiver or delay is due by January 1, 2027
 - Transmission provider must demonstrate:
 - Unable to find viable RTO despite reasonable efforts to comply, or
 - Joining an RTO is not in the best interest of the transmission provider and its customers
 - PUCN will grant the application if it is in the public interest

SB 448 Definition of RTO



Entity established to coordinate and efficiently manage the dispatch and transmission of electricity among public utilities on a multistate or regional basis:

- Approved by FERC
- Separate control of transmission facilities from control of generation facilities
- Implements policies/procedures to minimize pancaked transmission rates
- Improves service reliability within Nevada
- Achieves the objectives of an open and competitive wholesale electric generation marketplace, elimination of barriers to market entry and preclusion of control of bottleneck electric transmission facilities
- Operates to substantially increase economical supply options for customers
- **Structure of governance or control that is independent of the users of the transmission facilities**
- Policies promote positive performance to satisfy electricity requirements of customers;
- Inclusive and open stakeholder process
- Promotes and assists new economic development in Nevada; and
- Capable of maintaining real-time reliability of the transmission system, ensuring comparable and nondiscriminatory access and necessary service, minimizing system congestion and further addressing real or potential transmission constraints

Task Force



- **Sections 31 to 34 create the Regional Transmission Coordination Task Force**
- Must meet at least 2 times a year; can utilize working groups with subject matter experts
- Advise the Governor and Legislature on:
 - Costs and benefits of joining an RTO to transmission providers and their customers
 - Policies to accommodate RTO entrance by January 1, 2030
 - Policies to site transmission facilities necessary to achieve Nevada's clean energy and economic development goals
 - Areas where growth in demand for electricity or renewable energy generation would be accommodated by additional regional transmission opportunities; and
 - Businesses that could locate in Nevada as a result of joining an RTO
- **Task Force shall submit report to Governor and Legislature no later than November 30, 2022 and every 2 years thereafter describing its activities and include any recommended legislation to enable RTO participation**
- PUCN, in consultation with the Task Force, may retain an independent third party to analyze all factors deemed necessary to assess the potential costs and benefits to transmission providers and their customers of forming or joining an RTO

Membership



Task force members include a Chair, appointed by Governor, and a representative of:

- Electric utility serving densely populated counties
- Rural electric cooperative/municipally owned electric utility
- Colorado River Commission
- Transmission line development company
- Large-scale solar energy industry
- Geothermal energy industry
- Data center business
- Mining industry
- Gaming and resort business
- Labor organization
- Environmental/public lands organization
- Nevada Indian Commission
- Office of Energy
- Office of Economic Development
- Senate (two members)
- Assembly (two members)
- General public (up to three members)
- Public Utilities Commission (nonvoting)
- Bureau of Consumer Protection (nonvoting)
- Sen. Chris Brooks (chairman)
- David Bobzien, director, Governor's Office of Energy
- Kris Sanchez, deputy director, Governor's Office of Economic Development
- Carolyn Barbash, vice president, transmission development and policy, NV Energy
- Carolyn Turner, executive director, Nevada Rural Electric Association
- Cameron Dyer, managing senior staff attorney, Western Resource Advocates
- Eric Witkoski, executive director, Colorado River Commission of Nevada
- Erik Hansen, chief sustainability officer, Wynn Resorts
- Jeremy Newman, assistant business manager, IBEW Local Union 396
- Leslie Mujica, executive director, IBEW/NECA/LMCC - Las Vegas Power Professionals
- Luke Papez, director, project development, LS Power Development
- Richard Perkins, president/CEO, The Perkins Co.
- Mona Tierney-Lloyd, head, U.S. state public policy and institutional affairs, Enel North America
- Samuel Castor, EVP of policy, Switch
- John Seeliger, regional energy manager, Nevada Gold Mines
- Kostan Lathouris, managing member, Lathouris Law PLLC
- Rebecca Wagner, owner/consultant; Wagner Strategies
- Elizabeth Becker, FEMA, Local Hire - emergency management specialist
- Hayley Williamson, chair, Public Utilities Commission of Nevada



Incremental Market Initiatives

Continued Expansion of the EIM



- By 2023 there will be 22 active participants representing 84% of the demand in the Western Electric Coordinating Council (currently 67%)

Participants

Active

[PacifiCorp](#) – entered 2014
[California ISO](#) – entered 2014
[NV Energy](#) – entered 2015
[Arizona Public Service](#) – entered 2016
[Puget Sound](#) – entered 2016
[Portland General Electric](#) – entered 2017
[Idaho Power Company](#) – entered 2018
[Powerex](#) – entered 2018
[Balancing Authority of Northern California](#) – entered 2019
[Salt River Project](#) – entered 2020
[Seattle City Light](#) – entered 2020
[Los Angeles Department of Water & Power](#) – entered 2021
[NorthWestern Energy](#) – entered 2021
[Public Service Company of New Mexico](#) – entered 2021
[Turlock Irrigation District](#) – entered 2021

Pending

[Avista](#) – entry 2022
[Tucson Electric Power](#) – entry 2022
[Tacoma Power](#) – entry 2022
[Bonneville Power Administration](#) – entry 2022
[Avangrid](#) – entry 2023
[El Paso Electric](#) – entry 2023
[WAPA Desert Southwest Region](#) – entry 2023



Map boundaries are approximate and for illustrative purposes only.

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EIM Benefits



- Benefits include reduced costs to serve customers, improved situational awareness for increased reliability, more effective integration of renewables, and better utilization of the transmission system

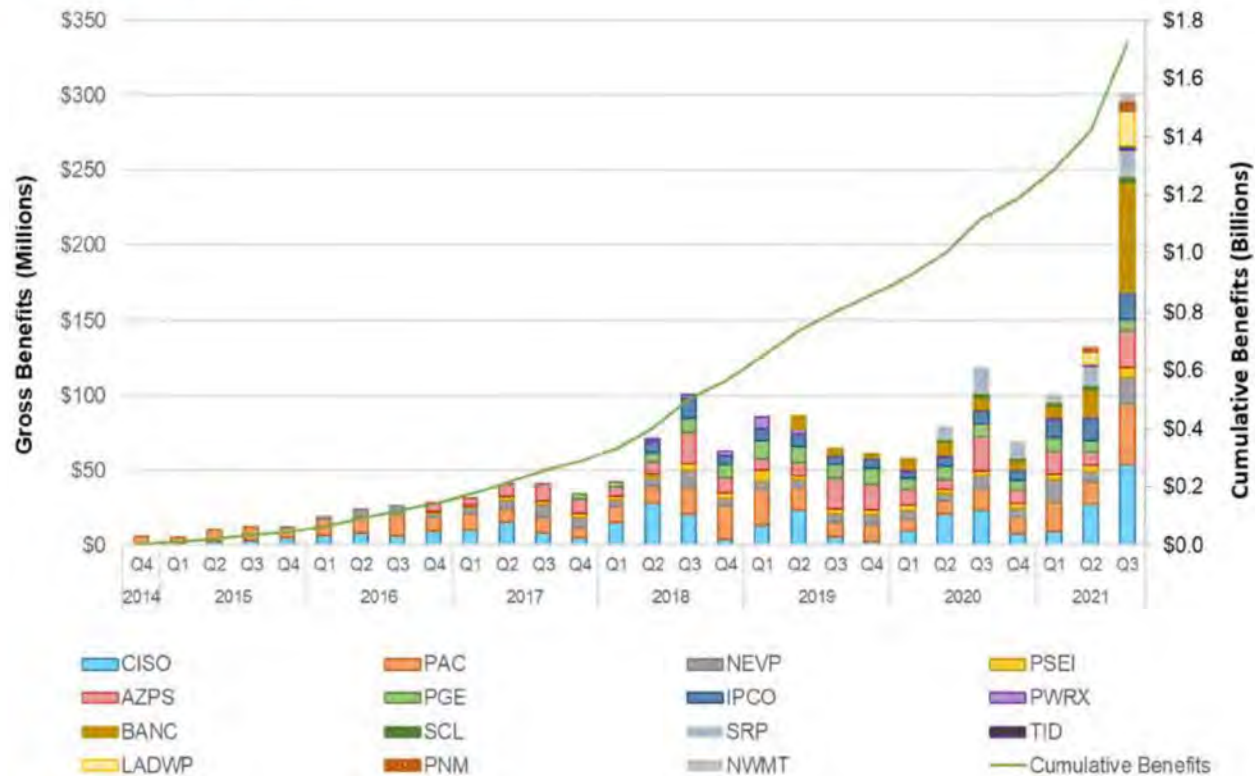
- Total NV Energy benefits to date:
\$151.3 million

	2016	2017	2018	2019	2020	2021
January	0.34	1.07	0.87	1.09	1.10	1.36
February	0.75	1.31	2.07	2.20	1.80	10.99
March	0.62	1.12	1.23	2.42	2.46	1.79
Q1 Total	1.70	3.50	4.17	5.71	5.36	14.14
April	1.09	2.37	2.55	1.23	2.34	1.52
May	1.34	2.25	1.98	1.33	1.51	1.88
June	2.77	1.08	0.81	2.06	0.88	2.80
Q2 Total	5.20	5.70	5.34	4.62	4.73	6.20
July	1.88	2.28	4.07	1.47	1.89	7.44
August	2.16	3.41	4.96	1.52	4.18	3.08
September	1.55	2.86	2.06	2.93	2.74	7.52
Q3 Total	5.60	8.55	11.09	5.92	8.81	18.04
October	1.00	2.63	1.73	2.47	3.73	
November	1.47	2.96	1.51	2.63	1.60	
December	0.60	0.86	1.71	1.52	0.39	
Q4 Total	3.07	6.45	4.95	6.62	5.72	
Annual Total	14.94	24.10	25.55	22.87	24.62	38.38

Cumulative Benefits



Cumulative benefits through Q3 2021 reached \$1.72 Billion



Extended Day-Ahead Market (EDAM)

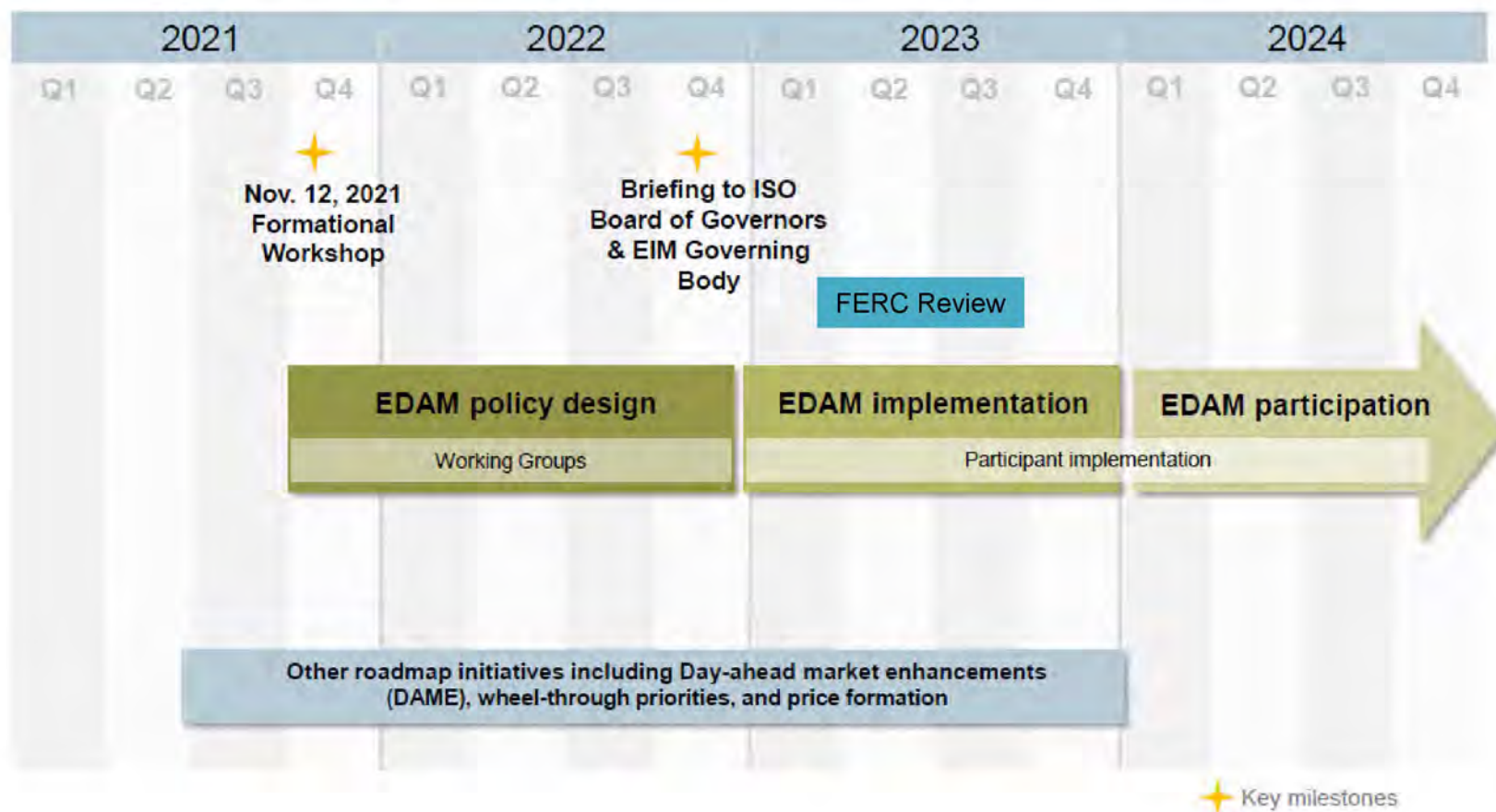


- The EDAM would extend the CAISO's day-ahead market to EIM Entities who choose to participate
- Participation in CAISO day-ahead market could allow for:
 - Additional fuel and purchase power cost savings
 - Additional renewables integration
 - Opportunity to more effectively and efficiently manage flex reserves
- Would allow EIM Entities to leverage systems integration work done to participate in EIM - transmission in CAISO model, systems to bid resources, report outages, and settle market transactions
- EDAM is not equivalent to becoming a full member of CAISO (or any other RTO)
 - Transmission control, planning and cost allocation remains with NV Energy
 - Resource Adequacy and Resource Planning will continue to remain with member utilities and their respective regulating authorities
- EDAM is not intended to result in any changes to state regulatory authority
- October 13, 2021 Forum restarted the stakeholder process – expected to take a year
- No determination as to whether NV Energy will participate: (1) see the details of the market, (2) engage in company-specific cost benefit study, (3) PUCN approval

CAISO EDAM Schedule



Extended day ahead market development plan



Northwest Power Pool Resource Adequacy Program



- Beginning in early 2019, the Northwest Power Pool (NWPP) has coordinated a broad coalition to explore the challenge of resource adequacy and has developed a Western Resource Adequacy Program (WRAP)
- The RA Program will establish:
 - Common measures of adequacy, including peak load standards and methods of measurement;
 - Common measures of resource contribution to resource adequacy;
 - An approach for the allocation of the regional adequacy requirement;
 - Methods for accessing the regional diversity and unlocking investment savings;
- Status
 - SPP retained as program operator
 - Preparing a non-binding test of forward showing requirements for Summer 2022 and Winter 2022-23
 - Anticipate being fully functional by 2024
- NV Energy is participating in the current phase (3A) to determine long term feasibility and benefits

NWPP Participants



- **Initial Phase 3A Participants**

- APS
- Avangrid
- Avista
- Black Hills
- BPA
- Calpine
- Chelan PUD
- Clatskanie PUD
- Douglas PUD
- EWEB
- Grant PUD
- Idaho Power
- NorthWestern
- NV Energy
- PacifiCorp
- PGE
- Powerex
- PSE
- SCL
- Shell
- Snohomish PUD
- Tacoma Power
- TEA
- TID

New Entrants

- APS
- SRP

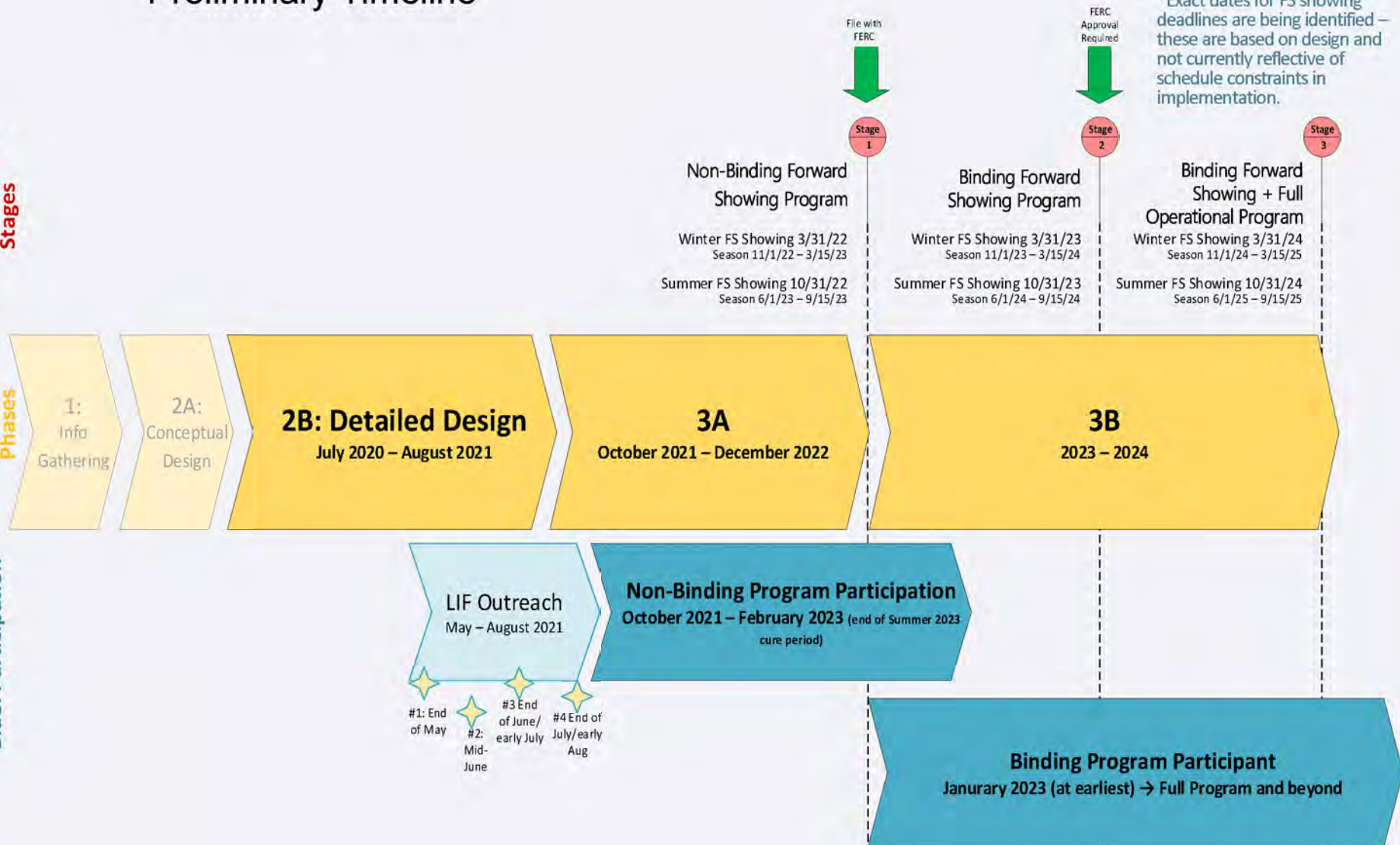


Preliminary Timeline

Red: Functionality Stages

Yellow: Design Phases

Blue: Participation

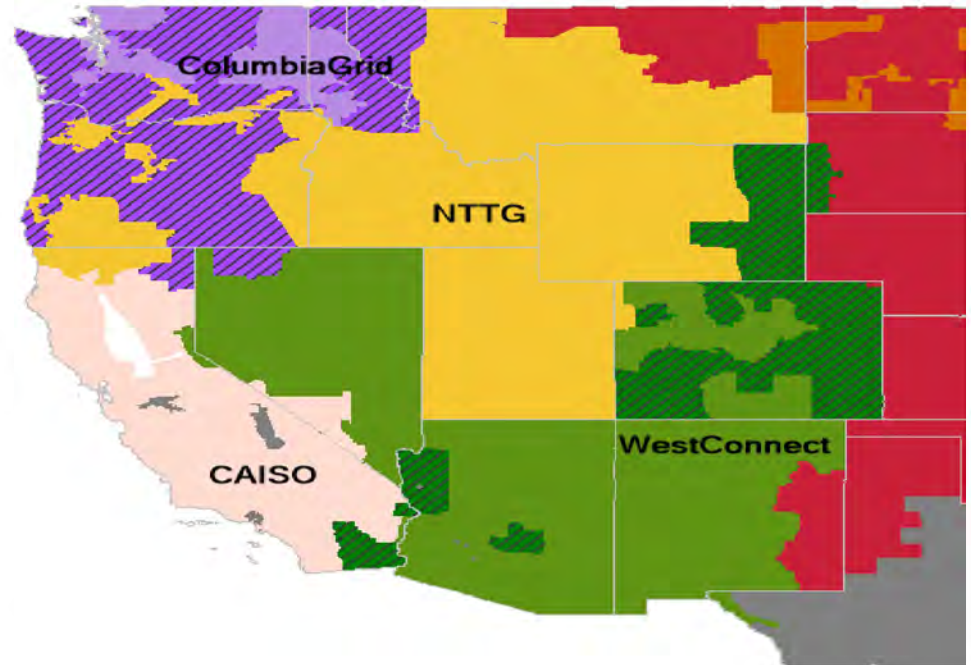


Regional Transmission Planning



- FERC Order 1000 requires participation in regional transmission planning group

- Columbia Grid and Northern Tier Transmission Group Merged to form NorthernGrid
- NV Energy has been participating in WestConnect and just received approval from FERC and the PUCN to join NorthernGrid
 - Emphasis on improved ties to the north and east – take advantage of Greenlink
 - NV Energy has strong interconnections in the south but no available transfer capability in the north
 - Seek resources that compliment solar through diversity with hydro and wind resources





Multi-Attribute Market Initiatives

Western Markets Exploratory Group



- Announced on October 5, 2021 – A group of western utilities exploring a staged approach to new market services, including day-ahead energy sales, transmission system expansion, and other power supply and grid solutions consistent with existing state regulations. Identify market solutions to achieve carbon reduction goals while supporting reliable, affordable service for customers
- Discussions are in the early stages and focused on developing long-term solutions to improve market efficiencies in the West. That includes incorporating lessons learned from existing regional markets as well as other efforts across the West
- The members are in the process selecting a facilitator / project manager with experience in organized energy markets and familiar with the Western Interconnection for development of proposed structure

Western Markets Exploratory Group members by number of electricity customers

Power supplier	Service states	Electricity customers
PacifiCorp	• Utah • Oregon • Wyoming • Washington • Idaho • California	2,000,000
Public Service Co. of Colorado	Colorado	1,500,000
NV Energy Inc.	Nevada	1,500,000
Arizona Public Service Co.	Arizona	1,300,000
Puget Sound Energy Inc.	Washington	1,200,000
Salt River Project	Arizona	1,093,000
Portland General Electric Co.	Oregon	908,000
Idaho Power Co.	Idaho, Oregon	587,000
Seattle City Light	Washington	460,000
Tucson Electric Power Co.	Arizona	436,000
Black Hills Energy	Colorado	96,000
	Total	11,080,000

Additional members (not included in table)

- Los Angeles Department of Water and Power
- Black Hills Energy
- Platte River

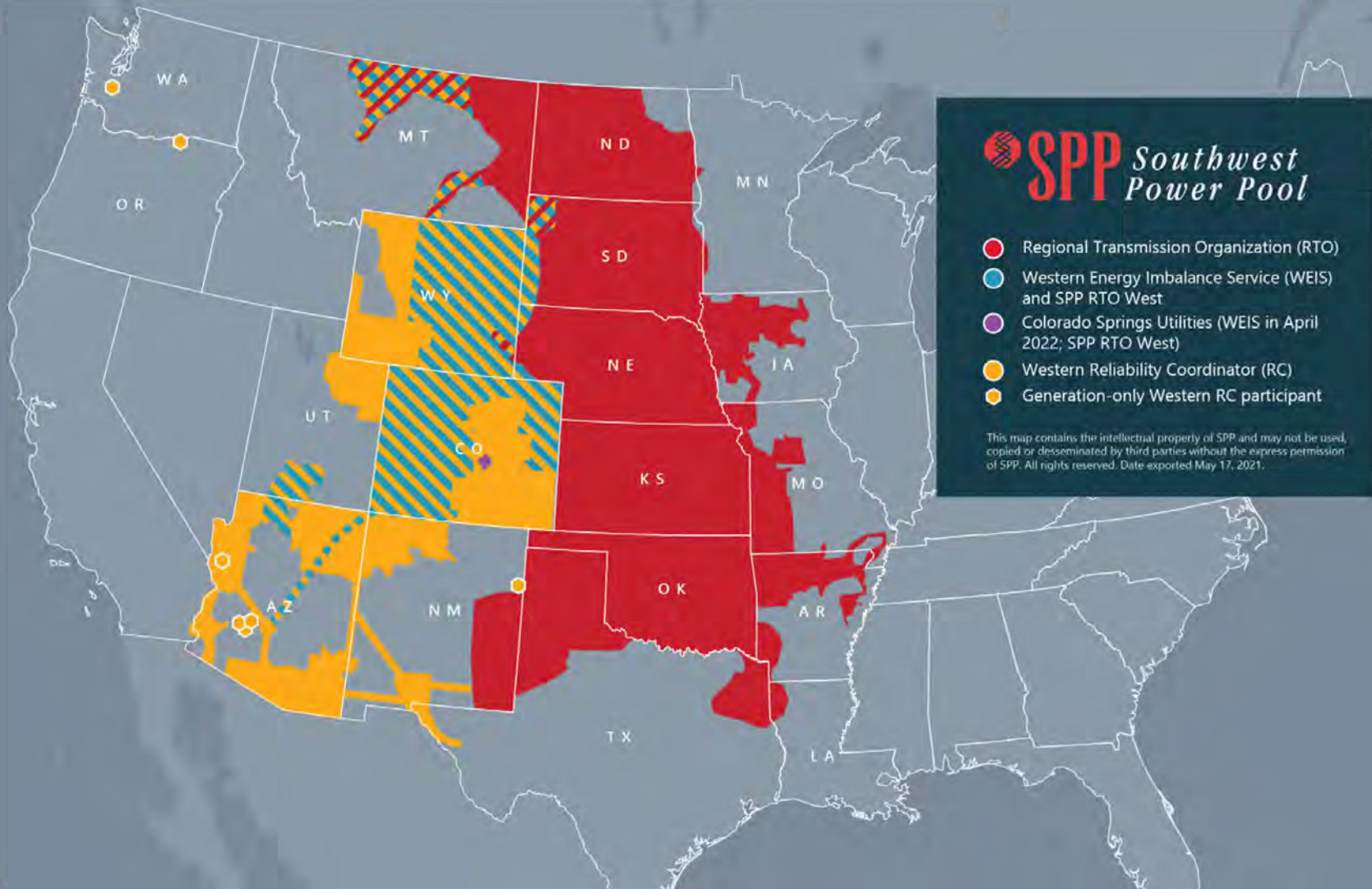
As of Oct. 5, 2021.

Electricity customer figures are estimates.

Platte River Power Authority is not included because it is a government institution that provides electricity generation and transmission services to its owner communities.

Sources: S&P Global Market Intelligence; company websites

SPP Market Expansion





- Imbalance market started February 2021
- Potential RTO Expansion in March 2024
 - Basin Electric Cooperative
 - Tri-State G&T
 - Deseret
 - Municipal Energy Agency of Nebraska
 - WAPA Upper Great Plains
 - WAPA Rocky Mountain
 - WAPA Colorado River Storage Project
 - Colorado Springs Utilities



OPTIONS FOR EVOLVING WESTERN MARKETS

Current path?



RTO?



A new option: **MARKETS+**



Greenlink Nevada Transmission Project



- **Greenlink West**

- Fort Churchill to Northwest 525 kV
- Northwest to Harry Allen 525 kV
- Northwest substation expansion
- Amargosa and Esmeralda 525/230 kV collector substations

- **Greenlink North**

- Fort Churchill to Robinson Summit 525 kV
- Lander 525/230 kV collector substation

- **Common Ties**

- Fort Churchill 525-345-230-120 kV substation
- Fort Churchill to Mira Loma 345 kV
- Fort Churchill to Comstock Meadows #1 345 kV
- Fort Churchill to Comstock Meadows #2 345 kV

- **Benefits for customers and the state of Nevada**

- Creates access to new areas of the state to develop affordable renewable energy resources
- Facilitates ability to meet Nevada's renewable development and carbon-reduction goals
- Positions Nevada to benefit from renewable energy resource mix when future regional transmission projects interconnect at Robinson Summit
- Strengthens electric reliability for Nevada
- Aligns with long-term statewide economic growth both in northern and southern Nevada
- Positions Nevada as energy leader in western U.S.





Questions ?