Western Area Power Administration

Discussion on Markets

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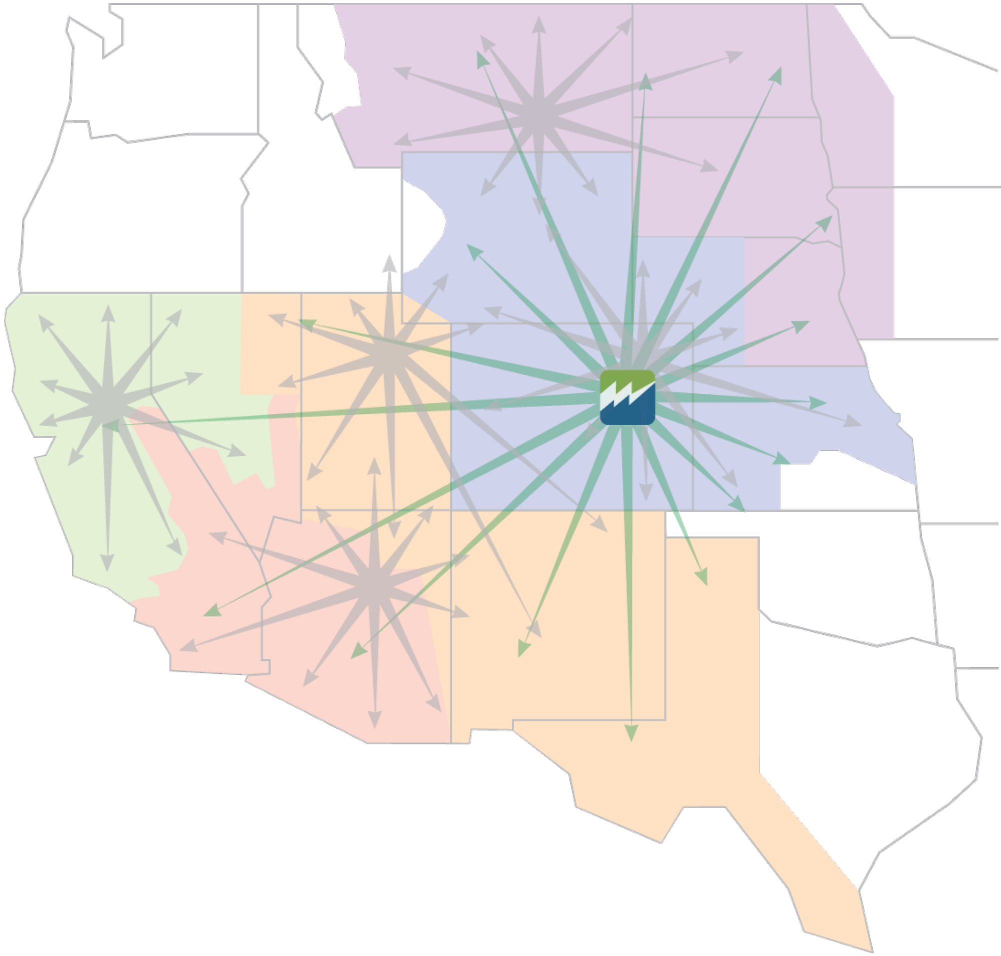
WAPA’s Concerns

- Statutory requirements
- Each region has unique legislation and needs that must be addressed on case-by-case basis
- Cost



WAPA's Interest

- WAPA's significant transmission system
  - More than 17,000 circuit miles
  - 15 states
  - Among top 10 in the country
- Expanding geographic scope of markets
- Expanding number of participants
- Increasingly limited trading partners

Industry Trends: Customer Survey

- Industry driven by:
  - Convergence of technology
  - Rates
  - Customer engagement
  - Regulations
- Key trends:
  - Regulatory burdens / environmental concerns
  - Cyber
  - Coal plant closures
  - Aging infrastructure / Asset Management
  - Transmission reliability

Key Take Away

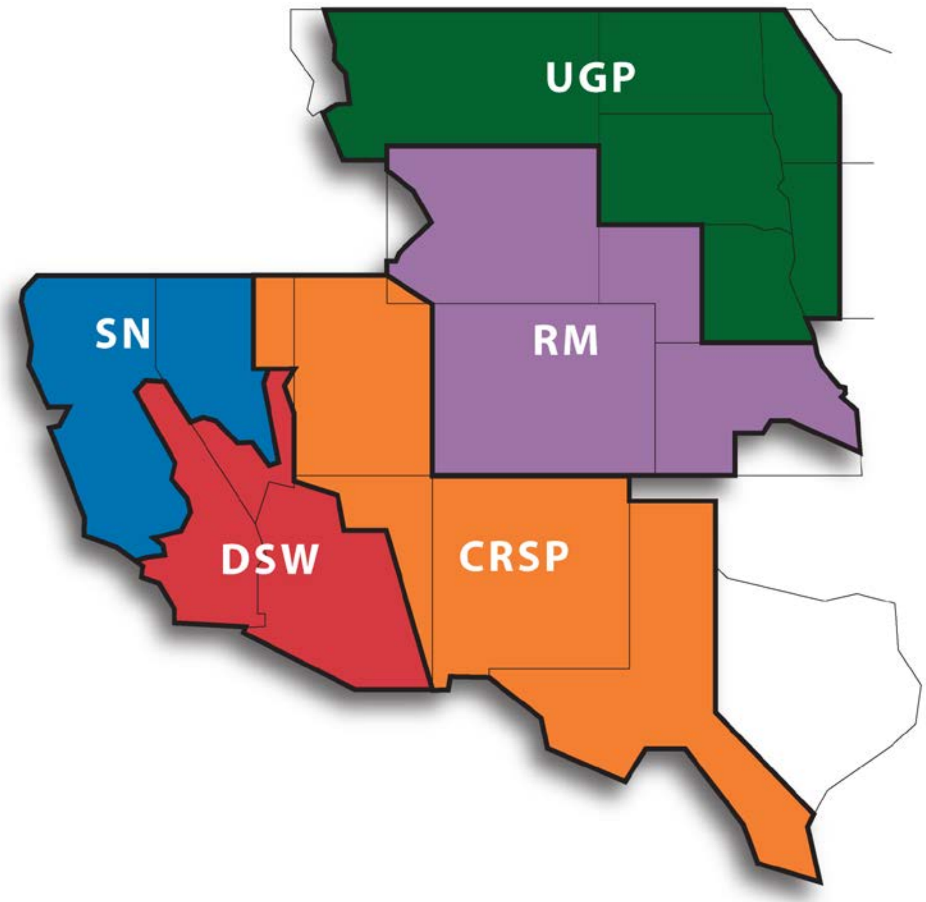
Each region has unique legislation and needs that must be addressed on case-by-case basis.

Customer engagement is critical.

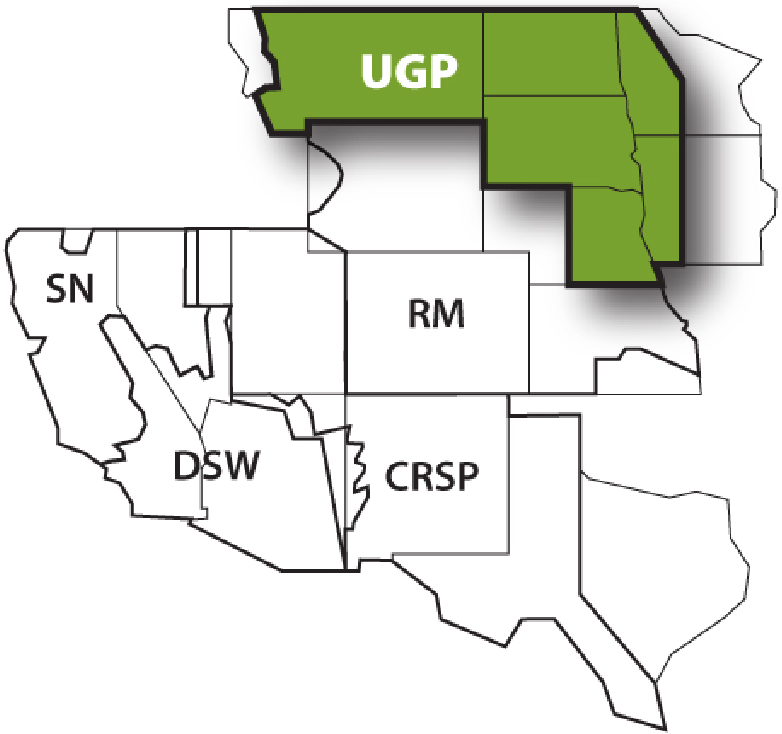




WAPA’s Five Regions

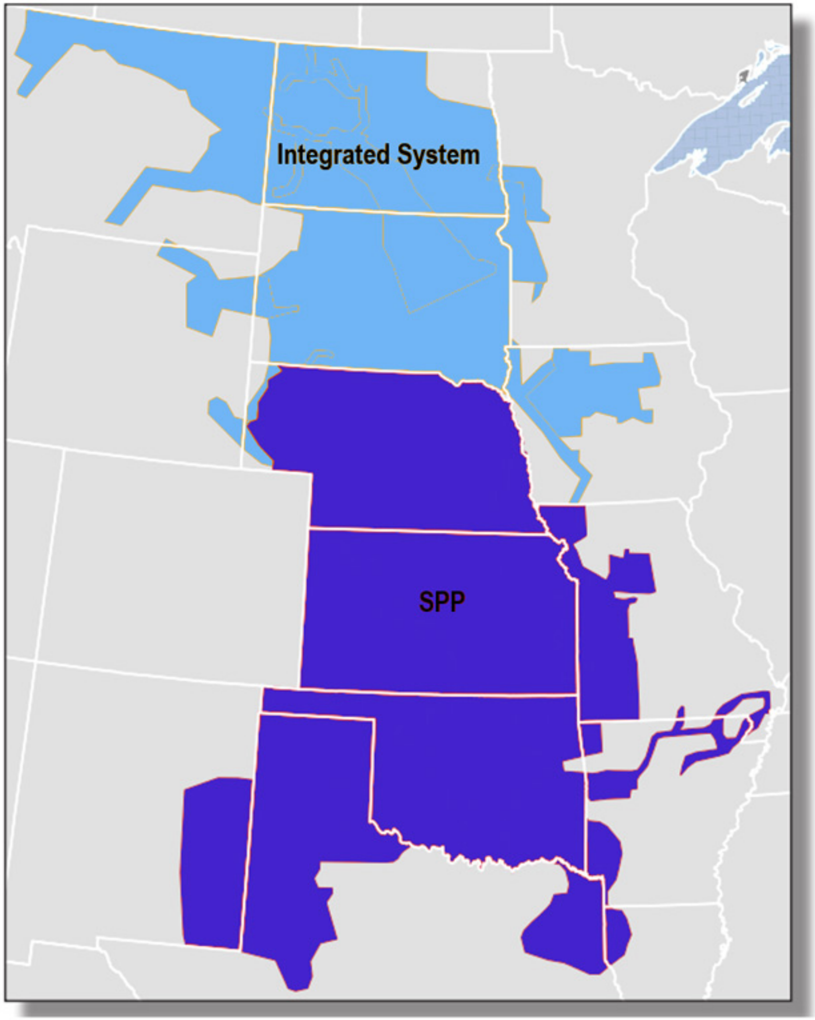


Upper Great Plains Region



Joining Southwest Power Pool

- Joined SPP October 1, 2015
- SPP provides greater flexibility Creates more options for buying and selling
- Reduces constraints in delivering power
- Helps keep costs low for customers
- Alternate Operations Study $11.5 M net benefits predicted initial year savings/cost avoidance
- Savings estimated to be greater than the AOS



Source: SPP

Desert Southwest Region

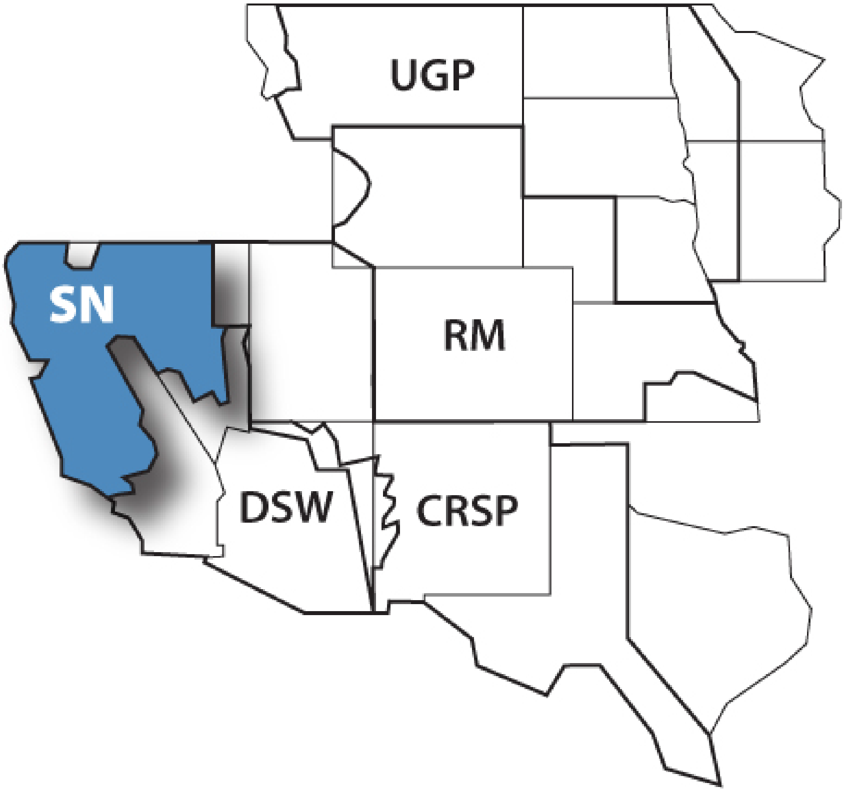
DSW Market Update

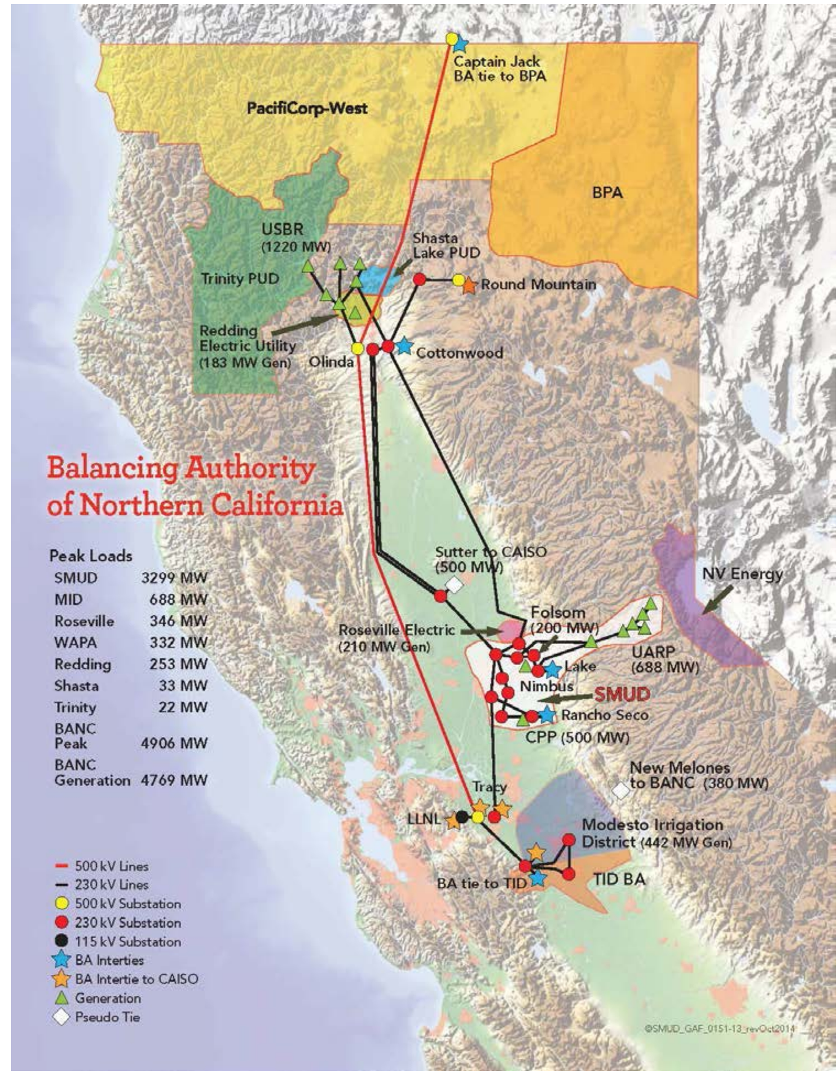
- WAPA CAISO EIM participation not good fit (2013)
  - Based on Argonne study
  - Little energy imbalance
- Since 2013, significant growth in participation in markets in the Southwest
- Growth presents potential for new opportunities as well as costs
- Recognized need to re-evaluate costs/benefits: EIM options or alternatives
- Effects of existing bi-lateral markets in Southwest
- Effects on regional grid operations

Exploring EIM Alternatives

- DSW exploring and analyzing existing markets and EIM alternatives
- Participation in EIM or alternative must provide value for DSW customers
- Ultimate Objectives: Determine any customer benefits of EIM or potential alternatives
  - Weigh opportunities for market participation
  - Evaluate operational benefits, including renewable integration
  - Provide stakeholders and customers with thorough analysis of all options

Sierra Nevada Region





Balancing Authority of Northern California

Slide from BANC's presentation at WAPA's June 30 Markets Meeting

Evaluation Status

- Several rounds of benefit and cost analyses are complete
  - Sensitivity runs being initiated (hydro year, price volatility, RPS levels)
- Benefits – gross benefits for all 4 participants & WAPA-SNR
- Costs
  - Implementation costs – in range of prior EIM entities
  - Ongoing costs – high compared to prior EIM entities due to BANC not being one vertically integrated entity
- Still evaluating results to determine if/what scenarios would provide net benefits
- BANC initial decision-making planned for late August
- WAPA-SNR not BANC member and will have separate decision-making process
- If BANC proceeds, most likely looking at 2019 Go Live

BALANCING AUTHORITY OF NORTHERN CALIFORNIA

A JOINT POWERS AUTHORITY BETWEEN

Modesto Irrigation District | City of Redding | City of Roseville | Sacramento Municipal Utility District | City of Shasta Lake | Trinity Public Utility District

6001 S Street MS D109 Sacramento CA 95852-1830

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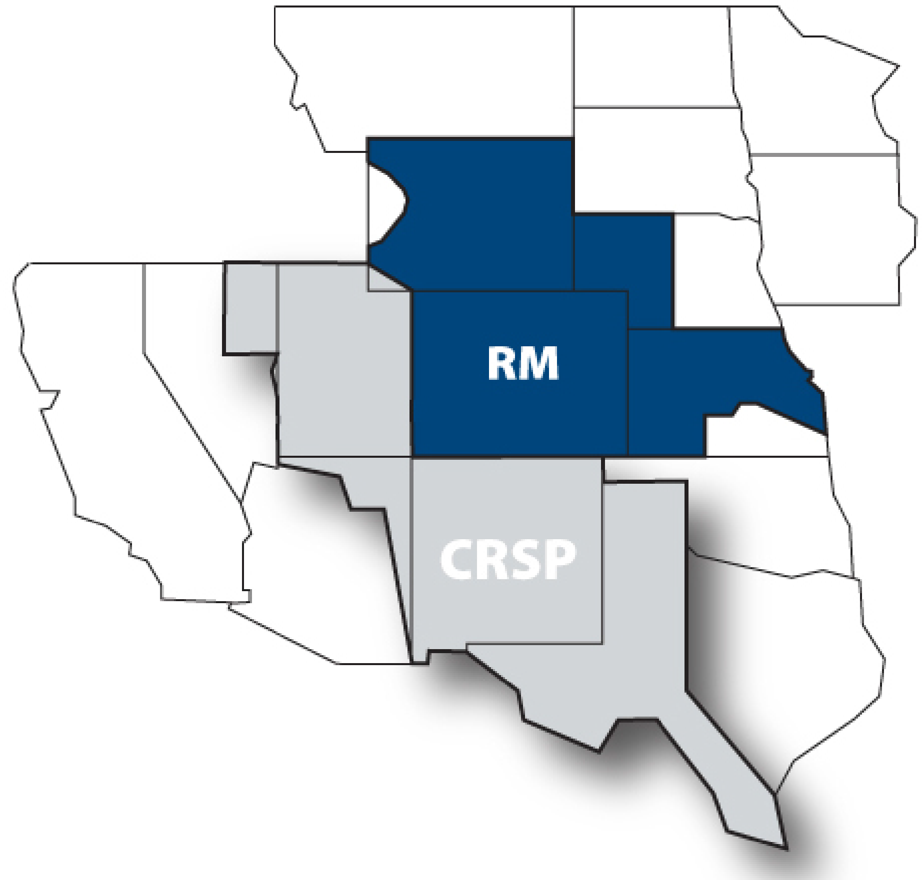
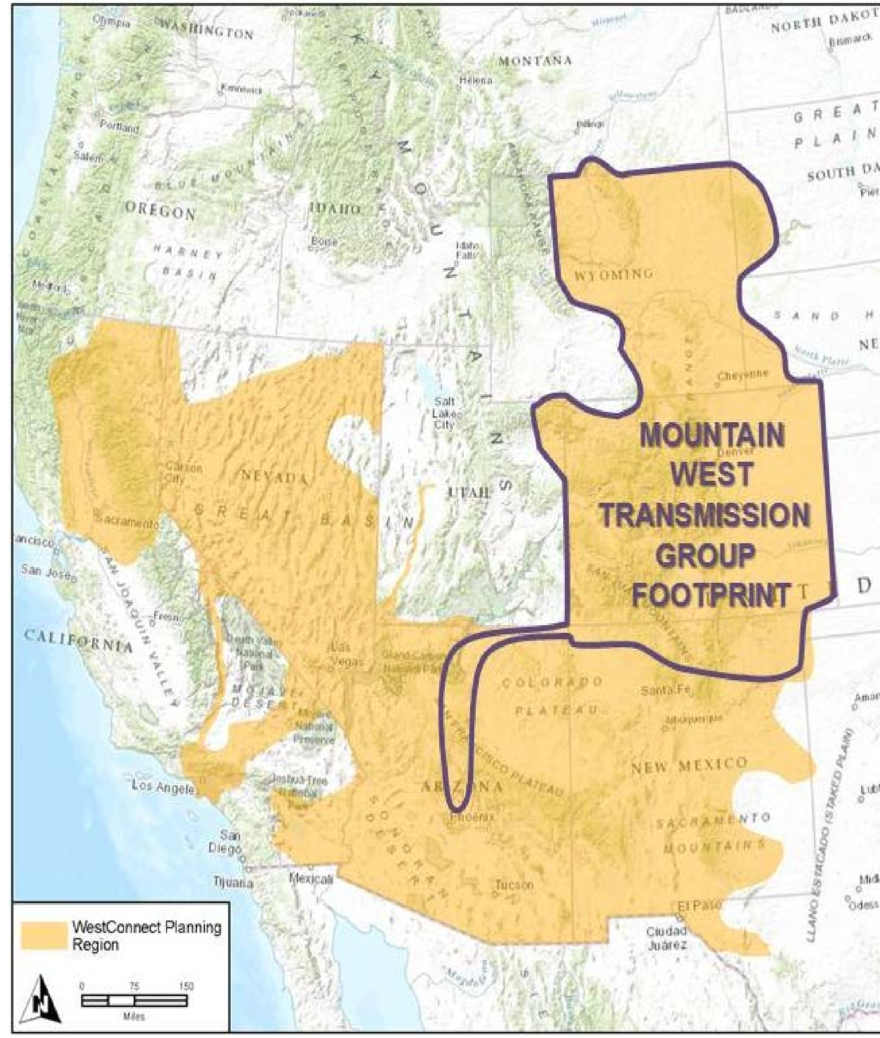
Rocky Mountain and Colorado River Storage Project

- RM/LAP and CRSP participating in Mountain West Transmission Group
- CRSP Merchant handles both LAP and CRSP
- LAP SPP Market Participant in SPP since 2015



MWTG

- Goal – Create a single multi-company transmission tariff and explore “Day 2” market alternatives
- MWTG TSPs include: two IOUs, two municipals; two REA G&Ts; two Federal PMA projects
- MWTG members are a sub-set of the WestConnect planning region members and are members of the Colorado Coordinated Planning Group (CCPG)
- Currently includes seven parties with nine transmission tariffs



Participating Transmission Owners

- Current Transmission Owners*
  - Basin Electric Power Cooperative (BEPC)
  - Black Hills Corporation (BHC) including its three affiliates
    - ✓ Black Hills Power, Inc. (BHP), Black Hills Colorado
    - ✓ Electric Utility Company, LP (BHCE) and Cheyenne Light
    - ✓ Fuel & Power Company (Cheyenne)
  - Colorado Springs Utilities (CSU)
  - Platte River Power Authority (PRPA)
  - Public Service Company of Colorado (PSCo)
  - Tri-State Generation and Transmission Association, Inc. (Tri-State)
  - WAPA
    - ✓ Loveland Area Projects (LAP)
    - ✓ Colorado River Storage Project (CRSP)

**Other Owners may join prior or post start-up* (marked with *)

MWTG 2013 Statistics

Transmission Owner	Gross Transmission Plant ($)	Net Transmission Plant ($)	Annual Transmission Revenue Requirement ($)	Miles of Transmission
Basin Electric Power Cooperative Westside	52,126,841	19,108,267	4,535,874	209
Cheyenne Light Fuel & Power	41,027,108	35,981,808	6,848,030	45
Black Hills Colorado Electric Utility	333,880,142	146,938,581	12,452,172	581
City of Colorado Springs Utilities	140,898,577	67,284,691	21,957,844	232
Common Use System (BEPC & BHC)	243,548,935	185,304,004	29,846,727	983
Platte River Power Authority	348,969,285	266,337,678	38,277,136	370
Western CRSP	651,271,471	391,945,017	58,386,041	2,325
Western LAP	550,045,450	286,761,337	61,866,058	2,508
Tri-State Generation and Transmission Association	766,276,122	431,085,996	96,781,507	4,660
Public Service Company of Colorado	1,616,197,083	1,265,799,495	208,498,664	3,782
Total	$ 4,744,241,013	$ 3,096,546,874	$539,450,053	15,694

Mountain West Benefits

- One transmission provider
  - De-pancaking of transmission charges
  - Foundation for an organized market
  - All load is network load of MWTG
  - Single determination of ATC/AFC
    - ✓ Transition away from contract path to flow-based
  - Improved transmission planning and interconnection processes
    - ✓ Will comply with Order No. 1000
    - ✓ Avoid duplication of facility investments
    - ✓ One point of contact for system interconnections
    - ✓ Additional siting opportunities for new resources
  - May assist in addressing future regulatory challenges

MWTG - Significant Work to Date

- Strong cooperative effort - group has held over 50 meetings
- Significant success with rate design and cost shift mitigation, despite multiple failed attempts at regional tariffs in the past
- Developed and signed an MOU summarizing work to date
- Developed a Request for Information for RTO/ISO response
- Currently conducting a Market Study to evaluate resource side benefits of having a joint tariff as well as a joint tariff with a full Day-2 market
- On-going outreach in various forums

MWTG Rate Design

- Network customers pay the zonal rate in which their load sinks
  - Owners in zone retain revenue for zonal network load
- 8 zones
  - Each transmission owner is a zone, except Tri-State
  - Tri-State facilities are split between Western LAP and PSCo zones
  - Cheyenne facilities are not recovered under the Tariff
- Single Regional Through and Out Rate (RTOR) applied to PTP
  - RTOR = Total MWTG ATRR divided by Total MWTG load
  - Revenues allocated based off of ATRR and MW-Mile split, after mitigation
- Cost shifts largely mitigated

MWTG Request for Information

- Issued to SPP, CAISO, MISO and PJM in May
- Obtain information and cost estimates from qualified entities
  - Asking entities to provide information on a wide range of services from Transmission Tariff Administrator to Full Market/RTO participation
    - ✓ TSP services
    - ✓ Ancillary services, losses, and other provisions
    - ✓ Interconnection processes
    - ✓ Planning concepts
    - ✓ Market operator
- RFI is one of multiple sources of information to assist the group in consideration of path forward

MWTG Markets Study

- Group is conducting a two-phase production cost study
- Executed study agreement, NDA and completed phase I
- Study Current Year 2016 (Phase I)
  - Status quo with nine tariffs
  - Remove pancaked transmission charges to simulate a joint tariff
  - Add full Day-Ahead market structure
- Future Year 2024 (Phase II)
  - Multiple cases, still in development

MWTG Outreach (Started and Ongoing)

- State Regulatory Authorities
- Western outreach to its preference customers
- Each party’s outreach to its constituents
- Other stakeholder organizations
- RTOs
- FERC

MWTG Key Decisions

1. **Establish Joint Tariff?**
   - Yes – Foundation for Market
   - No – Energy Market option

2. **What level of Market?**
   - No Market
   - Energy Only Market
   - Full Market

3. **Which RTO/ISO?**
   - Membership
   - Contract Relationship

Analysis Inputs:

1. MWTG Transmission Cost Study
2. MWTG RFI
3. MWTG Market Study
4. Analysis of Impacts:
   a. Staffing
   b. IT (Meters, Settlements, EMS, etc.)
   c. Ancillaries
   d. Compliance
   e. Pancaked Losses
   f. Planning Reserve Margin
   g. Marketing Plan
   h. RC
   i. Governance

MWTG Decision Timeline (Estimated)

Now through Fall:	Analysis
January 2017:	MWTG Agreement on Direction to Pursue
Winter 2017:	WAPA FRN Proposing Direction to Pursue
Spring 2017:	WAPA Customer Meeting(s) / Comment Period
Summer 2017:	WAPA Decision
2018/2019:	Implementation

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