WAPA: Who we are

Flood Control Act of 1944

“... encourage the most widespread use ... at the lowest possible rates consistent with sound business principles ...”
WAPA: What we do

- Federal Hydropower
  - Market 10,503 MW of power from 56 dams
  - Buy and sell power to provide firm electric service

- Transmission System & Service
  - 17,000+ miles of transmission lines
  - Operate 3 balancing areas
  - 15-state operating region

- Transmission Infrastructure Program
  - Separate $3.25 B borrowing authority
  - Projects must facilitate renewables
  - Projects must have a terminus in WAPA’s footprint
Why markets at all?

Potentially efficient, but ...
Theoretically ...

Markets make for equal partners reducing friction in trading of equal electrons.
Cost of electricity vs. inflation

Average retail price of Colorado electricity (all sectors) 2001-2014

The increasing cost of energy in Colorado 2001-2014

Source: Energy Policy Center, Feb. 15, 2016
## Market challenges for WAPA

### Western Area Power Administration – FY 2017 Composite Rates

And Comparable Market Rates – long-term and spot/peak pricing (wholesale – not retail)

<table>
<thead>
<tr>
<th>WAPA region</th>
<th>WAPA’s Long-Term Firm Composite Rate &lt;br&gt; Weighted Average for region ($/mWh)</th>
<th>Average Long-term Market –Based Electricity Prices ($/mWh)</th>
<th>Average On-Peak Spot Market-Based Electricity Prices &lt;br&gt; (no transmission) ($/mWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado River Storage Project Management Center</td>
<td>29.43</td>
<td>37.00 to 73.51</td>
<td>30.89</td>
</tr>
<tr>
<td>Desert Southwest</td>
<td>18.42</td>
<td>42.92</td>
<td>26.80</td>
</tr>
<tr>
<td>Rocky Mountain</td>
<td>29.90 + .66 drought adder + 36.56</td>
<td>57.70 to 73.53</td>
<td>34.84</td>
</tr>
<tr>
<td>Sierra Nevada</td>
<td>31.60 +15.59 CVPIA environmental assessment = 47.19</td>
<td>30.81</td>
<td>33.64</td>
</tr>
<tr>
<td>Upper Great Plains</td>
<td>21.42 + 6.83 drought adder = 28.25</td>
<td>33.22 to 61.33</td>
<td>24.03</td>
</tr>
</tbody>
</table>
Making market decisions

• Have studied RTO participation since 1990s
• Began evaluating SPP in 2011
  • Examined three options
  • Six criteria across each option and risk
    • Trade benefit
    • Administrative costs
    • Transmission expansion
    • Capacity benefits
    • IS transmission revenue
    • Drive out impacts

• Joining offered the least risk and most benefit to customers
• Same matrix resulted in decision NOT to join CAISO (2015)
Southwest Power Pool
Change is upon us

WIND-PENETRATION RECORD
54.22% AT 00:55
ON MARCH 19, 2017
Oahe generation
Oahe generation

April 9th Comparison for Oahe Generation

MWs

4-second data for hours ending 1 - 24

2015  2016
Oahe generation
Mountain West

- Formed 2013
- Evaluating options
- Announced decision to pursue talks with SPP
- Making decision within 60 days
- If applicable, market implementation 2019
Essential Reliability Services
Change brings opportunities

- Infrastructure considerations
- Increased regulation
- Intermittent resources
- Varying hydro production
- Customer-side resources
- Changing markets
- Security
Fundamental change

The challenge for the utility of today is not only what is real but what is perceived as real.
Radical thoughts ...

- kWh is dead
- All-you-can-eat electricity
- Time-of-purchase rates NOT time-of-use rates
- Utility is the network provider
- Markets replace IRPs
Economic challenge

How can we manage in a Twitter–centric world?
What are we doing about it?
Shift in strategic thinking

• Broader perspective
• Data-driven decisions
• Industry impacts to customers
What that looks like

- 10-year planning horizon
- Cybersecurity
- Lifecycle considerations
- Physical security
- Asset Management
- Continuous Process Improvement
Modernizing assets

WAPA-wide 10-year Capital Investment Plan
FY 2017-2026 estimates as of October 2016

- Transmission Lines
- Buildings and Programmatic
- Sub Control, Protection & Metering
- Mobile & Heavy Equipment
- Comm Systems
- Substations
- PY TYP Apr Update, '16-25

Fiscal year

$ in millions

$0 $50 $100 $150 $200 $250

Key takeaways

Focus on value and business excellence.
Continue delivering on mission.
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