Future of the Bulk Electric System

National Academy of Sciences

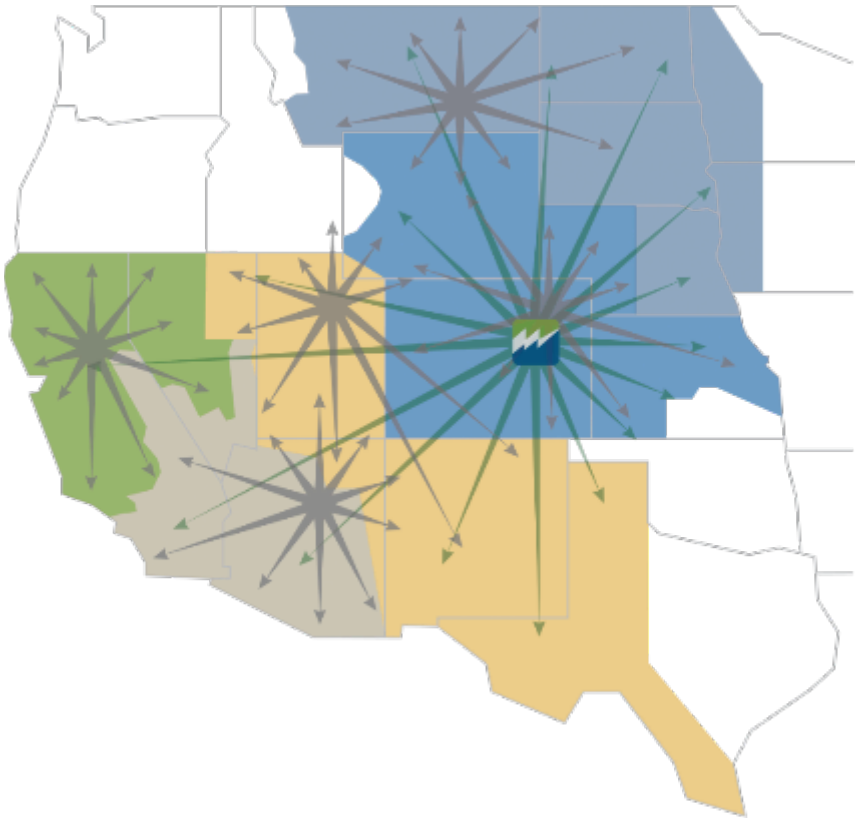
June 2, 2020 | Webinar

Mark A. Gabriel
Administrator and CEO

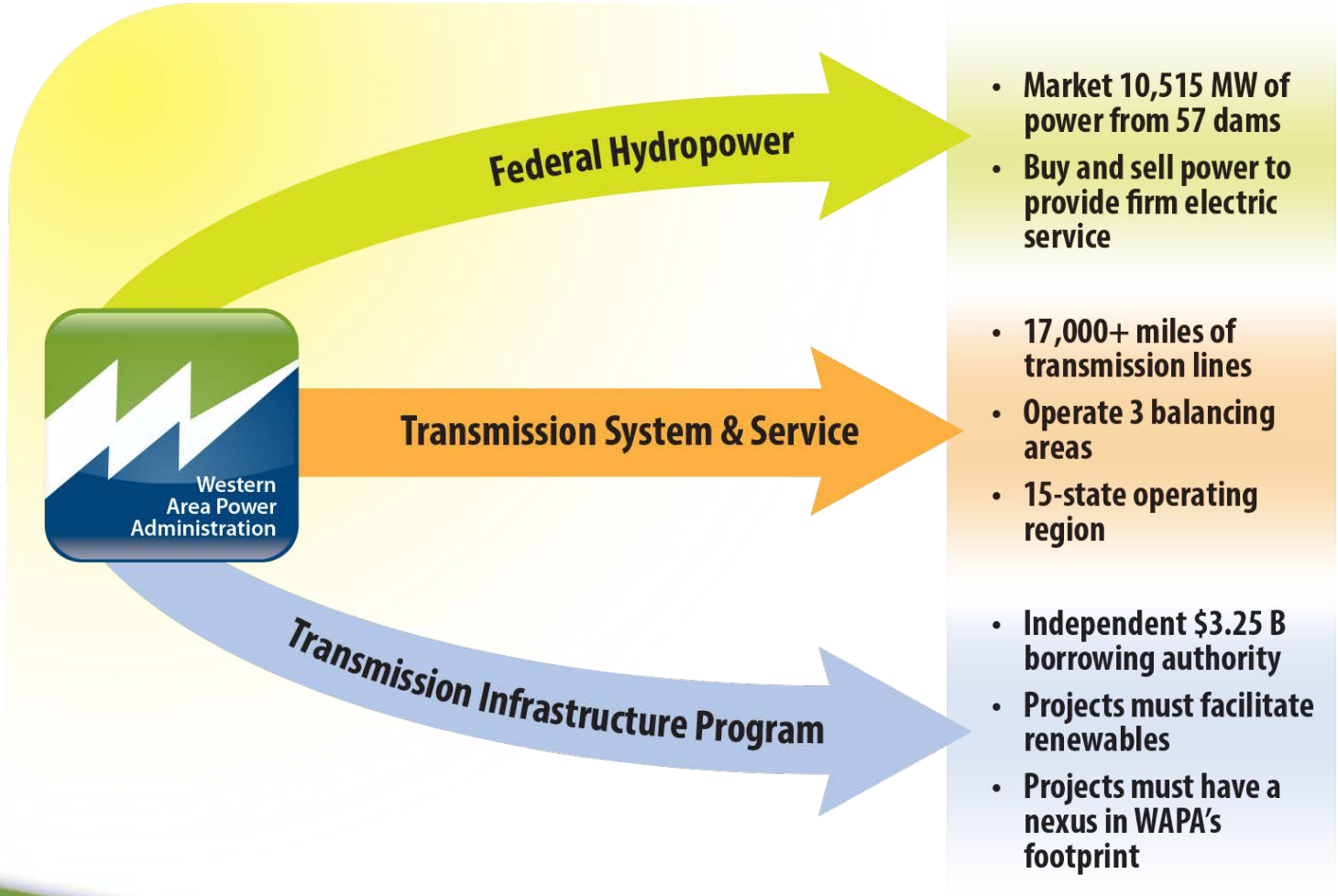
Western Area Power Administration

Who we are

- Serve 40 million Americans
- 15-state footprint
- 1.4 million square miles
- 49 offices
- ~700 customers
- Top-10 largest transmission utility in country

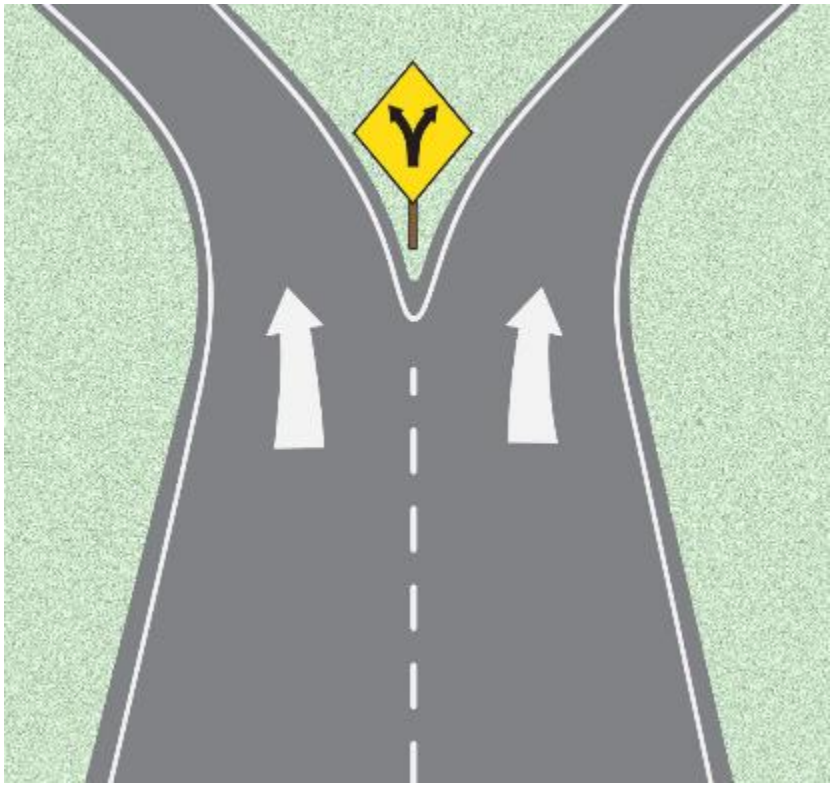


What we do


Federal Hydropower
Transmission System & Service
Transmission Infrastructure Program
Western Area Power Administration
• Market 10,515 MW of power from 57 dams
• Buy and sell power to provide firm electric service
• 17,000+ miles of transmission lines
• Operate 3 balancing areas
• 15-state operating region
• Independent $3.25 B borrowing authority
• Projects must facilitate renewables
• Projects must have a nexus in WAPA's footprint

Challenges in the energy frontier

- Aging Infrastructure
- Intermittent resources
- Varying hydropower production
- More customer-side resources
- Lack of integration
- Carbon/capacity conflict
- Changing markets
- Security



Carbon constraints/capacity conflict

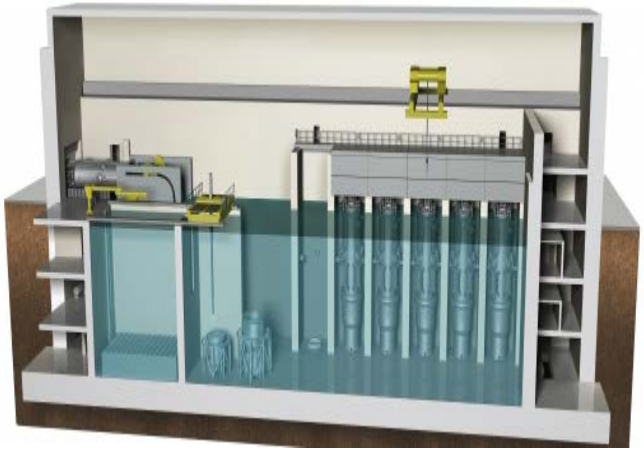
- Demand for new power sources will outstrip capacity
- The physics barrier
- Public perception contrasts the reality system operations
- Renewables are being promoted the only answer
- Renewables create financial challenges

Developed world demand dead? Developing world demand galloping!

Contrasting world views

- Reality of system ops generally ignored
- Sky is falling?
- Sky is not falling?
- Reliability hangs in balance
- Surge in demand may lead to significant shortages
- Timing of regulations affect regions differently
- Belief, not engineering, leads the way

Preparing for the future



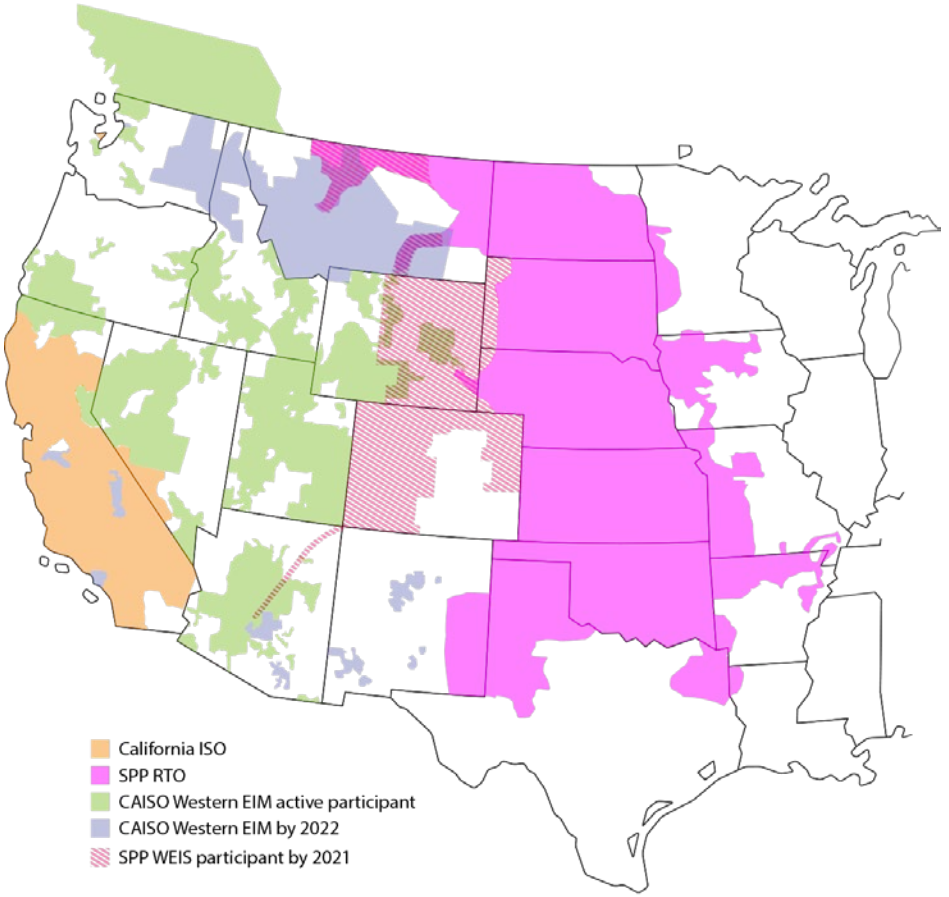
USVI Solar Farm post hurricane

Grid of the future

- Used more in fewer hours
- Different payback models
- Interplay between transmission & communications architecture
- Take advantage of AC-DC ties
- Accommodate new technologies
- Secure against cyber, physical threats

Future of markets

- Widespread agreement future of markets is in the West
- Will these market structures exist in 10 years?
- Planning should consider current complexity of the system and not try to fix that but rather work the edges

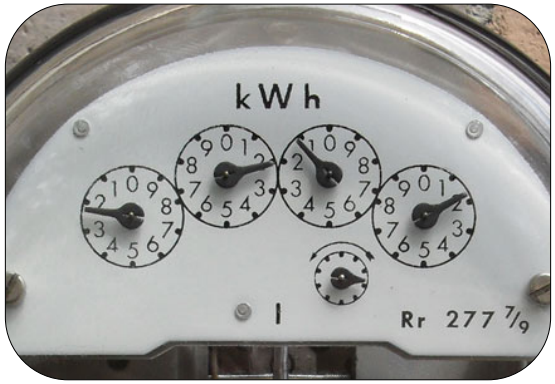


Fundamental change

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

Societal changes

Radical thoughts



The kilowatt-hour is dead

Time-of-purchase vs. time-of-use

All-you-can-eat energy

Key takeaways

The industry is changing at a rapid pace.
There is no microgrid without a macrogrid.
Focus on optimizing existing technologies & assets
Today's markets may not exist in a decade.

Contact/follow me

Mark A. Gabriel
720.962.7705
gabriel@wapa.gov

wapa.gov

@westernareapowr
@MarkAGabriel

Mark Gabriel

WesternAreaPower1

westernareapower

wapa.gov