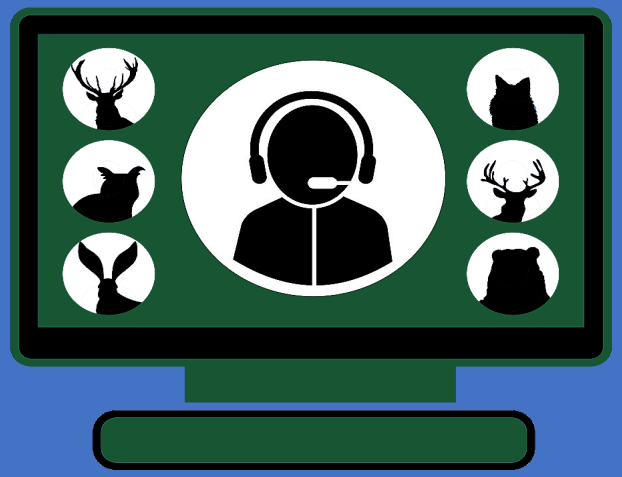
Montana Environmental Information Center



The Quarantine Series

Brian Fadie, Clean Energy Program Director

Montana Renewable Energy 201: A Deeper Dive

2 Topics

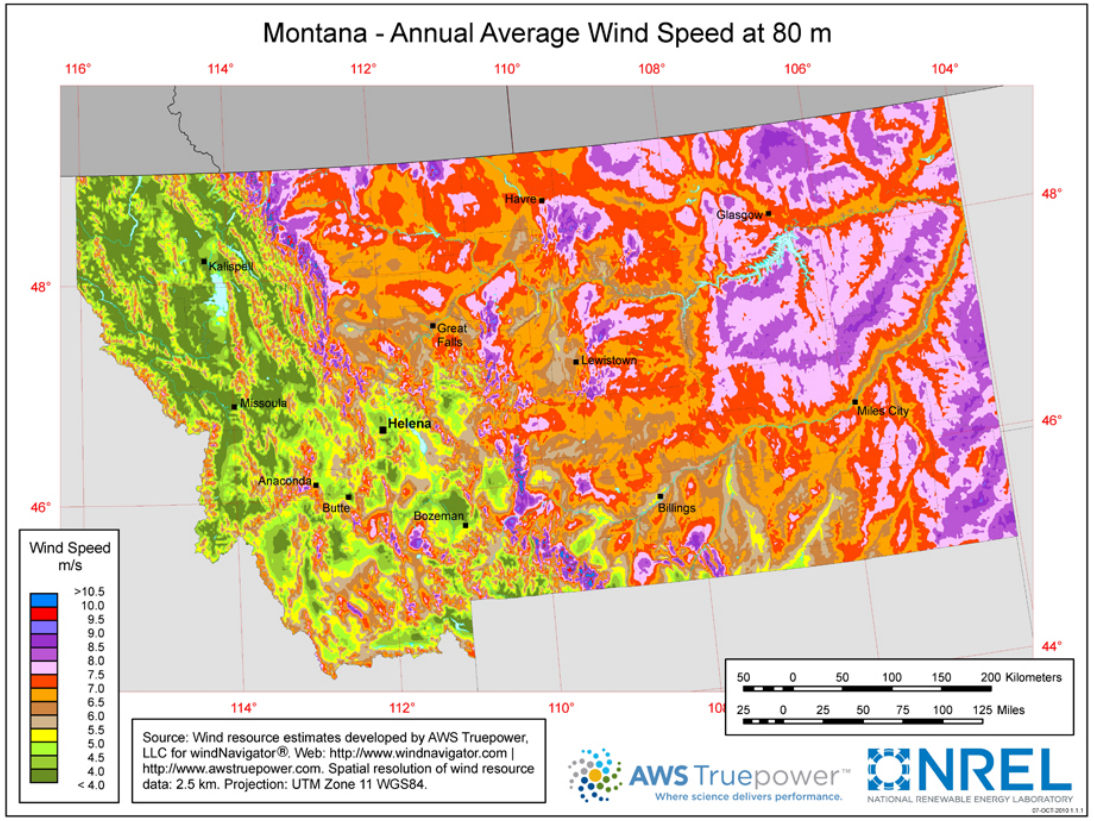
- Montana Wind Competitive Advantage
- Transmission is Key to Reaching Clean Energy Future
  - The Evolving Western U.S. Transmission Grid

MEIC

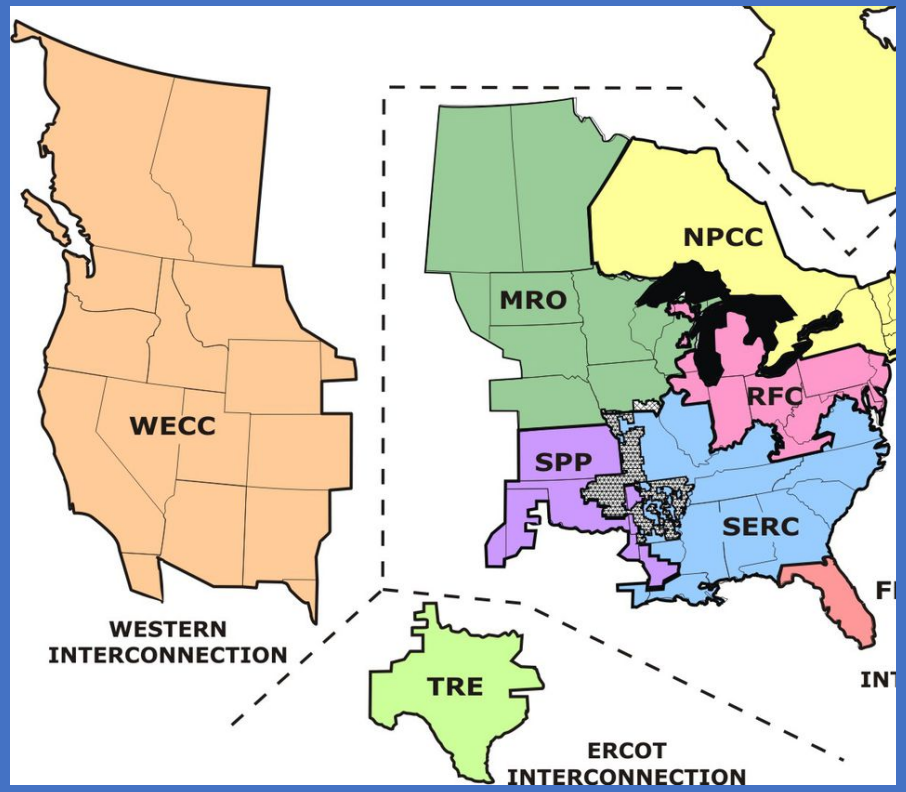
Montana Wind Competitive Advantage

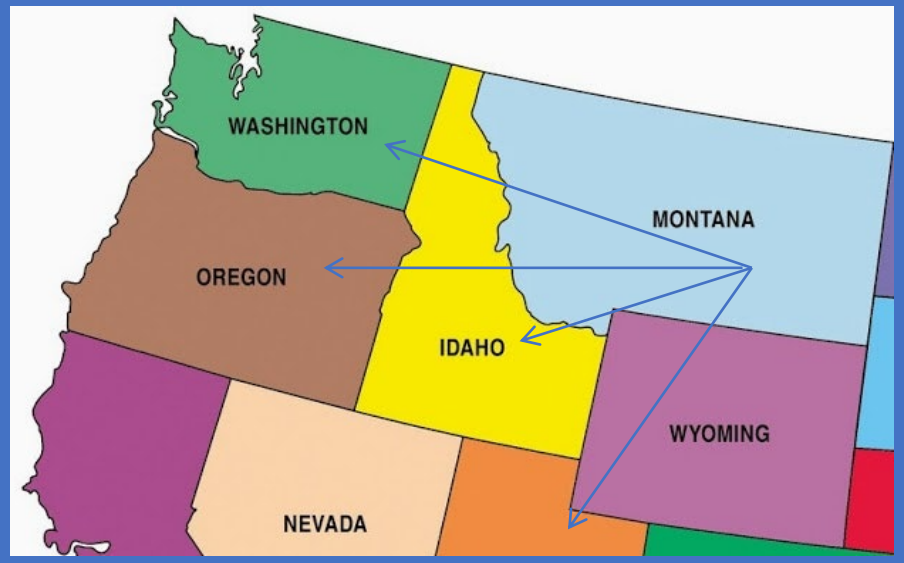
MEIC

Montana Has #2
Wind Energy Potential in USA



U.S. Grid Means Montana Will Export to West and South

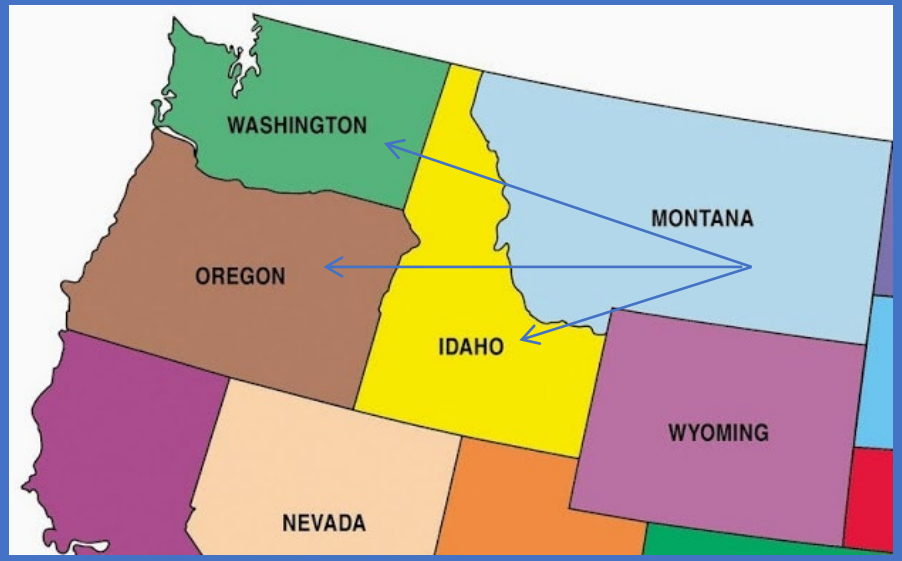




MT's Current Energy Customers Want Clean Energy

Washington
No coal by 2025
100% clean energy by 2045

Oregon
No coal by 2030
50% clean energy by 2040



Idaho
Idaho Power & Avista Corp
100% clean energy by 2045

"The customer is always right!"

Montana Wind Competitive Advantages

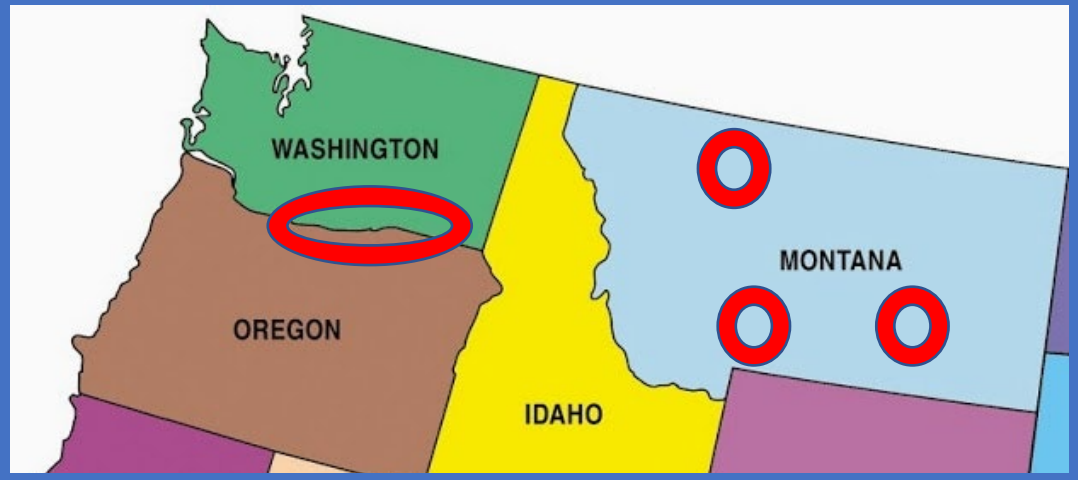
Spion Kop wind farm – east of Great Falls

- Has great production overall, means lower cost
- Oregon and Washington's peak energy demand = winter
- MT wind has strong winter production - better than WA and OR
  - Creates value for MT wind
- Geographic diversity is valuable
  - Want facilities spread out

Geographic Diversity is Valuable

Getting wind from 1 location not as good as…

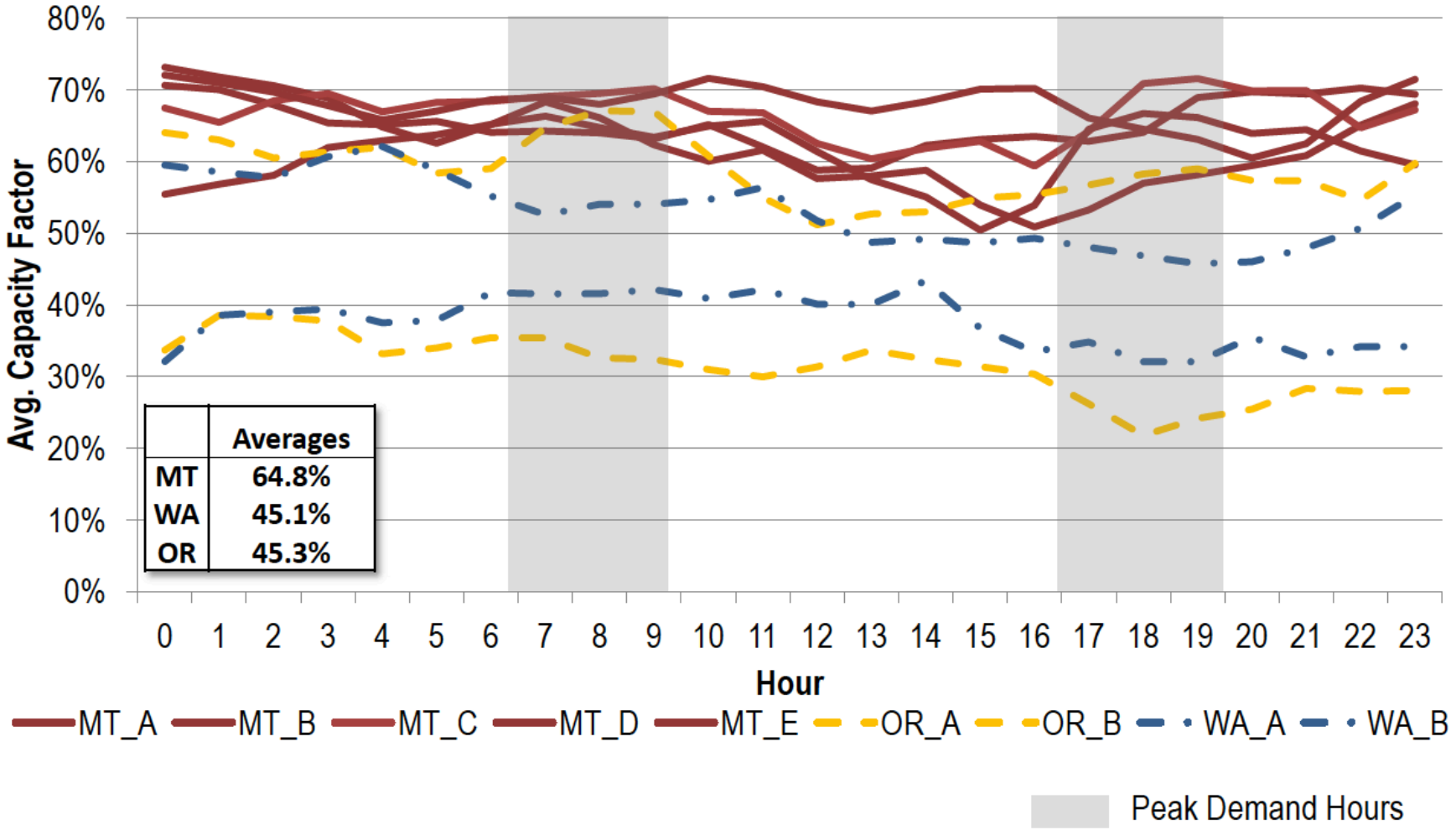
Getting wind from MANY locations



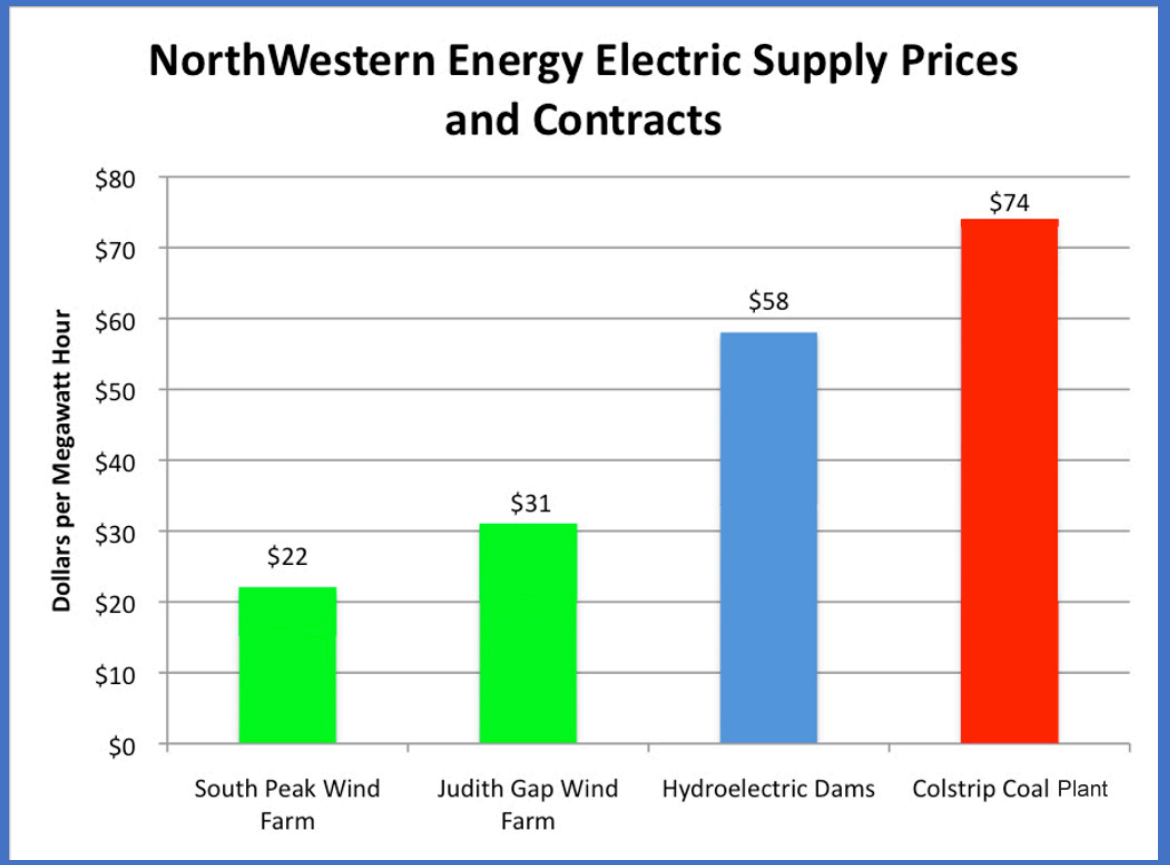
Montana Wind

Oregon & Washington Wind

January 2012
Average Hourly Capacity Factors



Montana Wind Energy is Low Cost



** Prices for out-of-state utilities may vary*

Source: Montana Consumer Counsel (2017)

What Other Utilities Say About Montana Wind

Portland General Electric

2019 Resource Plan

"Montana presents a potentially appealing location for siting wind generating facilities.

Its high average wind speeds suggest generating facilities could have attractive capacity factors [i.e. year round production]. Further, its geographic diversity relative to the current PGE wind portfolio and the seasonal timing of the generation [i.e. winter production] could provide increased capacity contribution benefits compared to other locations."

-PGE 2019 IRP, Page 147

Avista Corp

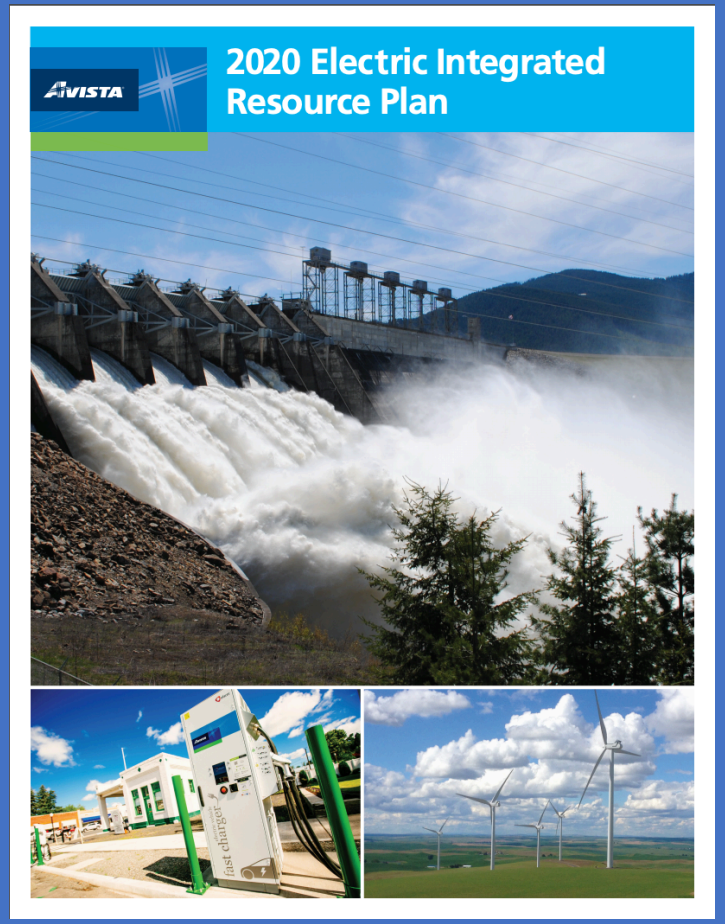

Avista Service Territory
Kettle Falls
Sandpoint
MONTANA
Noxon
Seattle
Spokane
Coeur d'Alene
WASHINGTON
Olympia
Missoula
Othello
Helena
Pullman
Moscow
Clarkston
Lewiston
Goldendale
Stevenson
Grangeville
Portland
La Grande
Salem
OREGON
IDAHO
Boise

Avista Corp

2020 Resource Plan

"The 200 MW Montana wind resource would serve customers by adding potentially low cost clean energy as a contribution to meeting peak winter loads."

"A combination of Montana wind and storage resources meet the 2026 capacity deficits associated with the shutdown of Colstrip…"

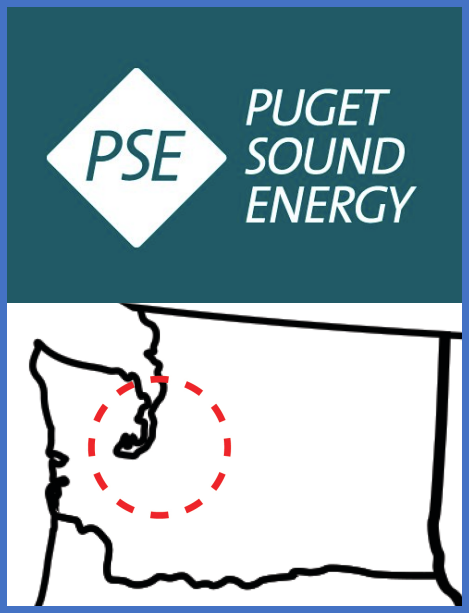


Puget Sound Energy

Request for Proposals (RFP) underway

Press Reports:

- 3 MT wind projects on short-list
- All 200-400 Megawatts
- One on Northern Cheyenne tribal land



MEIC

Transmission is Key to Reaching Clean Energy Future

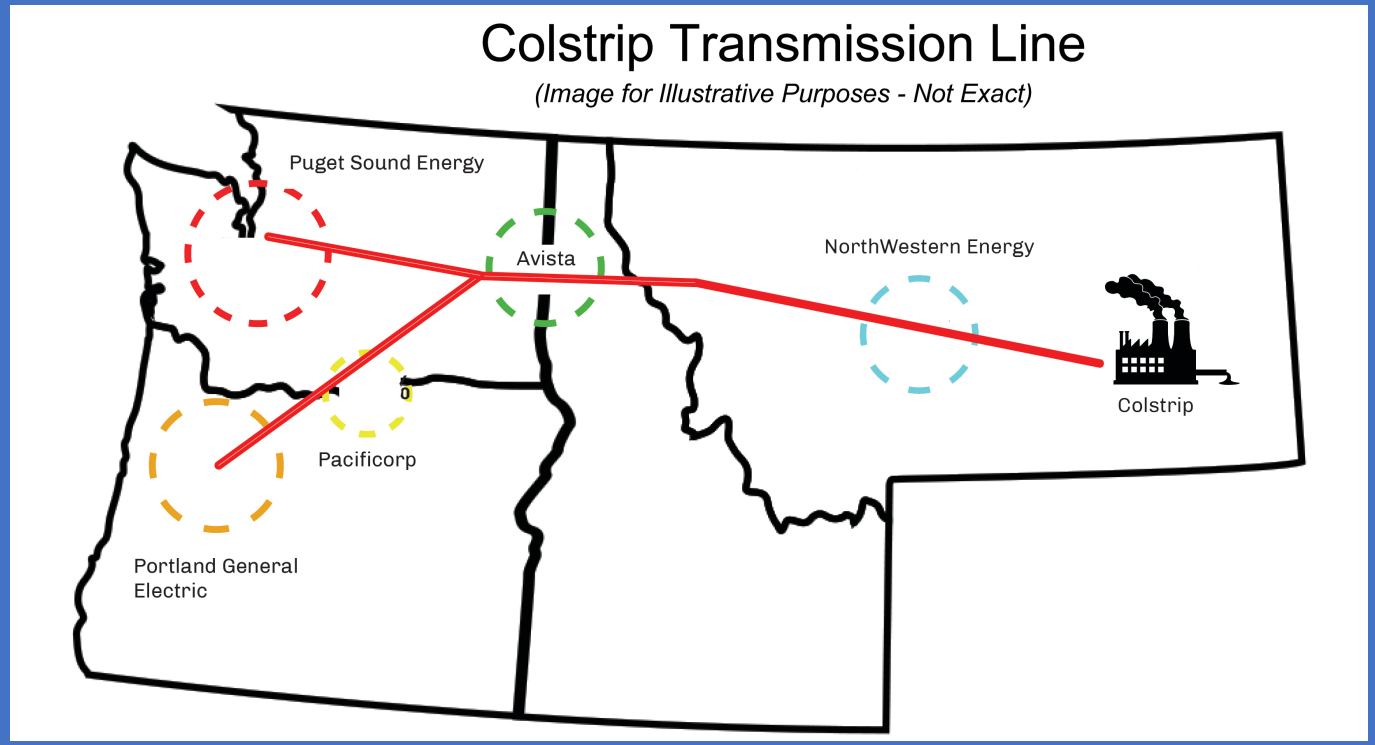
2 Transmission Developments

1. Making efficient use of existing transmission lines

2. Western U.S. grid evolving to enable renewables, save people $

Efficient Use of Existing Transmission Lines

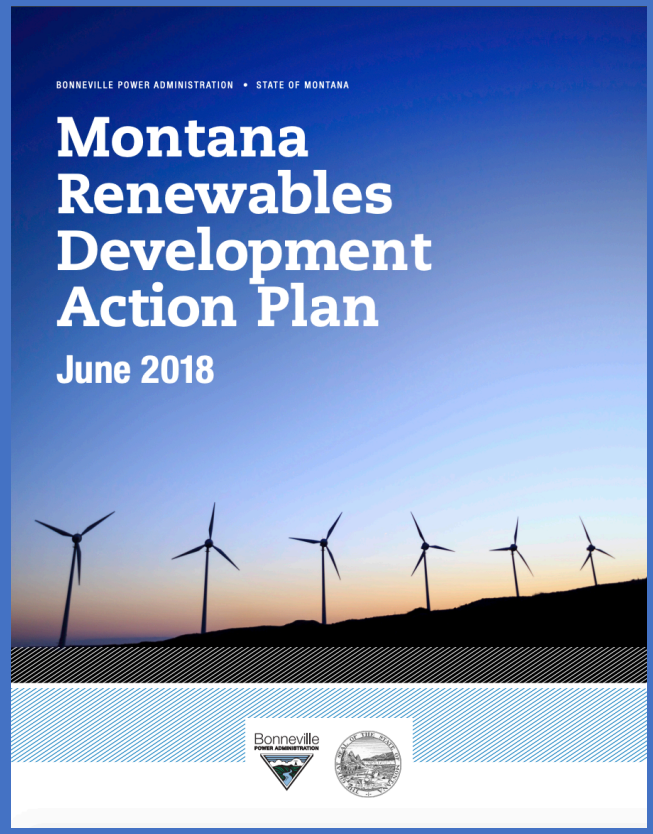
- Building new transmission lines can be challenging, takes time
- Maximizing existing lines helps with near-term development
- Colstrip transmission line can move renewables



Efficient Use of Existing Transmission Lines

Preparing Colstrip Transmission Line for Renewables

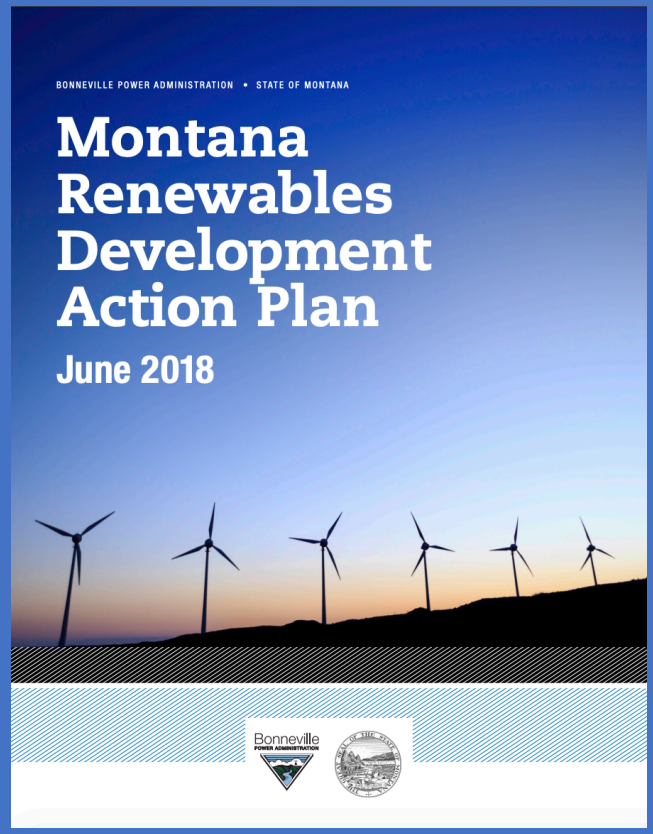
- 2018: Prompted by MEIC and others…
- Gov. Bullock and Bonneville Power Administration led regional process to look at Colstrip line, remove barriers to MT clean energy exports
  - Result: Montana Renewables Development Action Plan
  - Very successful!



MEIC

Efficient Use of Existing Transmission Lines

Hundreds of megawatts of transmission line capacity opened up just by having utilities talk to each other.



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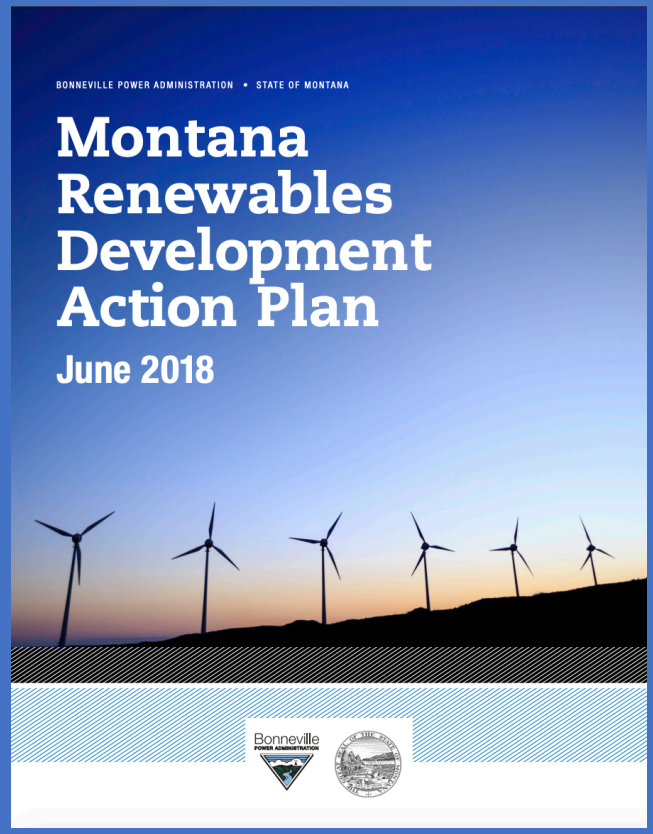
Efficient Use of Existing Transmission Lines

"The process found that the existing transfer capability of the Colstrip Transmission System can, with relatively minor investments (compared to new line builds), support a one-for-one replacement of Colstrip generation with new resources, including [renewables]."

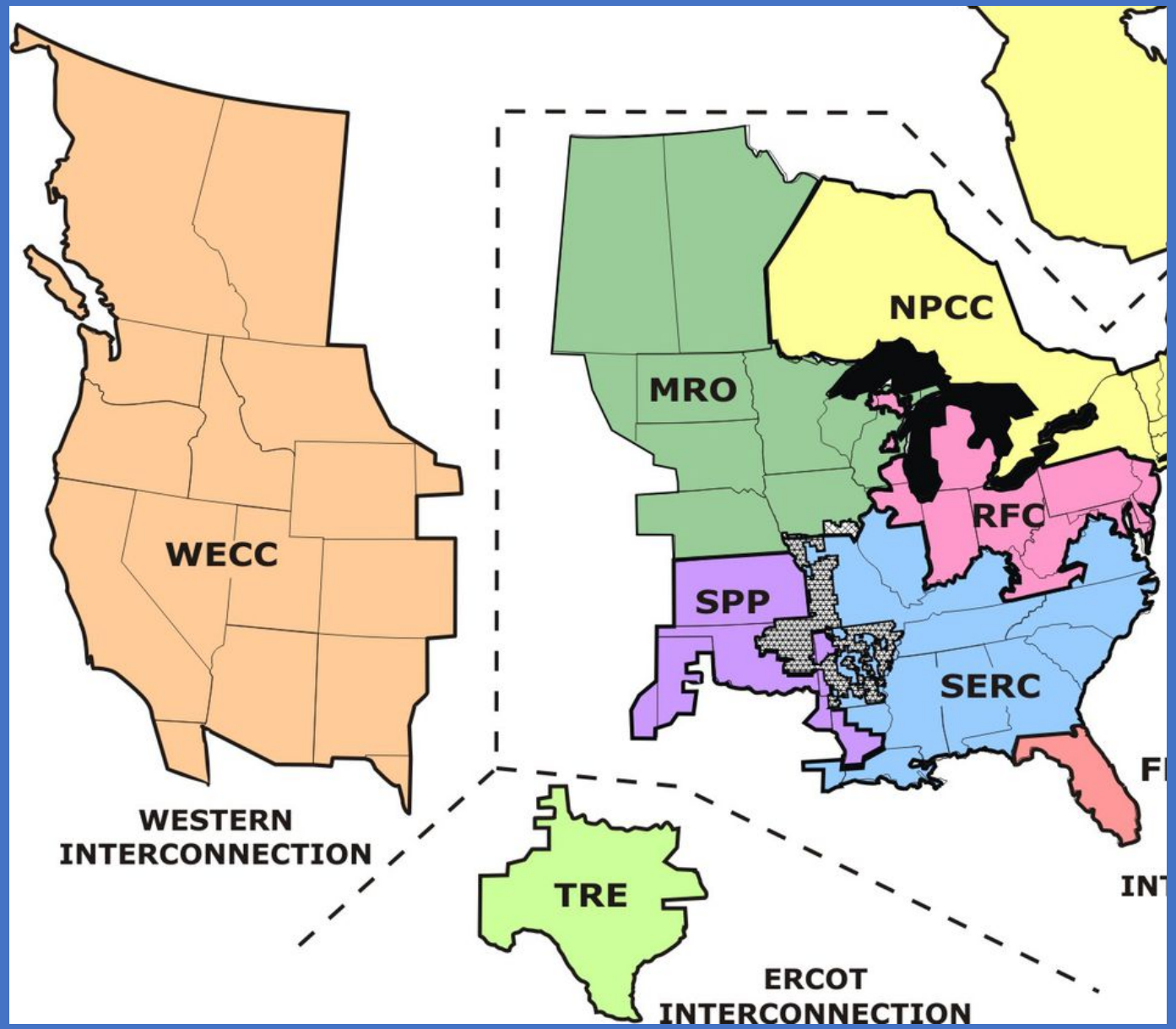
-MRDAP, pg 11

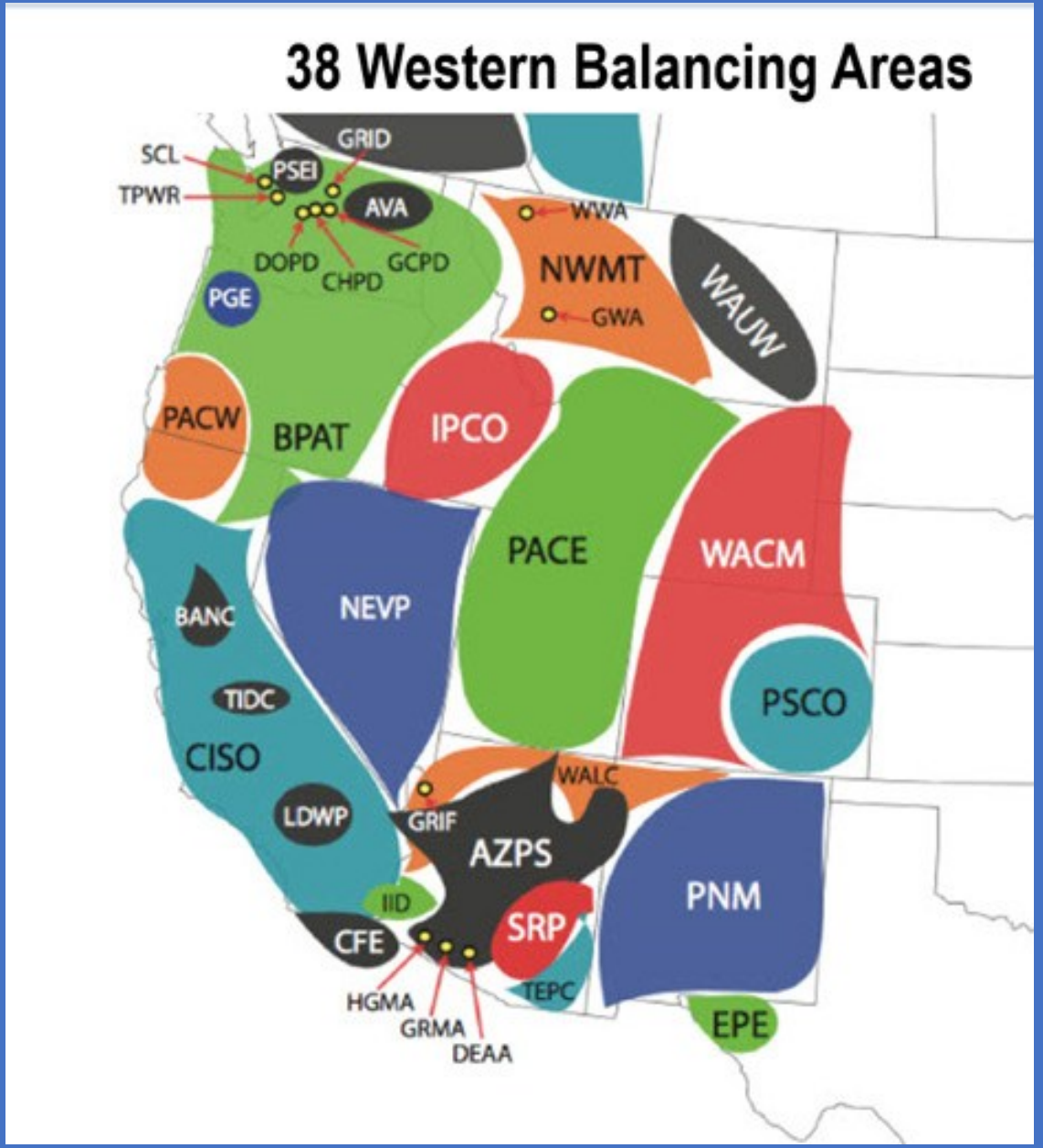
NorthWestern Energy signed off on this!



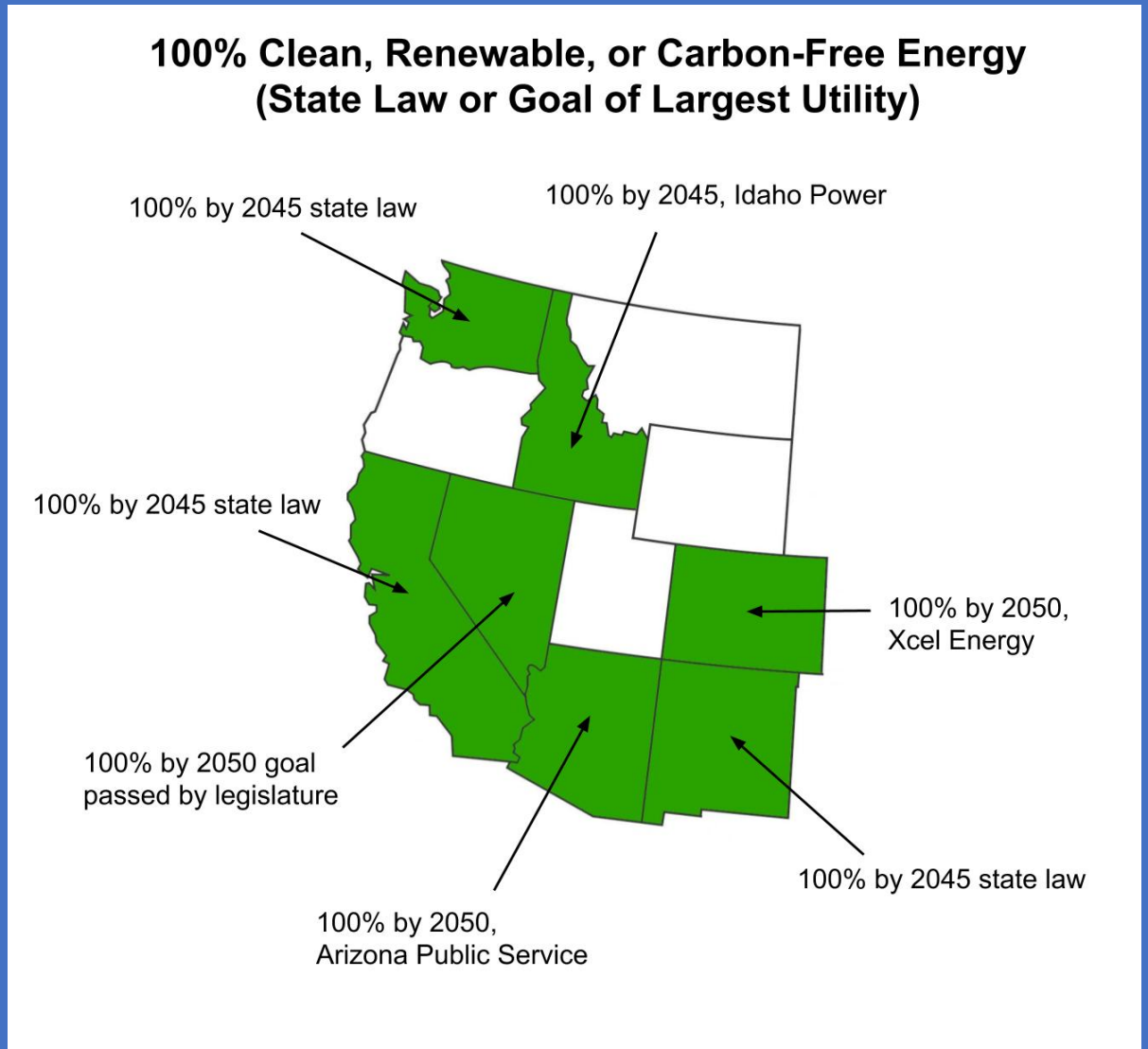
MEIC

Western U.S. grid evolving to reach clean energy future, save people money

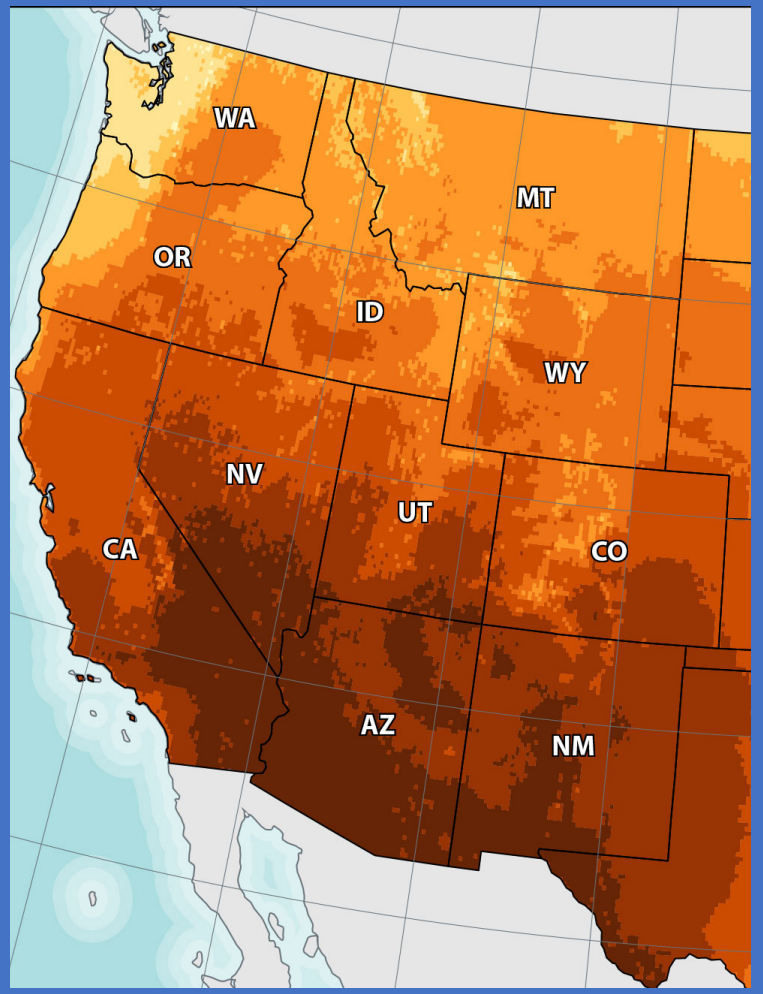

NPCC
MRO
RFC
WECC
SPP
SERC
WESTERN
INTERCONNECTION
TRE
ERCOT
INTERCONNECTION


38 Western Balancing Areas
GRID
SCL
PSEI
TPWR
AVA
WWA
DOPD
CHPD
GCPD
NWMT
WAUW
PGE
GWA
PACW
BPAT
IPCO
PACE
WACM
BANC
NEVP
TIDC
PSCO
CISO
WALC
GRIF
LDWP
AZPS
IID
PNM
SRP
CFE
TEPC
HGMA
GRMA
DEAA
EPE

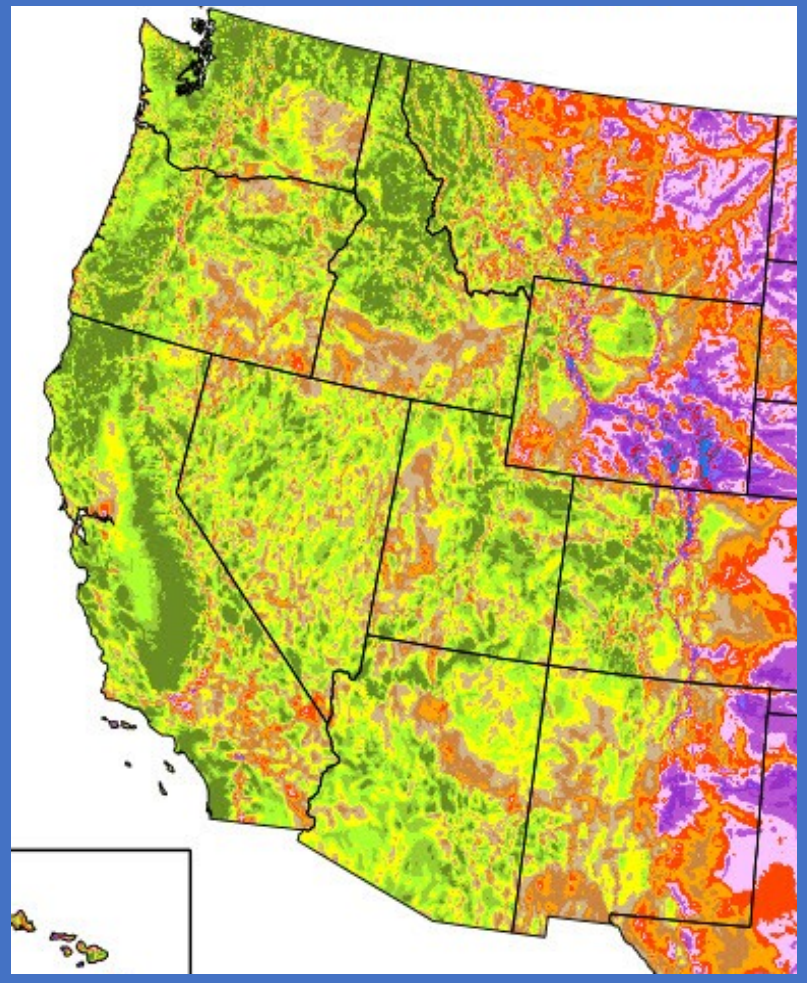
100% Goals Across West



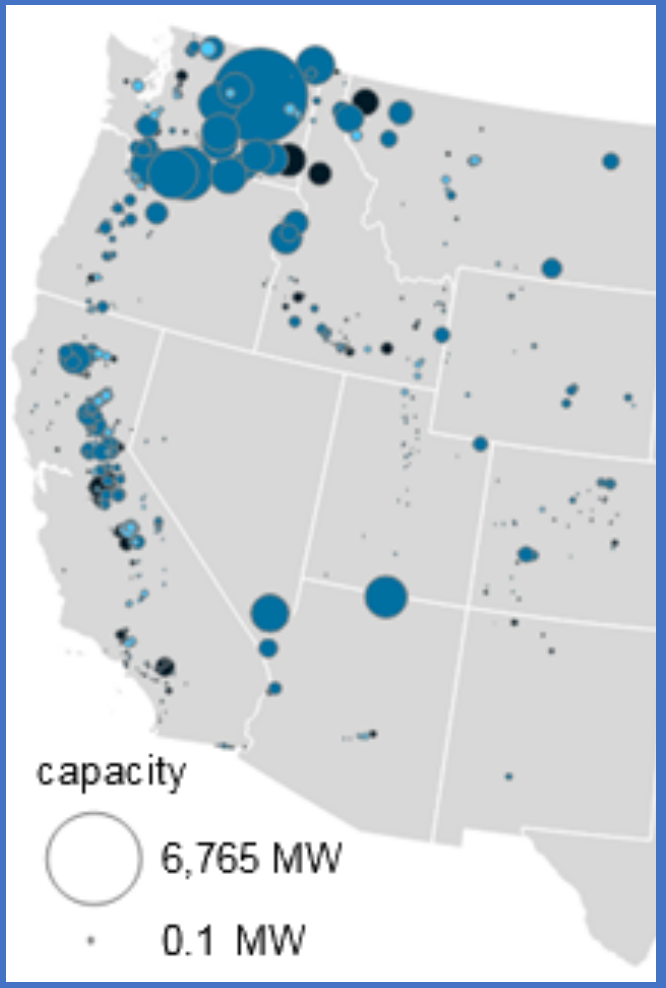
Solar



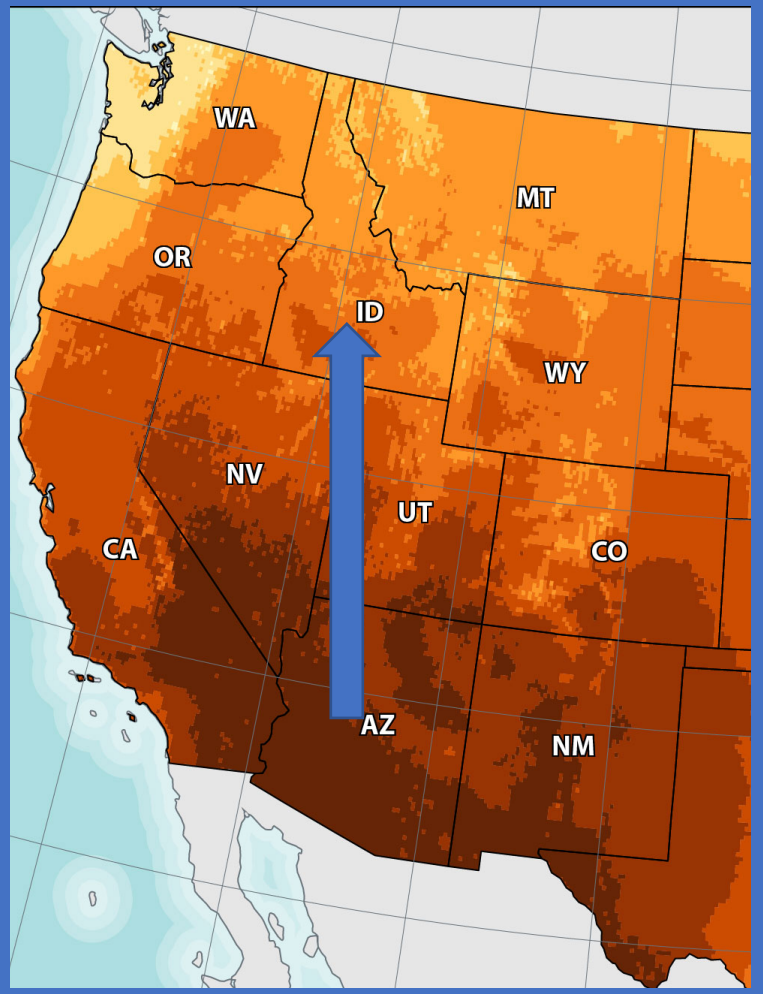
Wind



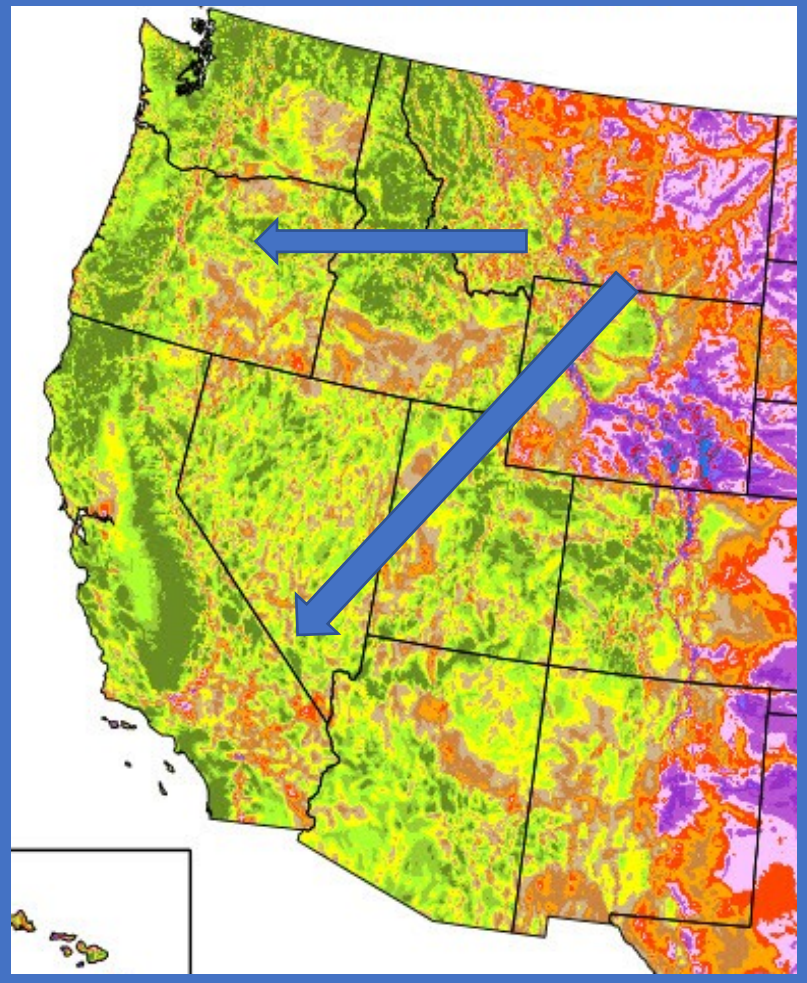
Hydro



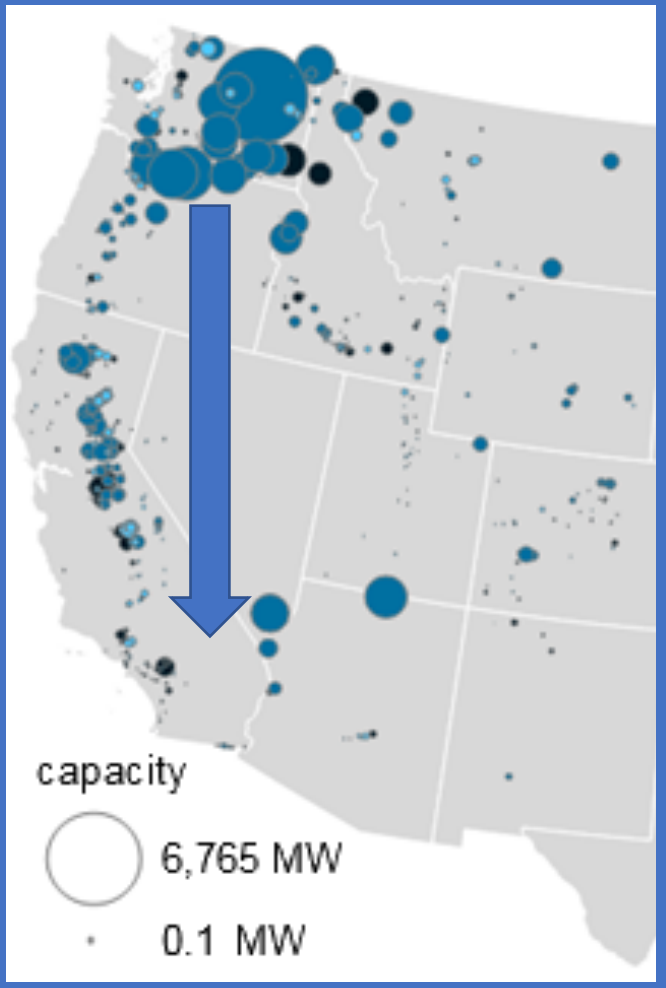
Solar



Wind

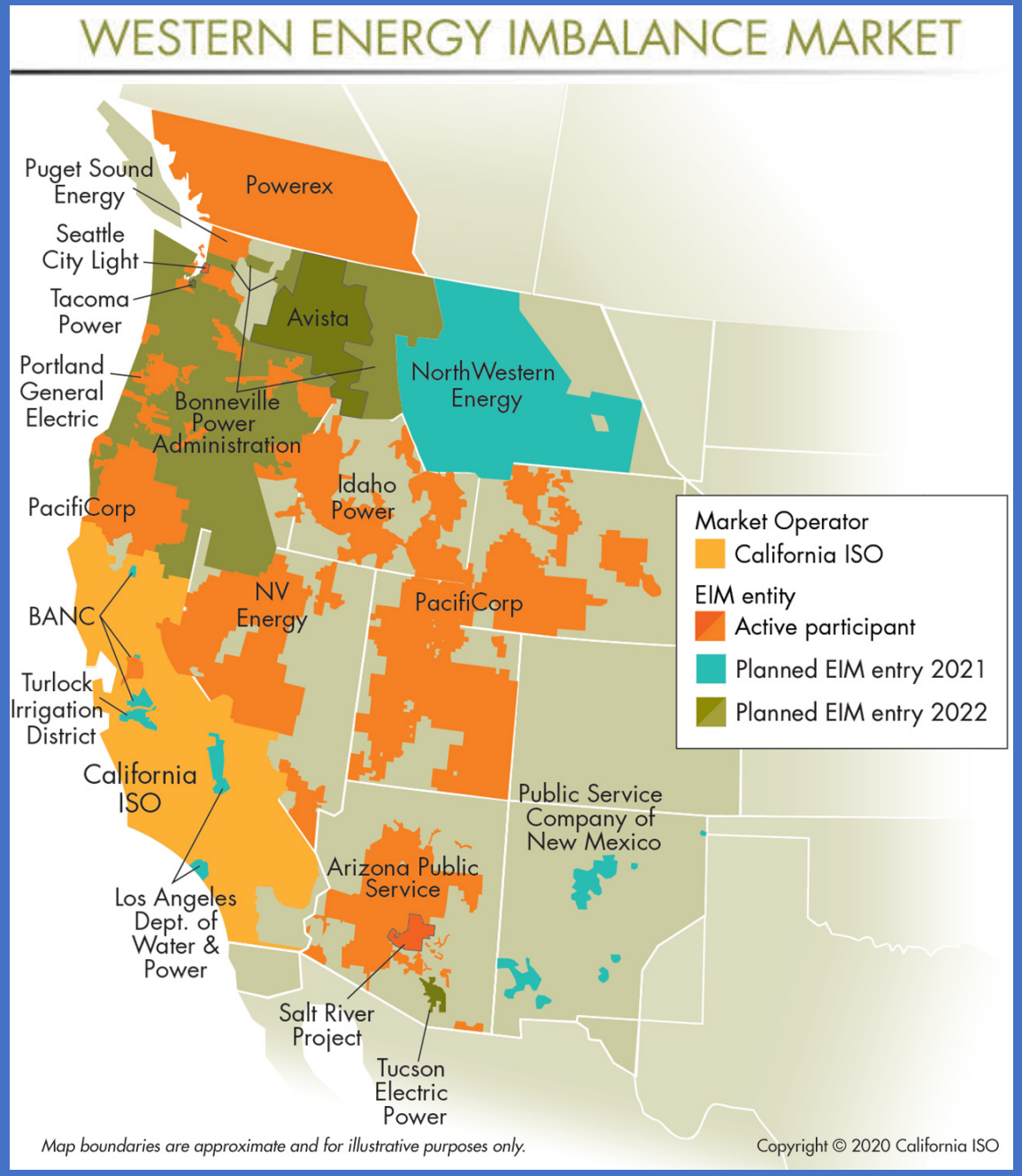


Hydro



Energy Imbalance Market (EIM)

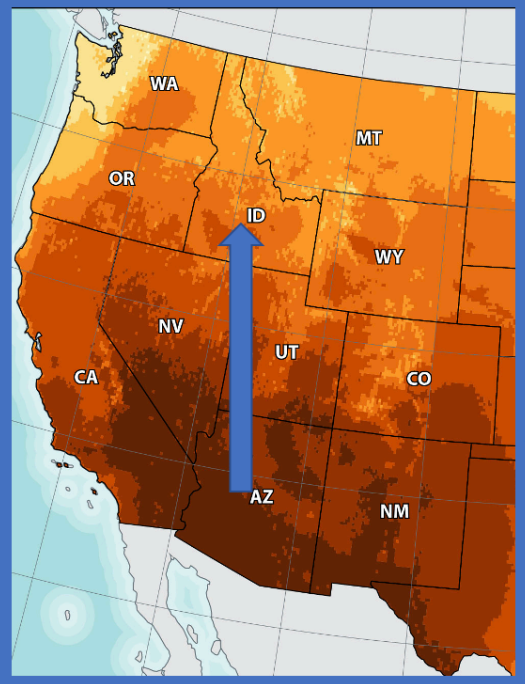
- Sharing small amounts of energy across west
- Participating utilities saved $919 million since 2014
- Even NorthWestern joining (2021)

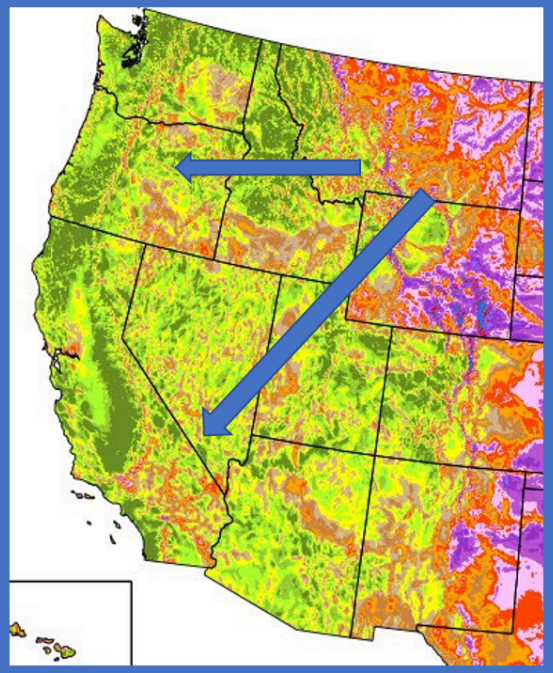


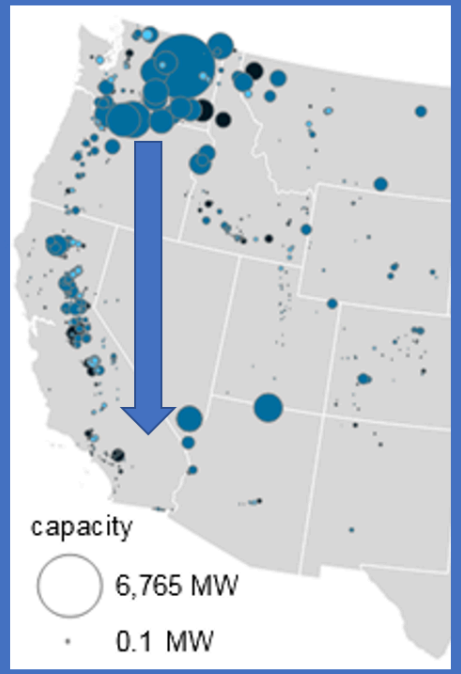
MEIC

Next Steps

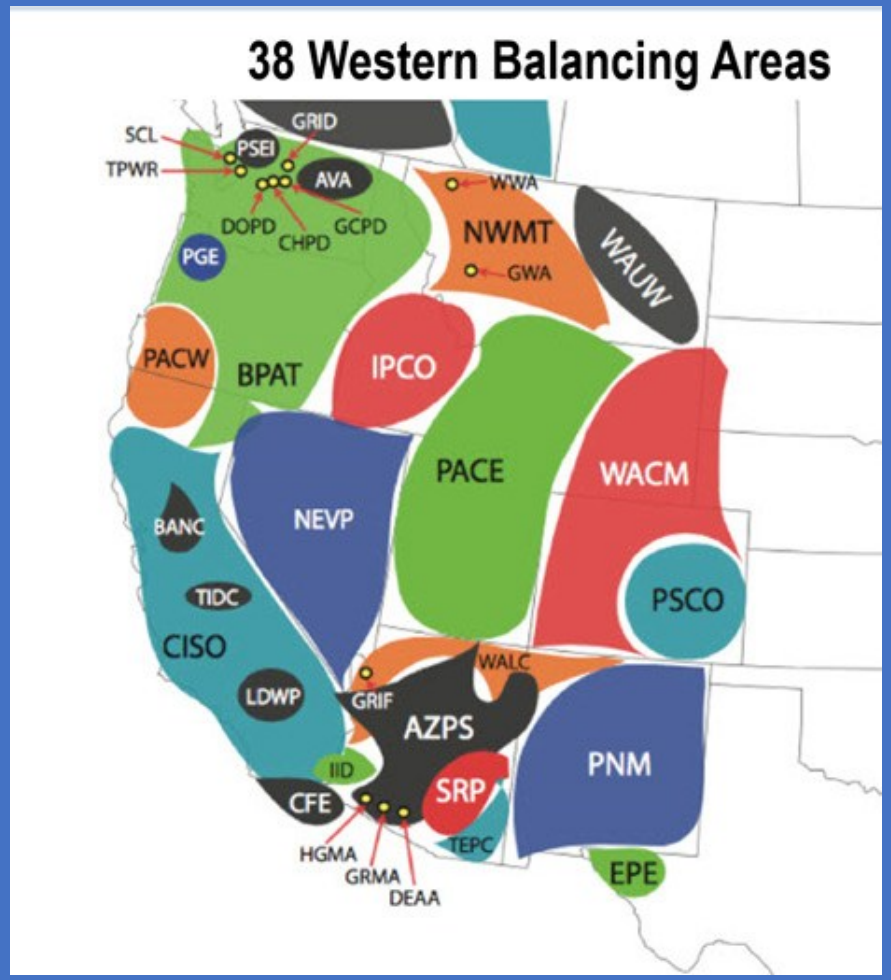
- Fully integrated western energy market
- Reach clean energy future, save $







The Dream



At least for electricity transmission ☺

Questions & Answers

Using the “Chat” function, please type in your question or email me at bfadie@meic.org

For More Information or to Join MEIC go to: MEIC.org

Join us Thursday, May 14 @ 4 pm

“The Hazards of Oil and Gas Development in Montana and What MEIC is Doing About It”