



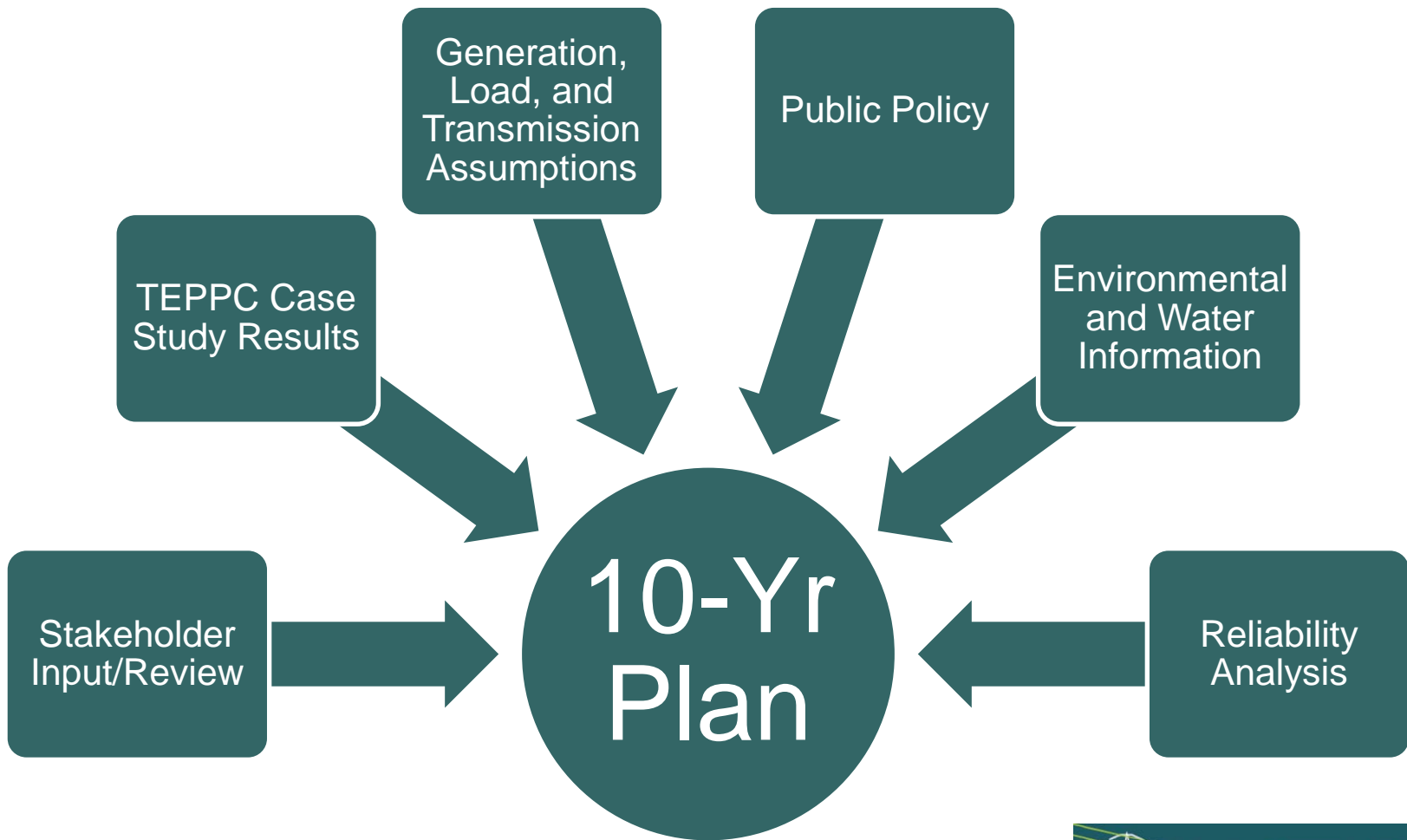
**Bradley Nickell**  
**Director of Transmission Planning**

10-Year Regional Transmission Plan  
General Overview  
September 2011

# 10-Year Regional Transmission Plan

## Plan Inputs

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# *10-Year Regional Transmission Plan*

## *Key Messages*

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- The Plan is a regional perspective
  - Expected future network
  - Alternative futures
  - Other insights
- The Plan is stakeholder-driven
  - Assumptions, studies, results
- This is the first-time for this product


# *2020 Expected Future Network*

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- Based on stakeholder-provided assumptions regarding loads, generation, and transmission
- The generation mix is a significant departure from the past
- The transmission network, including assumed additions, enabled energy to flow without significant congestion except in two areas

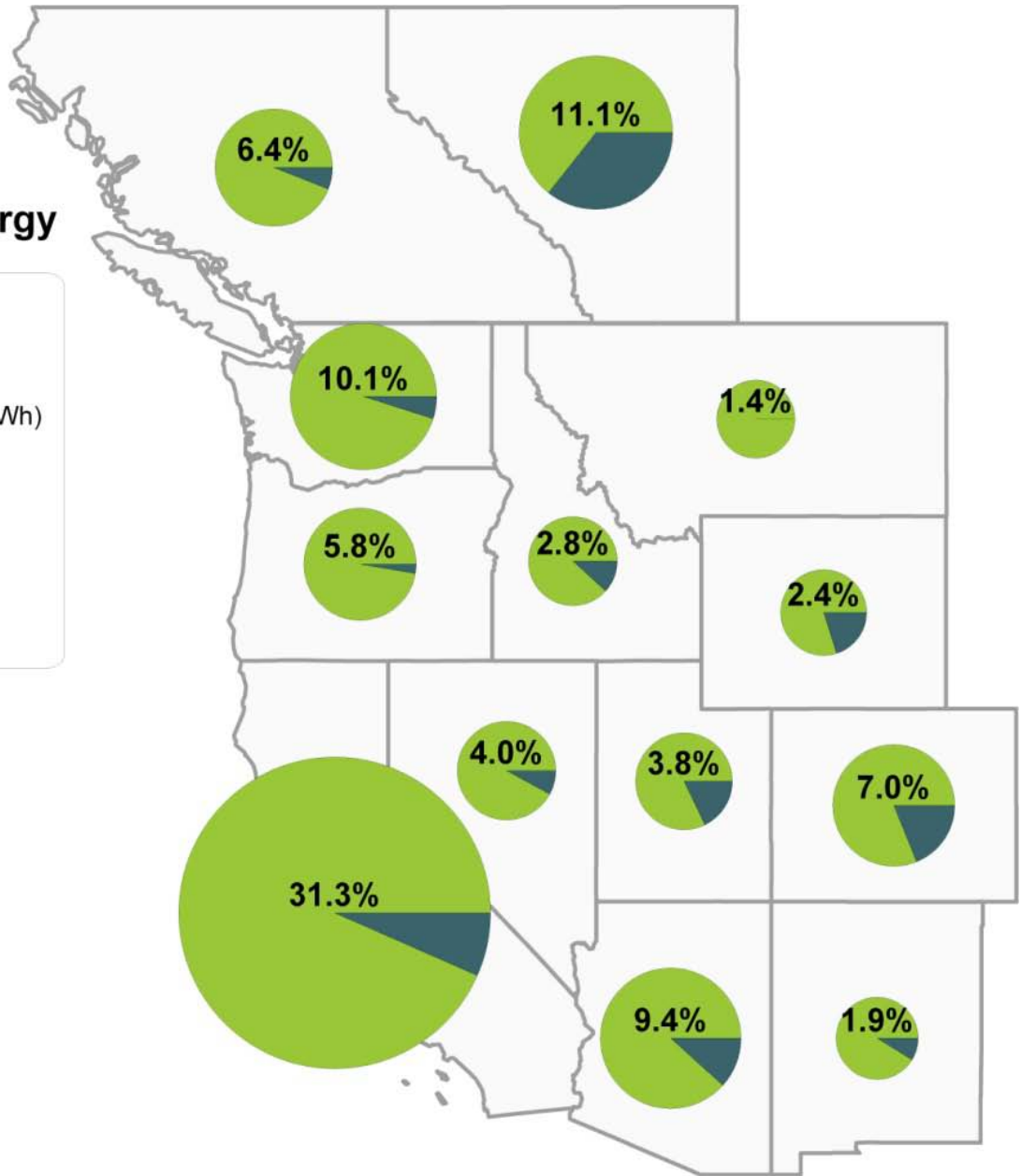
## 2020 Expected Future Load Forecast by State in Annual Energy

### Legend

-  2009 Actual Load (GWh)
-  2009 - 2020 Incremental Load Forecast (GWh)
- % State percent of total WECC 2020 load

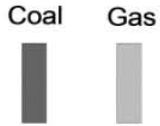
**Expected Future Load (Total): 981,460 GWh**

Note: Mexico (CFE) = 1.8%  
Texas (El Paso) = 0.8%

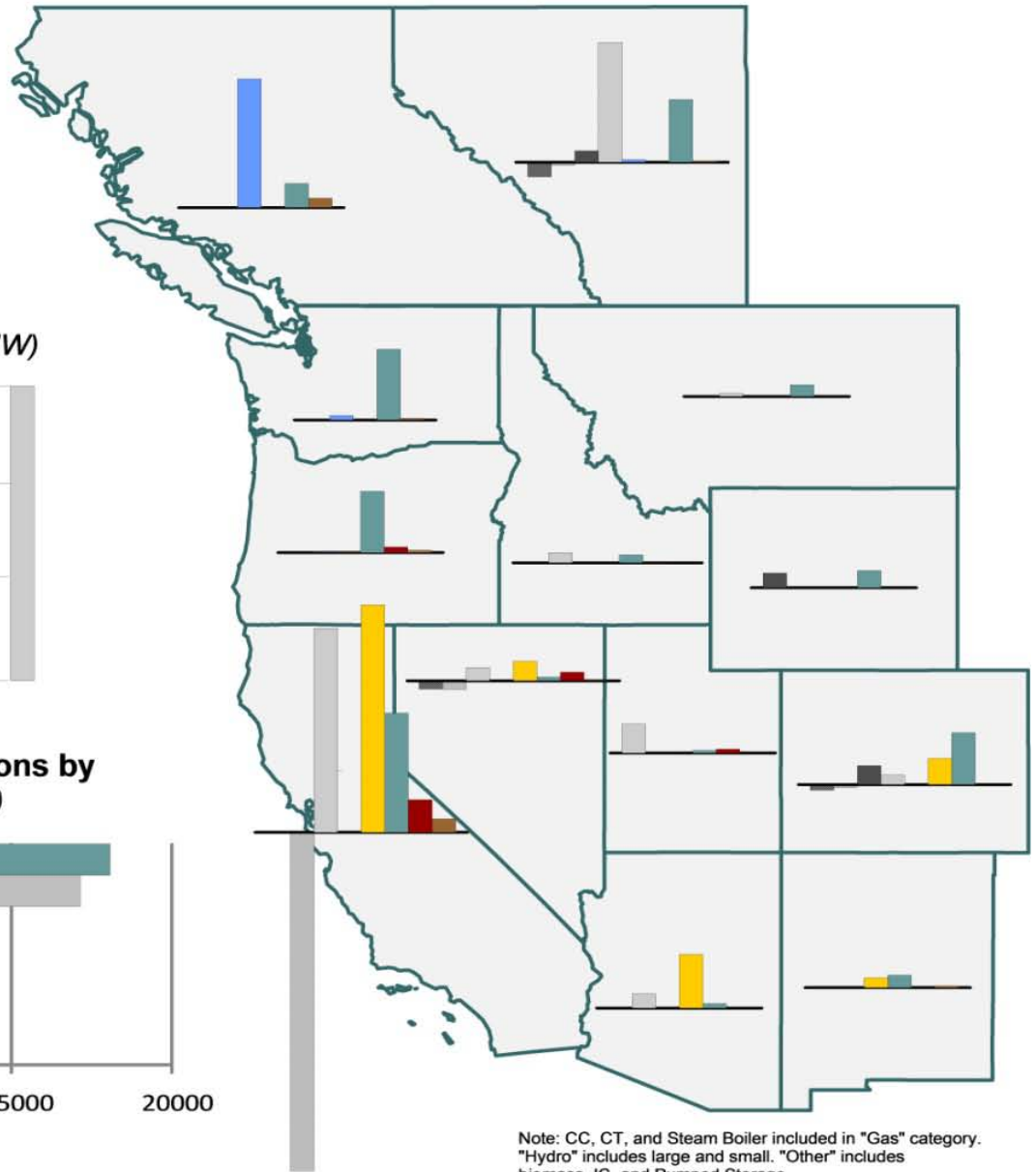
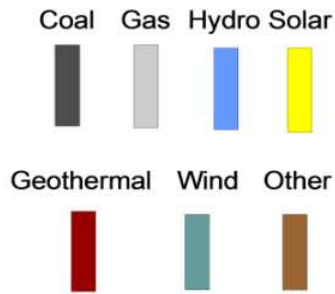


# Generation Capacity Additions and Retirements by State and Province 2010-2020

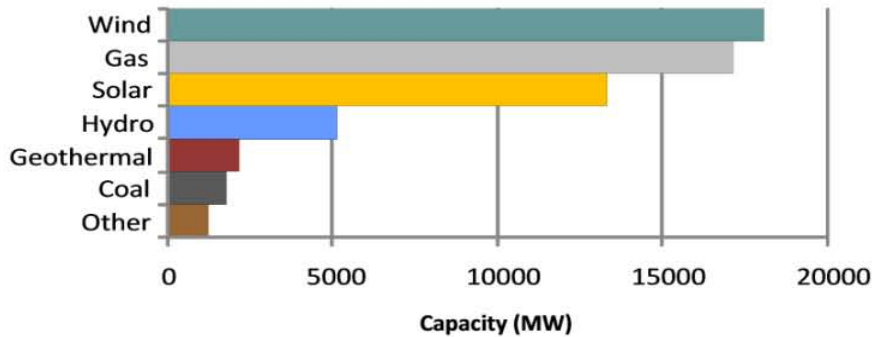
## Retired Resources



## Installed Resources



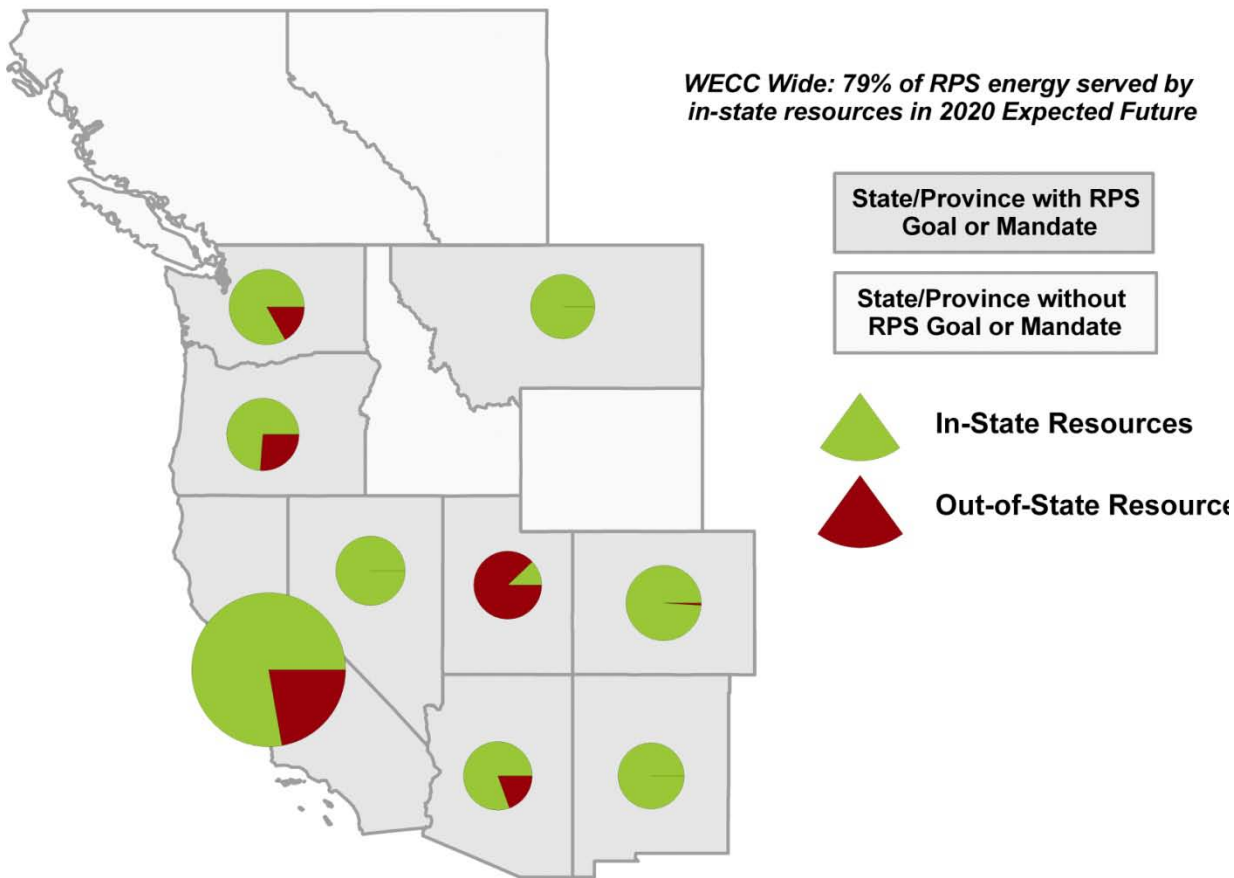
## WECC Generation Capacity Additions by Resource Type: 2010 - 2020



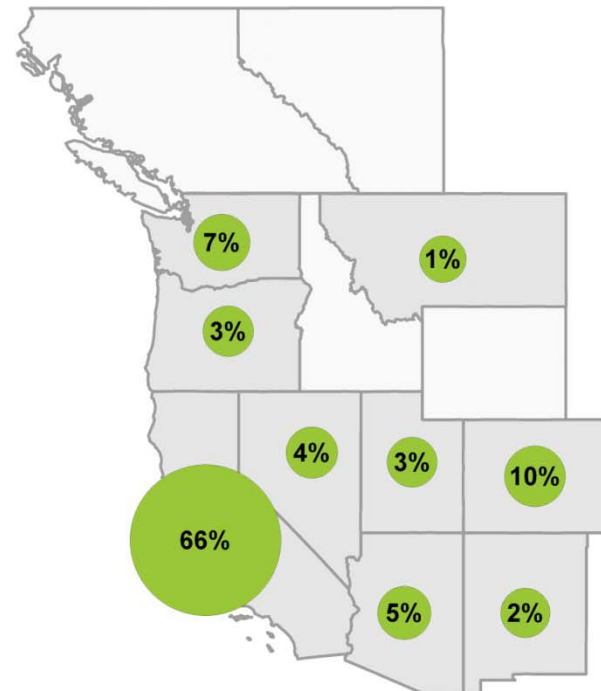
Note: CC, CT, and Steam Boiler included in "Gas" category. "Hydro" includes large and small. "Other" includes biomass, IC, and Pumped Storage.

# Renewable Procurement Trends

RPS Compliance Using In and Out of State/Province Resources (by Energy)



Percentage of WECC Incremental RPS Energy by State: 2010 - 2020



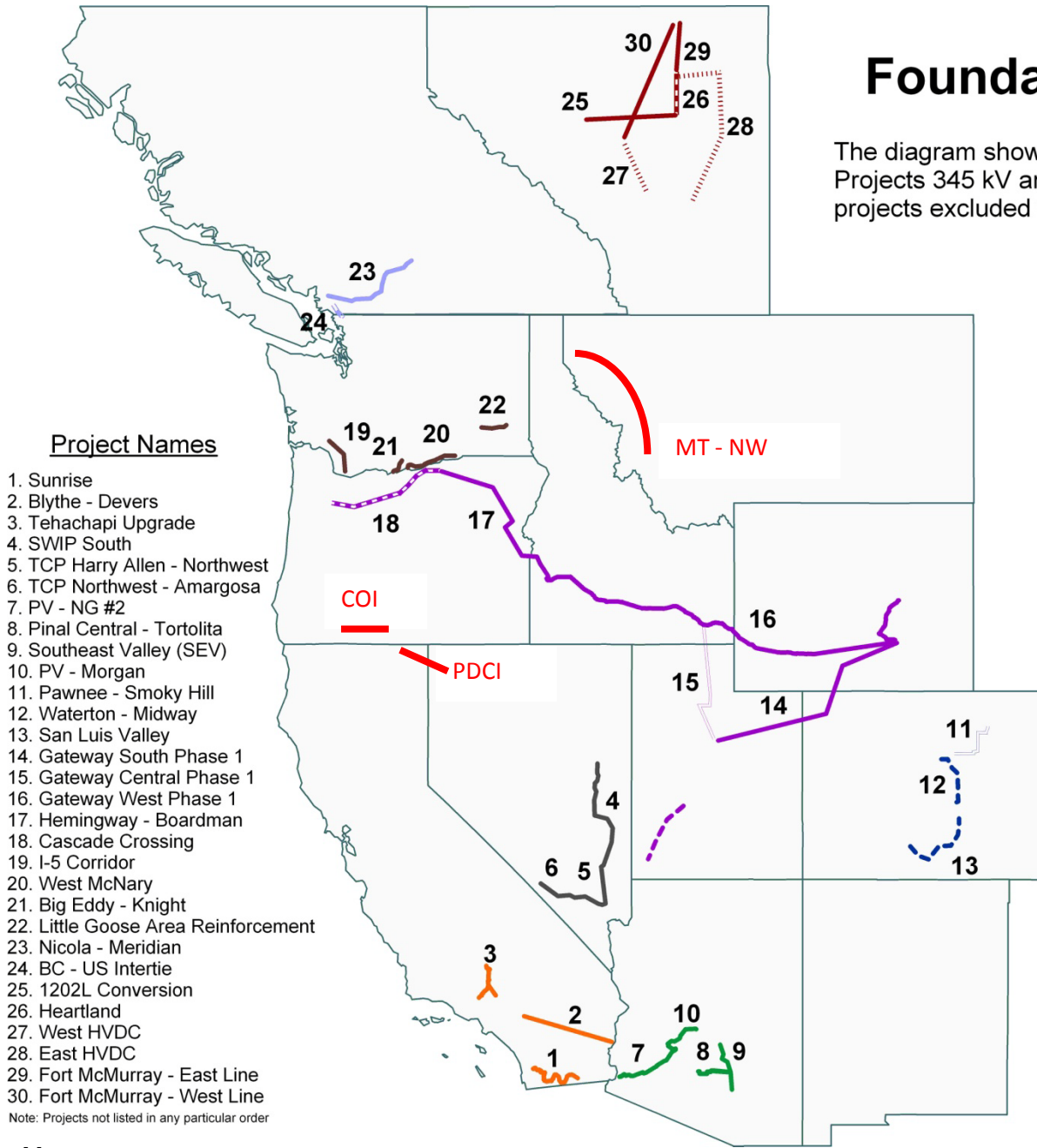
Total WECC Incremental RPS Energy 2010-2020 = 89,644 GWh

- State/Province with RPS Goal or Mandate
- State/Province without RPS Goal or Mandate



# Foundational Projects - 2020

The diagram shows illustrative routings for 30 SCG Foundational Projects 345 kV and higher. There are 14 lower voltage/reinforcement projects excluded from the map for clarity.



## Project Names

1. Sunrise
2. Blythe - Devers
3. Tehachapi Upgrade
4. SWIP South
5. TCP Harry Allen - Northwest
6. TCP Northwest - Amargosa
7. PV - NG #2
8. Pinal Central - Tortolita
9. Southeast Valley (SEV)
10. PV - Morgan
11. Pawnee - Smoky Hill
12. Waterton - Midway
13. San Luis Valley
14. Gateway South Phase 1
15. Gateway Central Phase 1
16. Gateway West Phase 1
17. Hemingway - Boardman
18. Cascade Crossing
19. I-5 Corridor
20. West McNary
21. Big Eddy - Knight
22. Little Goose Area Reinforcement
23. Nicola - Meridian
24. BC - US Intertie
25. 1202L Conversion
26. Heartland
27. West HVDC
28. East HVDC
29. Fort McMurray - East Line
30. Fort McMurray - West Line

Note: Projects not listed in any particular order

## Transmission Key

- 500 kV Single Circuit Line
- 345 kV Single Circuit Line
- 500 kV Double Circuit Line
- 345 kV Double Circuit Line
- DC Circuit (various voltages)

## Sub-Region Key

- |              |              |
|--------------|--------------|
| <b>CAISO</b> | <b>NTTG</b>  |
| <b>SSPG</b>  | <b>CG</b>    |
| <b>SWAT</b>  | <b>BCCPG</b> |
| <b>CCPG</b>  | <b>AESO</b>  |

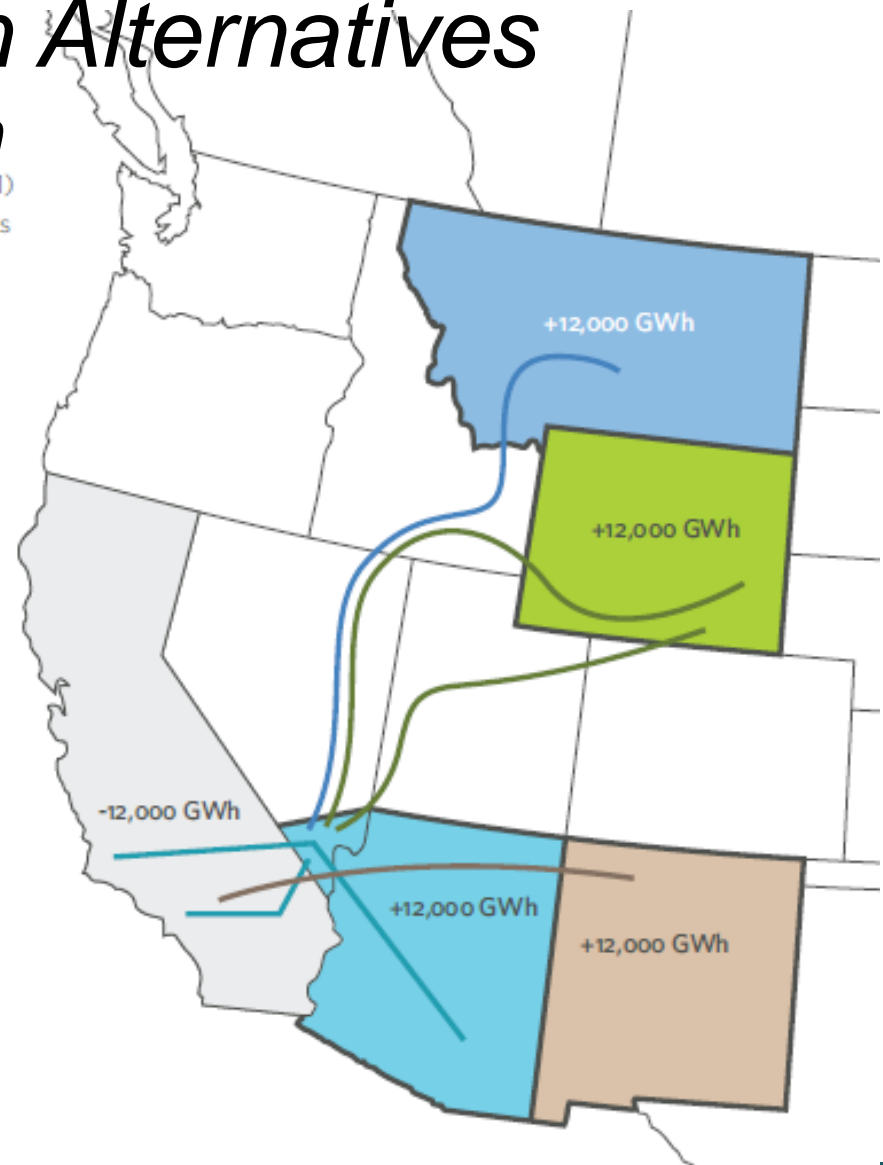




# *Resource Relocation Alternatives*

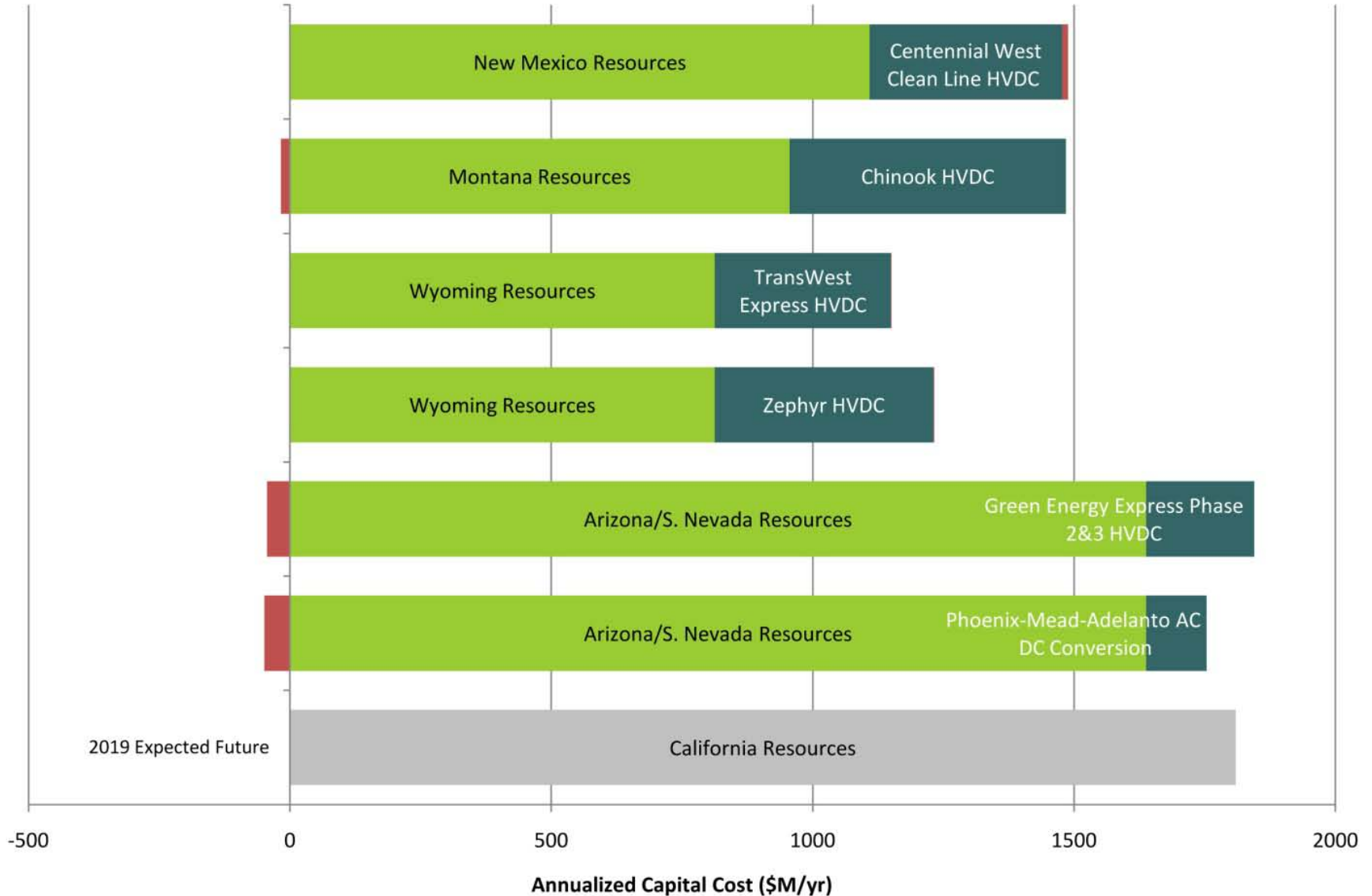
## *Transmission Expansion*

- Relocate 12,000 GWh of renewable generation from California to eight different locations
- Observe the impact on costs and transmission needs



# Capital Cost Comparison of Potentially Cost-Effective Resource Relocation Alternatives with Large-Scale Transmission Expansion

- Cost Estimate of 12,000 GWh CA Resources
- Cost Estimate of 12,000 GWh Relocated Resources
- Cost Estimate of Incremental Transmission
- Change in Production Cost Relative to Expected Future



# *10-Year Regional Transmission Plan Observations & Recommendations*

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1. Cost-effective remote renewable resources
2. Montana to Northwest (Path 8)
3. Pacific Tie Paths (Paths 65, 66)
4. Operational impacts of variable generation
5. Planning cooperation
6. Environmental and cultural considerations in future transmission planning processes
7. Water resource impacts on the future generation mix
8. Gaps in regional transmission planning processes

# Questions

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All information on the WECC 10-Year  
Regional Transmission Plan may be found  
at <http://www.wecc.biz/10yrPlan>.