



# The Need for a Western Grid and New Mexico Leadership

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Home

Live TV



## 12 years to stop climate catastrophe



Humans must make rapid, unprecedented changes to end global warming, experts say



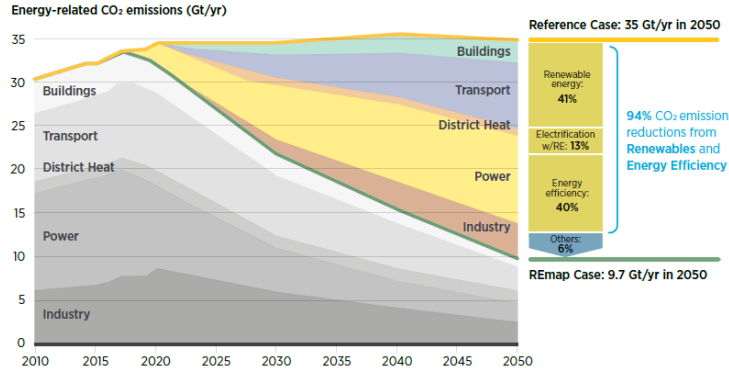
# How to Solve for Climate?

- 1) Clean the Grid
- 2) Electrify Everything

## Deep Carbon Emissions are Needed: Large Scale Electricity is at the Center all Solution Sets

Figure 2. Renewable energy and energy efficiency can provide over 90% of the reduction in energy-related CO<sub>2</sub> emissions

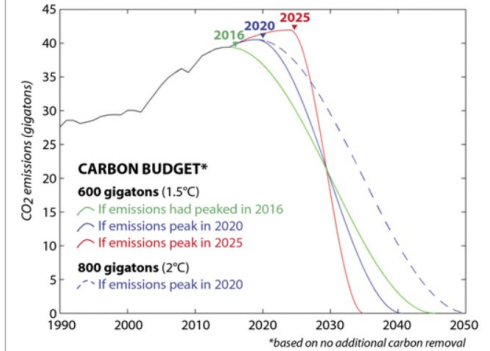
Annual energy-related CO<sub>2</sub> emissions and reductions, 2015-2050 (Gt/yr)



Annual energy-related emissions are expected to remain flat (under current policies in the Reference Case) but must be reduced by over 70% to bring temperature rise to below the 2°C goal. Renewable energy and energy efficiency measures provide over 90% of the reduction required.

### Staying Within a 1.5°C Carbon Budget

To keep global temperatures from rising more than 1.5°C, a goal of the Paris climate accord, the world is limited in how much carbon dioxide emissions it can still release. In 2017, that budget was estimated to be around 600 gigatons of CO<sub>2</sub> for a medium chance of staying under 1.5°C. This chart shows how much faster countries will have to cut emissions the longer they wait to act.



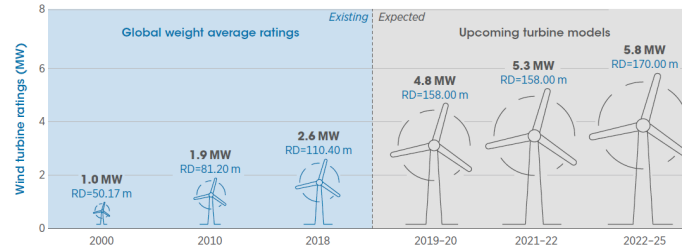
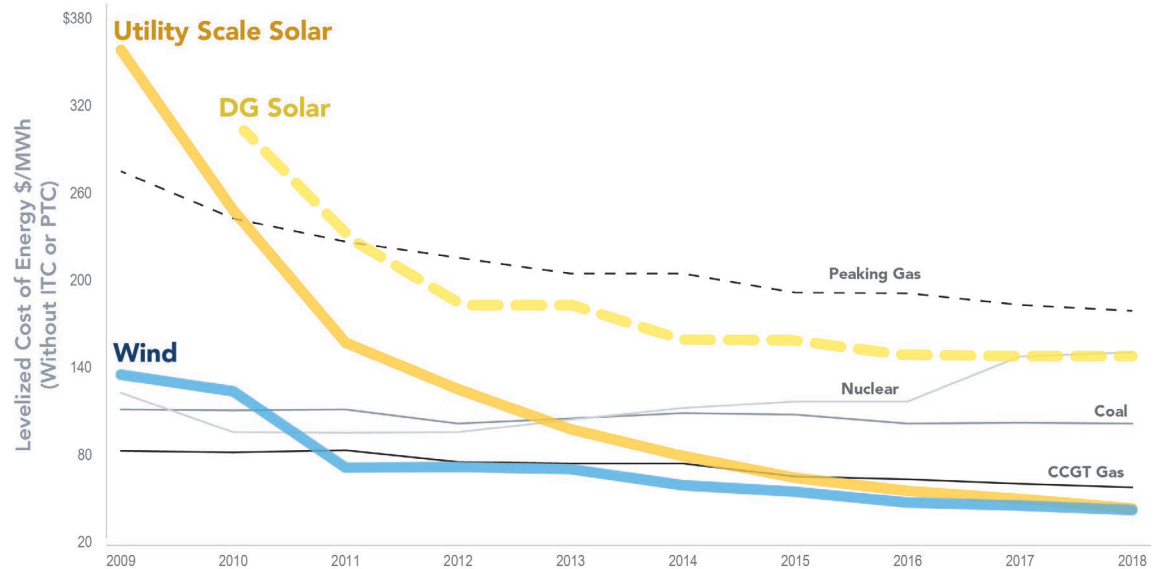
SOURCE: Stefan Rahmstorf, 2017

InsideClimate News

# Economics are Driving Wind and Solar

- ❖ Wind and solar are now cheaper than new gas and new coal, even without the ITC and PTC
- ❖ Wind and solar will be a large part of new energy markets based solely on competitive cost
- ❖ **Crossover in early 2030s:** new wind & solar will be cheaper than existing gas

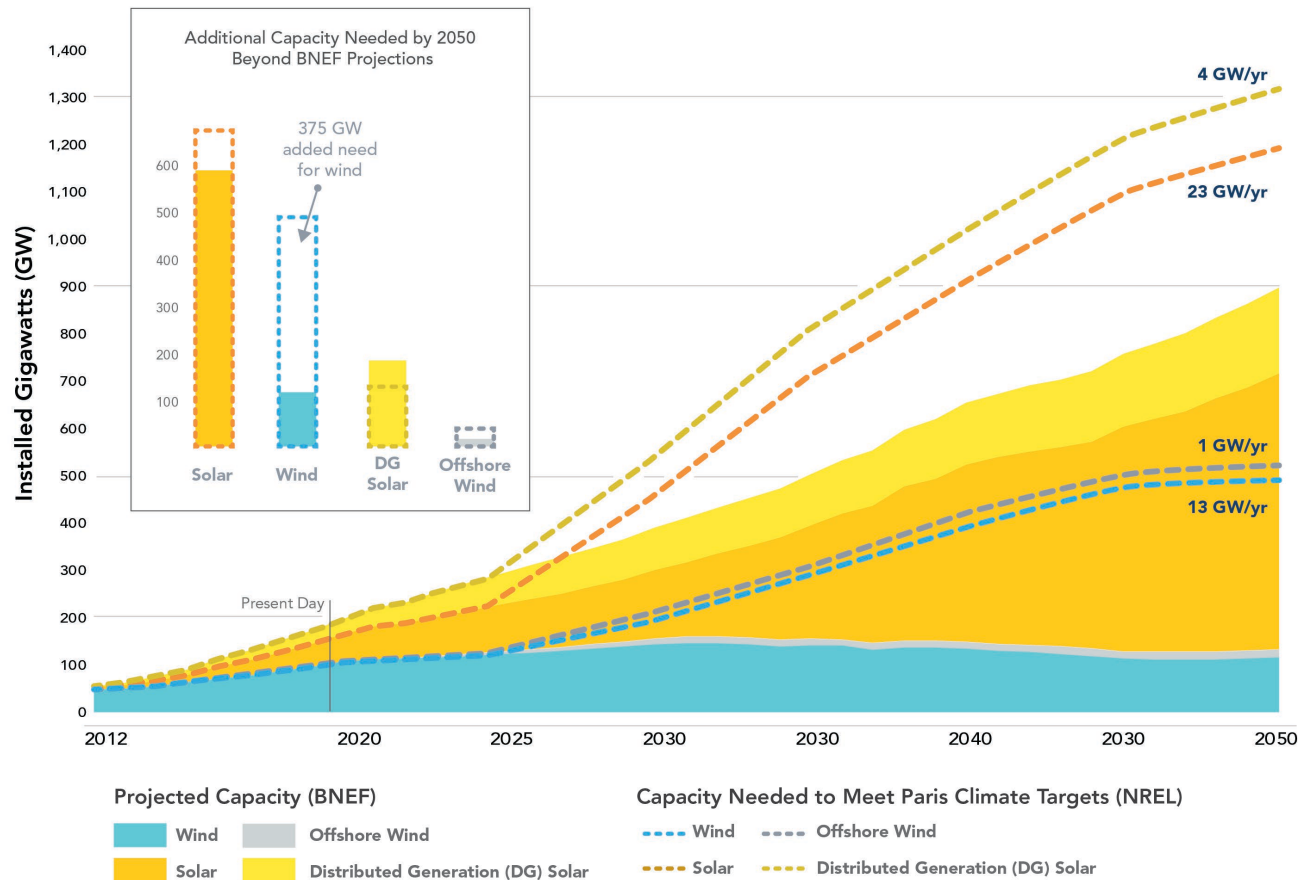
## Wind and Solar are Now the Least Cost Technologies for New Power Plants



# The Scale of the Need for Wind and Solar

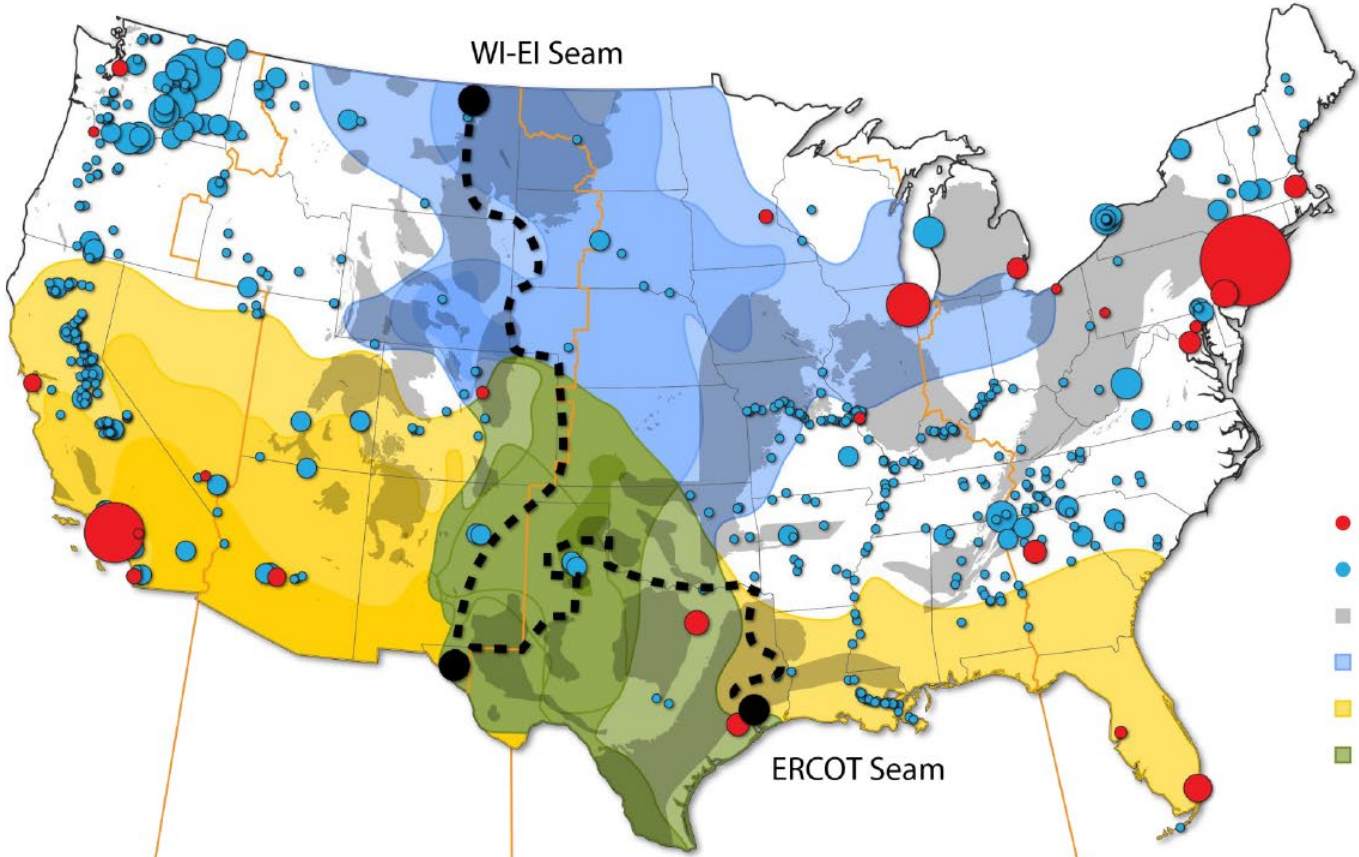
- ❖ Large U.S. market of **25 - 40 GW per year** for wind and solar
- ❖ Projected total need to meet climate goals:
  - 650+ GW solar
  - 450+ GW wind
- ❖ Solar is mostly on track, but wind is far behind
- ❖ New policies needed to achieve enough combined wind and solar

## Projected U.S. Wind and Solar Markets Compared to Capacity Needed for Paris Climate Targets



Sources: (1) "New Energy Outlook 2019" (BNEF) <https://about.bnef.com/new-energy-outlook> and (2) "Standard Scenarios Report" (NREL) <https://www.nrel.gov/docs/fy19osti/71913.pdf>

# Renewables are Strong where Grid is Weak



Pacific  
12:00 PM

Mountain  
1:00 PM

Central  
2:00 PM

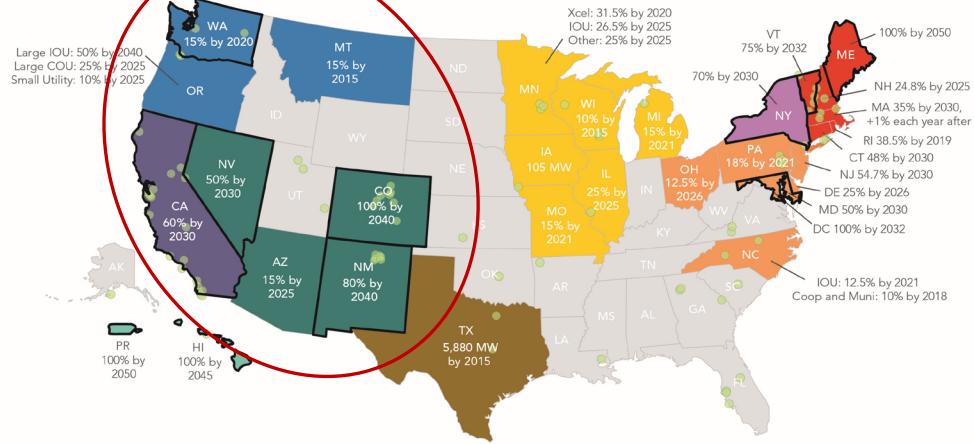
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# Energy Policies Have Changed Rapidly in the Past Year

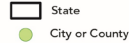
- ~78% of energy use in the west is now aligned on decarbonization
- The New Mexico ETA drives ~4 GW by 2030
- Similar policies in the West drive ~100 GW by 2035

## Renewable Portfolio Standards (RPS) and 100% Carbon Free Policies

Revised: 09/30/2019



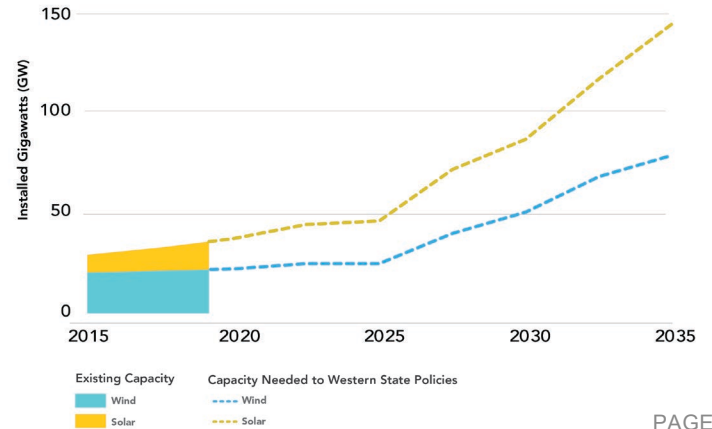
### 100% Carbon Free Targets



### State RPS Laws by Region



### Wind and Solar Needed in the Western U.S. to Meet Existing State Policies



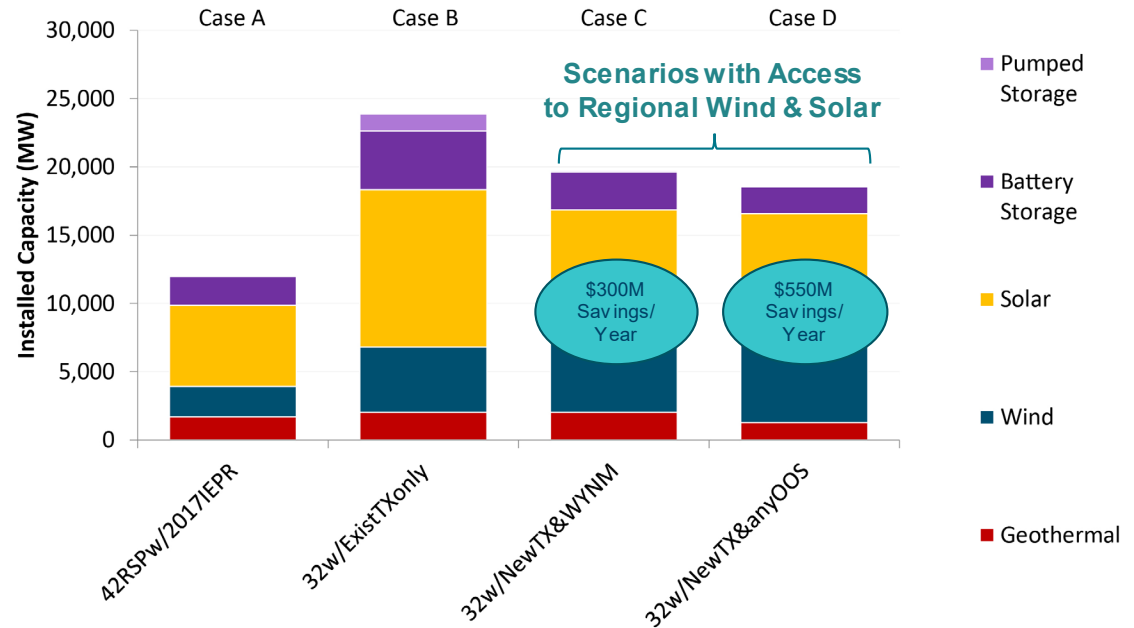
Sources: Energy Strategies, "Western Flexibility Assessment" (2019)

Sources: AWEA 2019 Q2 Market Report

# Western Market Demand

- ❖ The cost savings of an organized western grid measure in the billions by the 2030s
- ❖ Deep GHG reductions in the Western Grid require coordination

## CPUC Identifies \$300M – \$550M Annual Savings With Access to Regional Wind and Solar

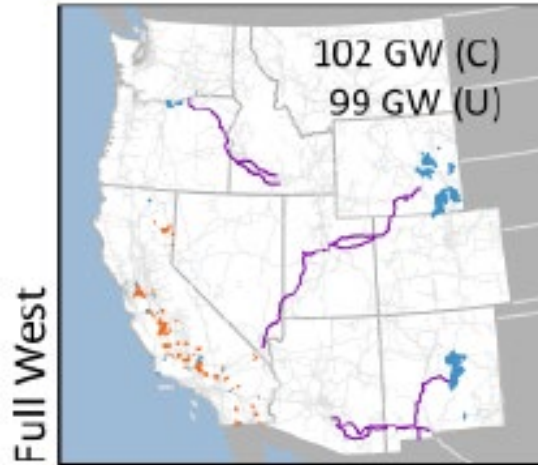




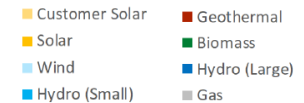
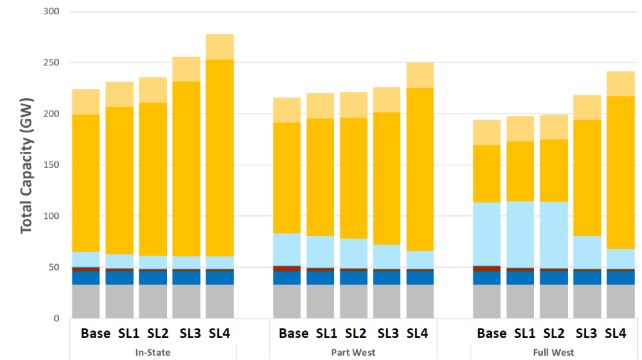
# Western Market Demand

- ❖ Regional diversity of wind and solar translates to less overall build out for the same GHG reduction
- ❖ Less land impact is favored by conservation advocates
- ❖ Requires transmission upgrades and a flexible western grid

## The Nature Conservancy Identifies a Diverse Regional Mix as Essential for Land Conservation



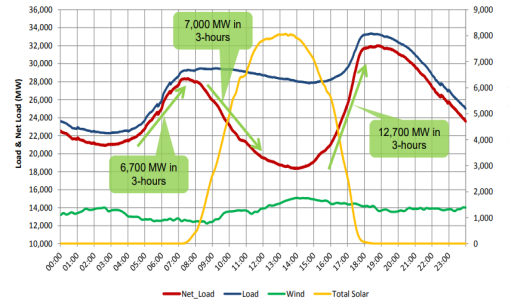
Total Resource Mix by Capacity - 2050



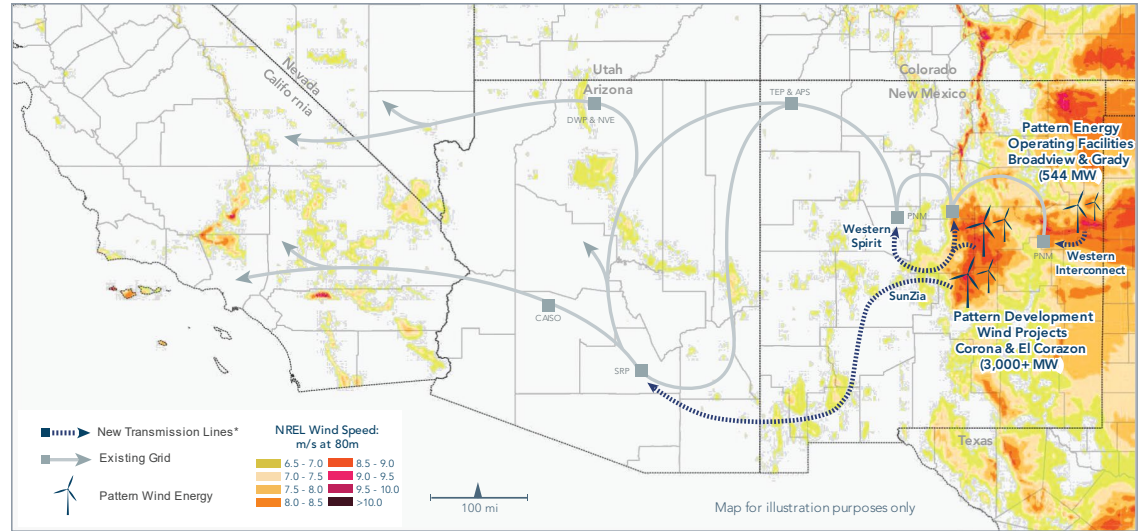
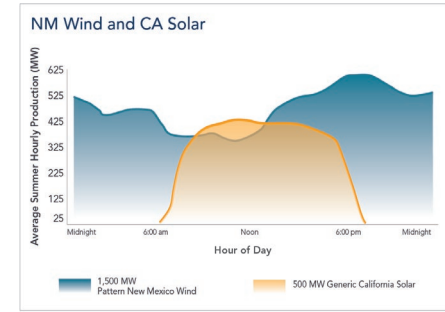
# Benefits of Diversified Grids

- ❖ Electricity markets are not designed for variable, zero-marginal-cost wind and solar so they need regional diversity
- ❖ “Duck Curve” challenges are affecting many markets with high renewable penetration
- ❖ Regional coordination enables least cost, highly efficient pairing of wind and solar resources

## Solar Causes Grid Challenges in California

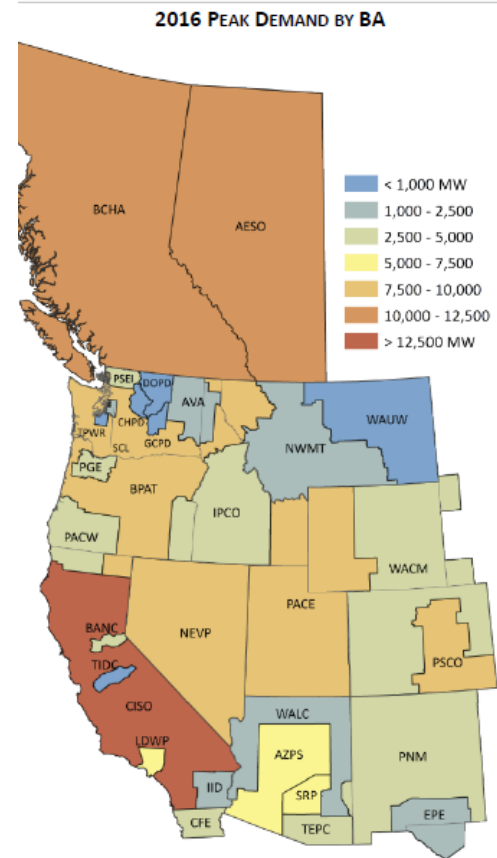
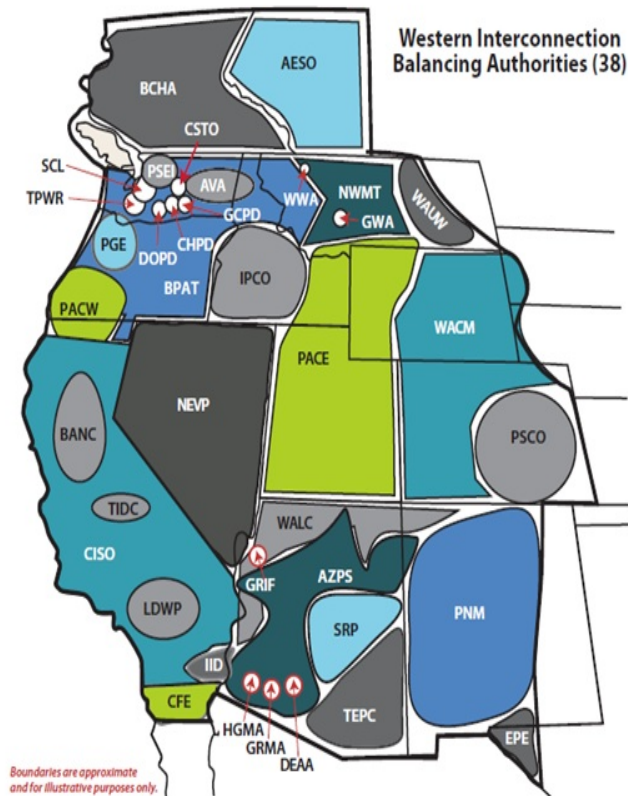


## NM Wind Helps CA as a High Value Resource

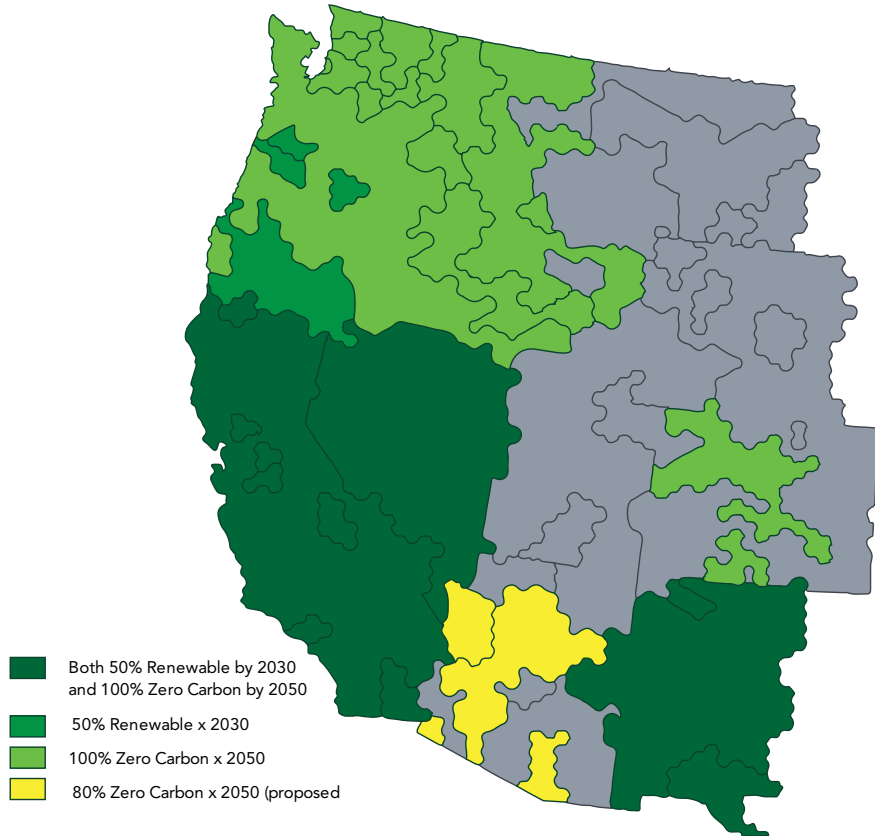


# The Western Grid has Unique Challenges

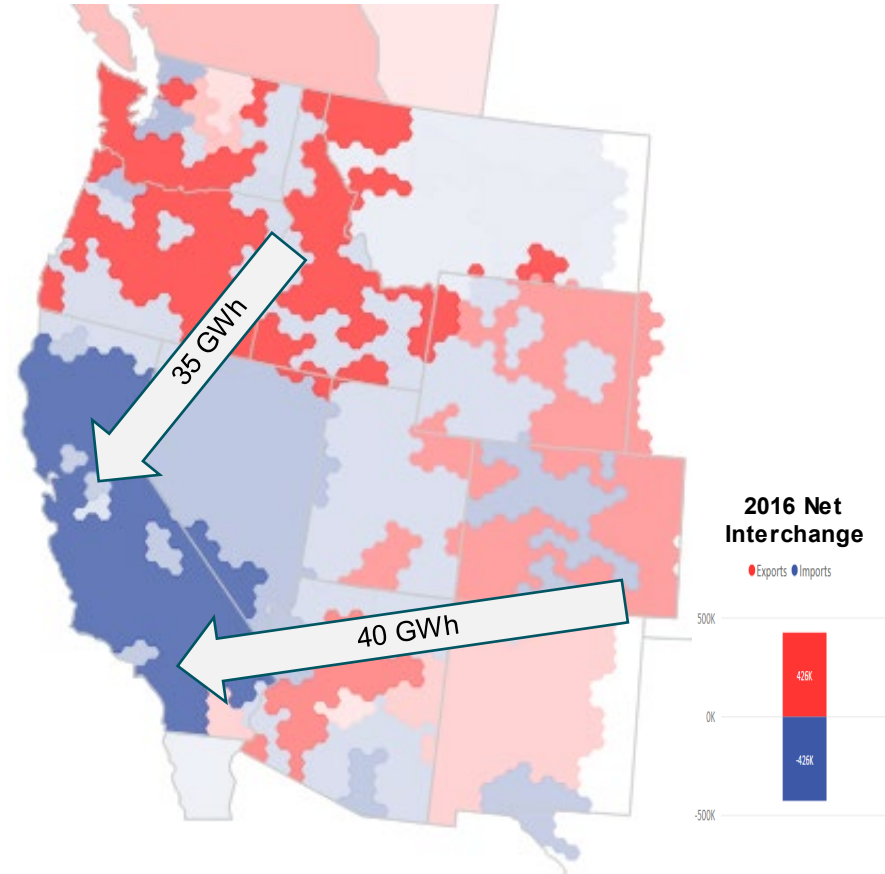
- ❖ Bureaucratic challenges of grid operators
- ❖ Different grid management software
- ❖ BAs can't communicate in real time
- ❖ Customers cannot access least-cost renewable power



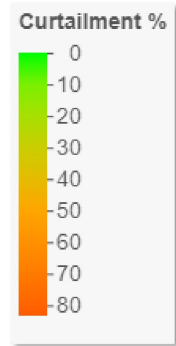
# The Current Western Grid Relies Heavily on Coal Imports from Mountain States to California



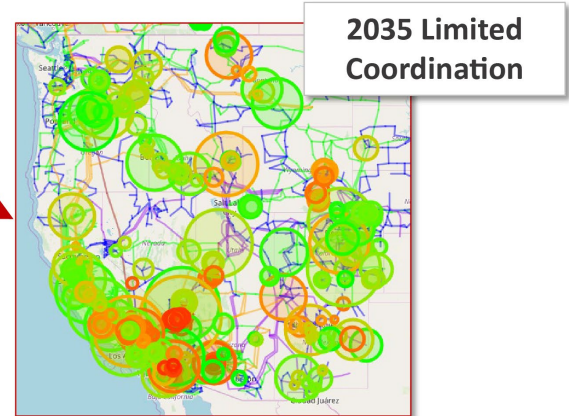
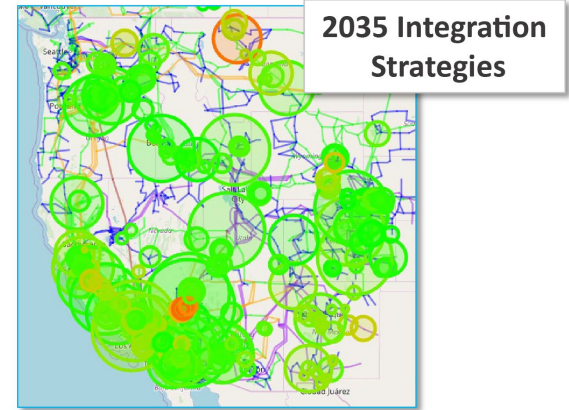
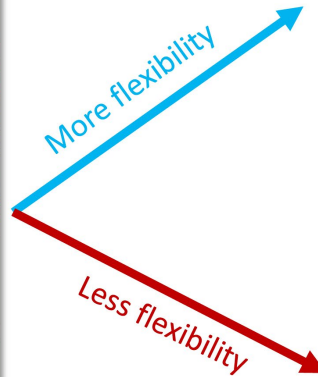
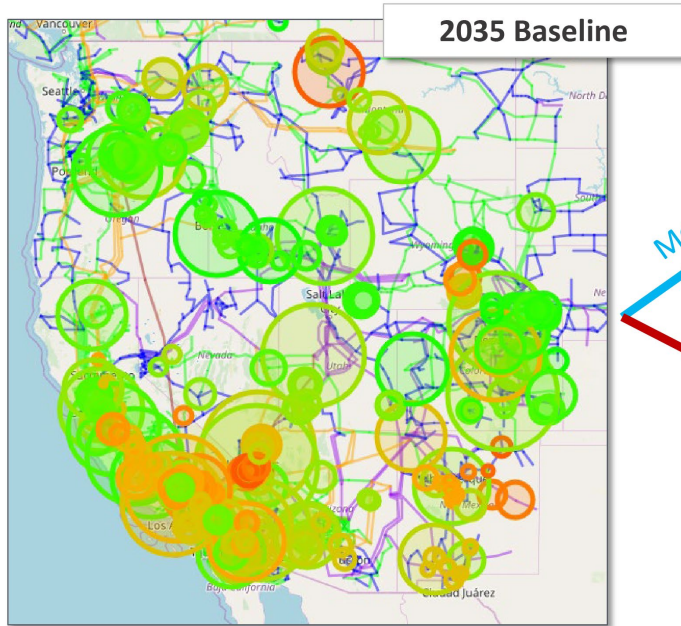
2050 Need for new Wind & Solar: ~140 GW  
Current installed Wind & Solar: ~35 GW



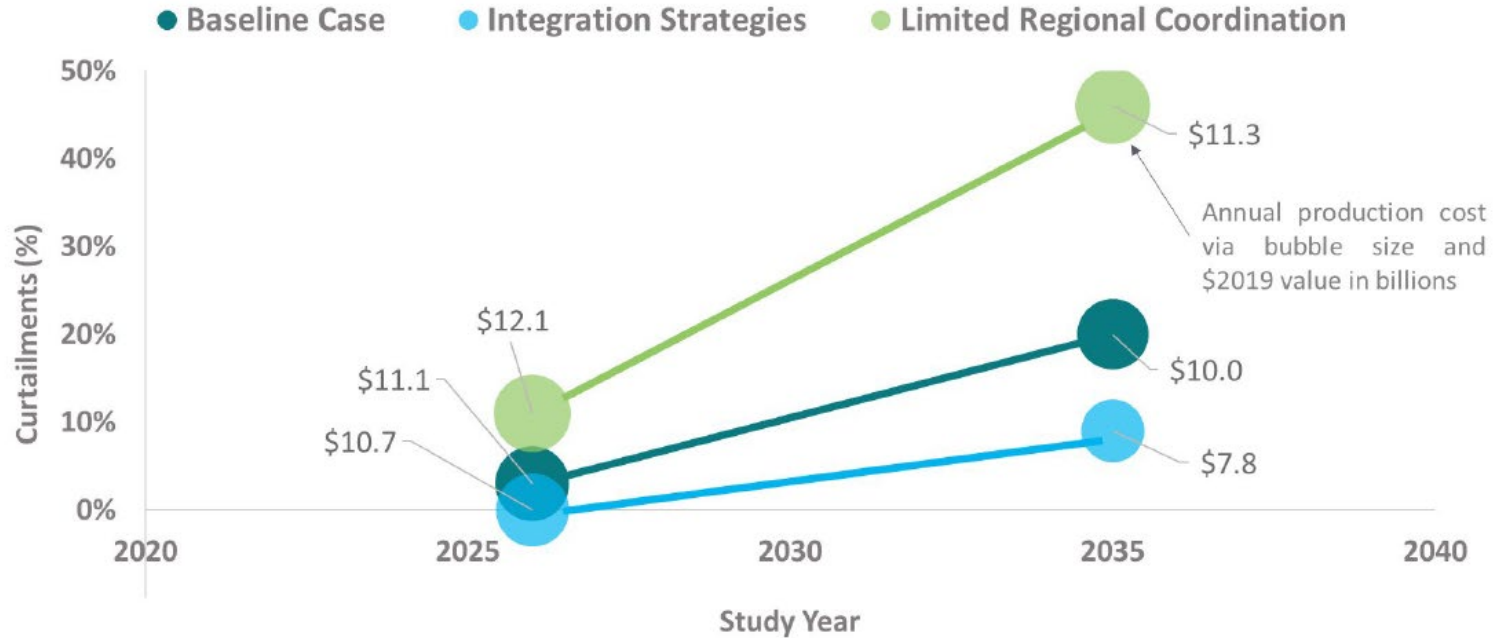
# An Organized Western Grid is Needed to Enable the Necessary Wind and Solar without Costly Curtailment



Circle size indicates interconnected renewable capacity

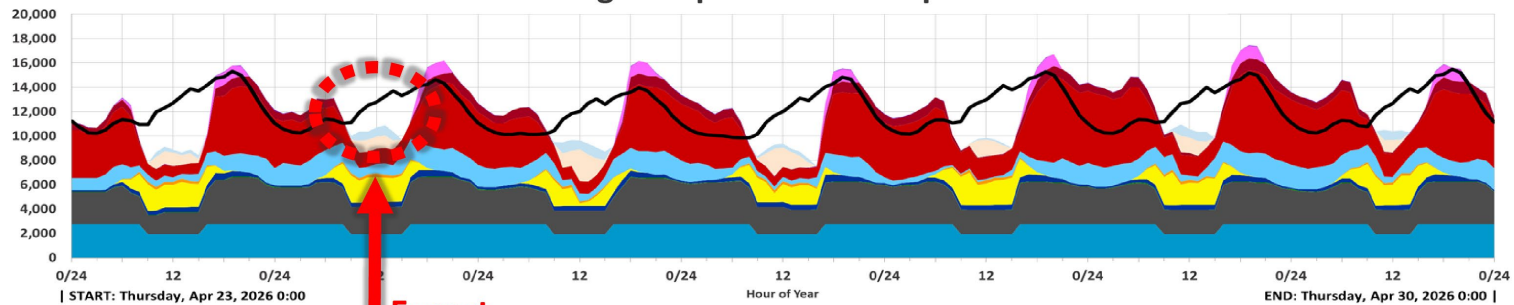


## \$ Billions Saved with a Regional Grid



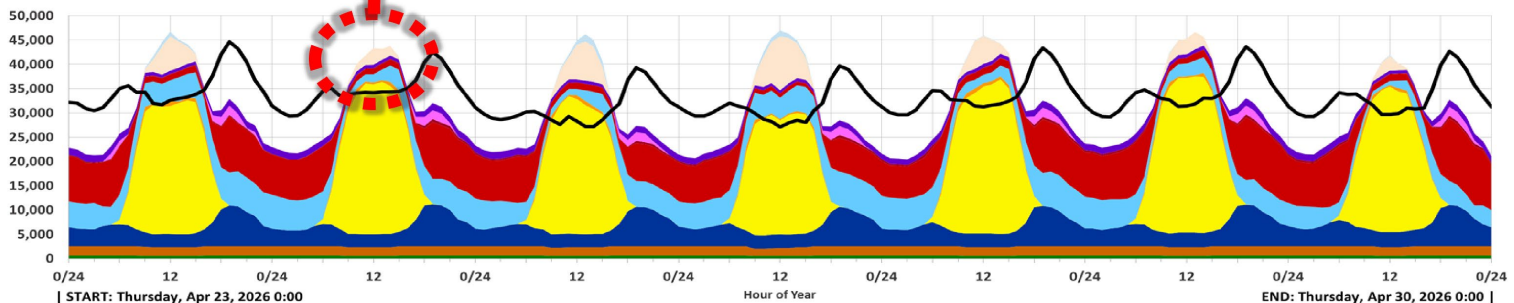
# Regional Diversity Balances Wind and Solar without Costly Curtailment

## Southwest Region Operations for April Week in 2026



**Export**

## California Region for the same week

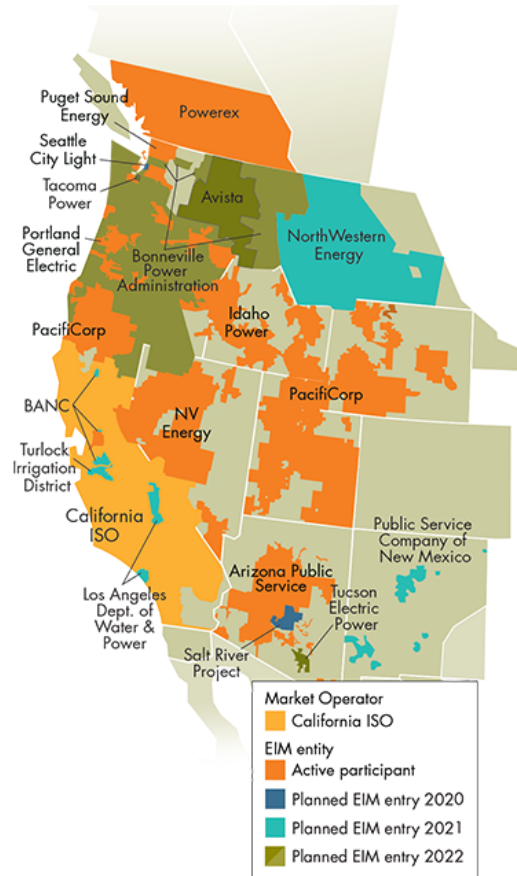


- Wind Curtail
- Solar PV Curtail
- New Storage
- Other
- BESS
- Gas CT/ST/Other
- Gas CC
- Wind
- Solar Thermal
- Solar PV
- Hydro+PS
- Geothermal
- Bio
- Coal
- Uranium
- Load

# EIM & EDAM are a Good Start; Fall Short of Needed Regional Coordination

- ❖ The Energy Imbalance Market (EIM) is a big success, savings millions for ratepayers, but is by nature only a small fraction of the market
- ❖ An EDAM for day-ahead sales would go further, but not nearly far enough
- ❖ To get 150+ GW of new wind and solar online developers need full time robust customers

## EIM Participating BAs



## Principles of Regional Coordination

- Deep decarbonization with clear GHG accounting
- Respect for state policies
- Cost containment and cost reduction for ratepayers
- Increased grid reliability and local resilience
- Robust and transparent access between customers and clean energy suppliers
- Efficient use of existing grid and coordination for new transmission
- Non-discriminatory treatment of all technologies for energy and capacity



# Utility-Scale Wind and Solar are at the Core of Climate Policy

- ❖ Utility-scale electric grid does majority of the work
- ❖ Rooftop solar contributes only marginally to climate

