

The (Limited) Wind Energy Potential in California

**Nancy Rader, Executive Director
California Wind Energy Association**

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Best Remaining Wind Resource Areas Have Been Severely Constrained

Solano County

Wind moratorium north of Hwy 12 likely to be extended due to Travis AFB concerns

Los Angeles County

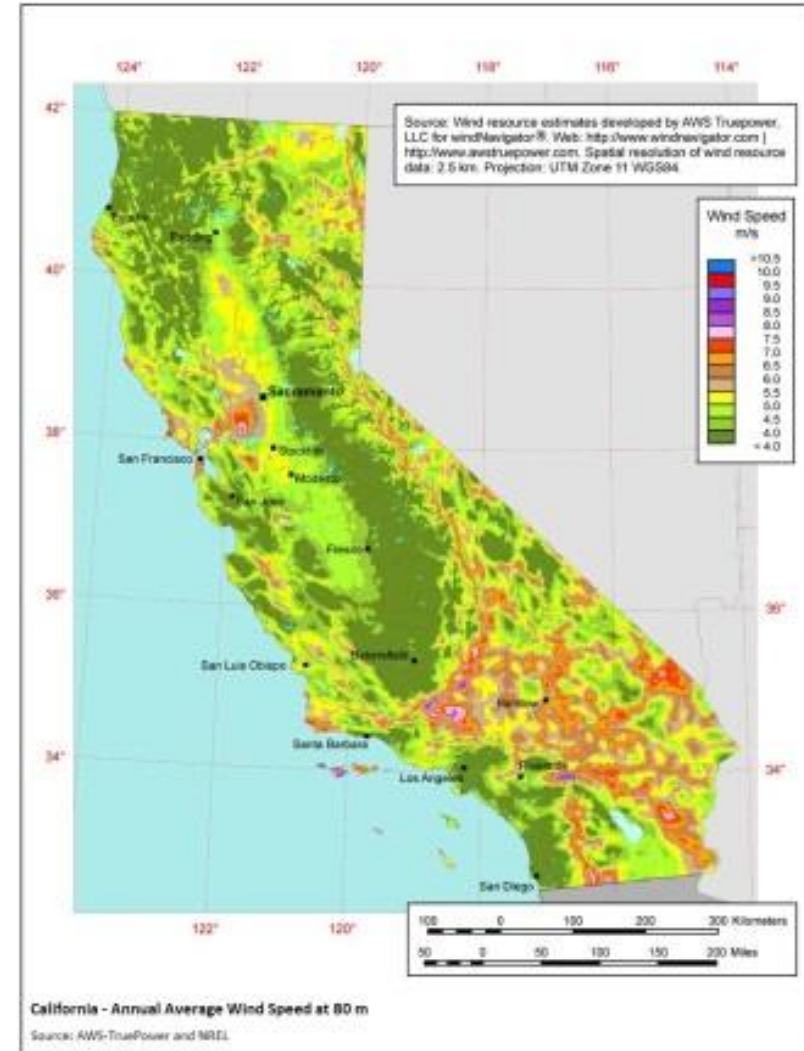
Wind energy to be prohibited in Antelope Valley area (So. of Tehachapi)

San Diego County

Unattainable sound standard

DRECP

Wind prohibited on 80% of BLM high-quality Wind Resource Areas





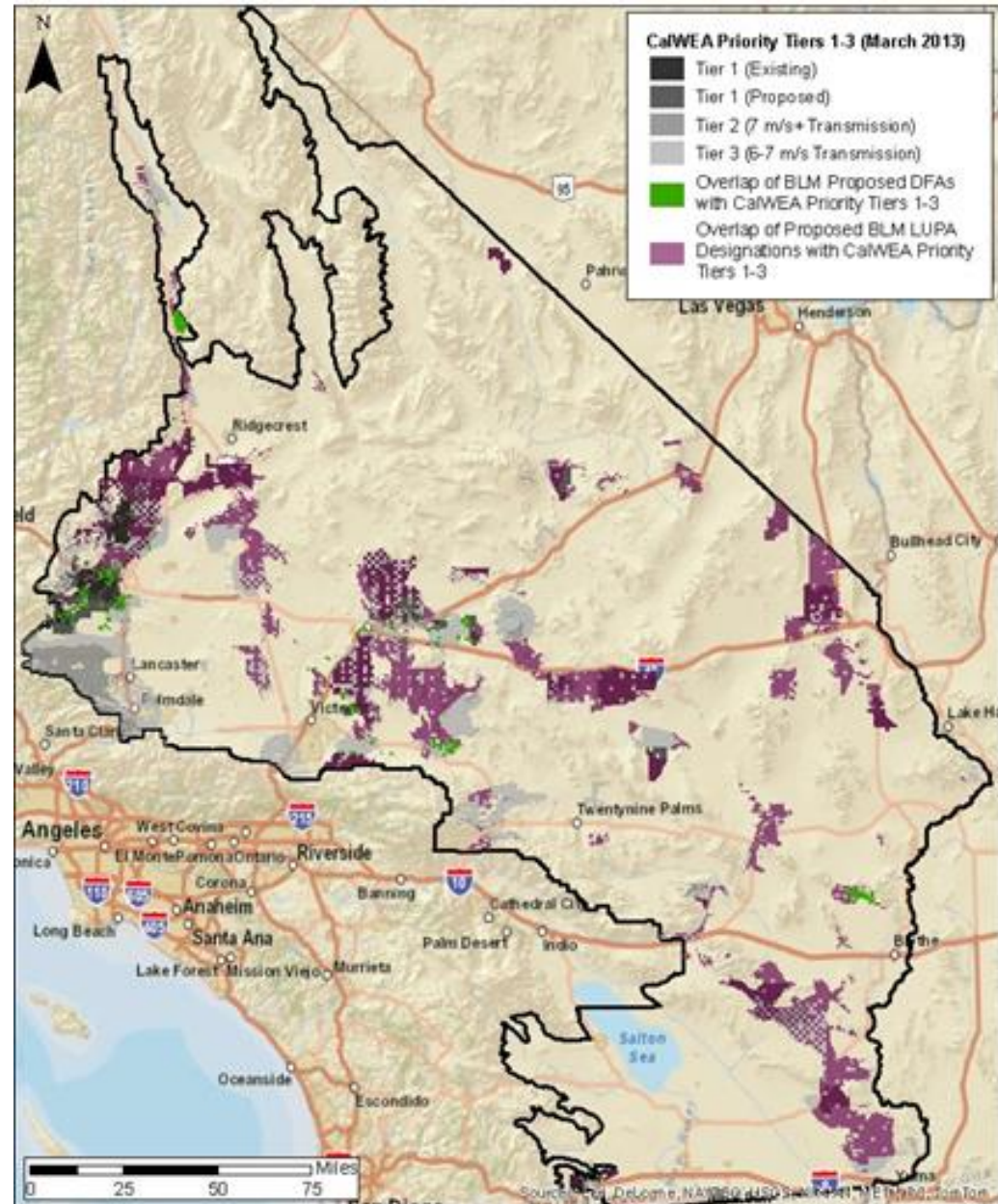
DRECP: BLM Wind Exclusions

The best wind resources within the DRECP region are shown in shades of gray.

BLM wind prohibition areas are shown in **purple**-overlay

Wind permitted in Development Focus Areas – **green**-overlay areas

CalWEA estimated max new wind potential: DRECP = 1,000 MW. All CA = 2,000 MW





Many 1980s-Vintage Wind Projects are At Risk

✦ **1,700 MW Wind Contracts Expiring 2014-2024**

- Most are 1980s-vintage PURPA contracts, 51-100 kW turbines, ~22% c.f.
- ~Half of these contracts expired prior to 2016
- ~Half will expire 2016-2023, most by 2020
- Primarily in Alameda, Contra Costa, Kern and Riverside counties

✦ **Already Repowered:**

- ~200 MW (?) occurred late-'90s (prior to PTC change)
- Approx. 300 MW repowered/in process of repowering since 2002 RPS

✦ **Not Repowered:**

- At least 700 MW (62 projects) under 50 MW
- Approx. 373 MW (38 projects) under 20 MW

*CalWEA estimates based on PG&E, SCE and SDG&E RPS Compliance Reports for 2014, filed with the CPUC; AWEA wind project database; and CPUC RPS Project Status Table (December 2015). Turbine size and capacity factors from 2008 CEC repower report (CEC-300-2008-004).



Barriers to Repowering (1)

- ✦ **Contracts expiring at a time of little RPS demand, low market prices**
- ✦ **Stiff competition from solar PV** (and larger wind projects, particularly out-of-state)
- ✦ **Significant tax policy disadvantages**
 - CA solar property tax exemption (worth 0.5 c/kWh)
 - Federal wind PTC phasing out faster than solar ITC
- ✦ **Small & fragmented projects**
- ✦ **Military height restrictions (Kern County)**



Barriers to Repowering (2)

- ✦ **Lag on the least-cost, best-fit bid evaluation components likely to favor wind**
 - integration costs, capacity value, recognition of curtailment costs
- ✦ **Timing gap**
 - despite clear need for significant wind in 2030 50% portfolio, it could be several years before repowers become competitive (if competitive vs. OOS wind)



Benefits of Repowering

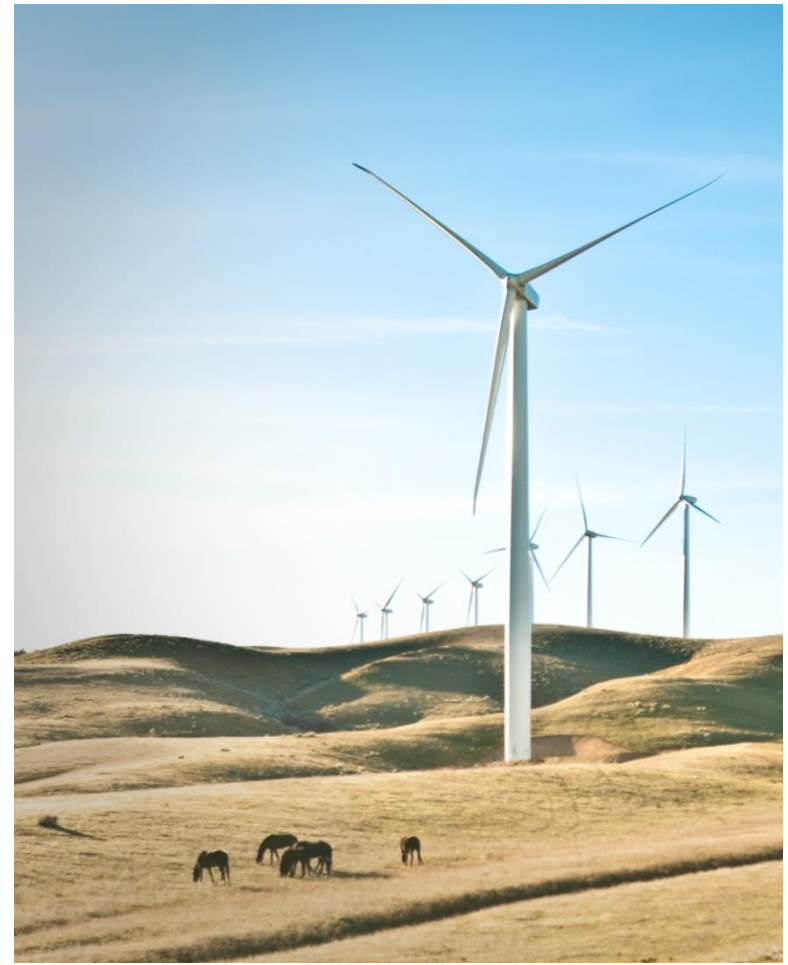
- ✦ **Efficiently use California's best wind resource areas**
 - Raise capacity factors from low-20% range to mid-to-high-30% range
 - Preserve remaining ~1,000 MW of in-state “legacy” capacity, while increasing energy by ~330-MW equivalent, for California's 50% RPS
 - No additional transmission required
- ✦ **Modern turbines bring grid benefits**
- ✦ **Environmental, tax & jobs benefits**



Thank You



1980s technology – Altamont Pass



2010s technology – Tehachapi Pass