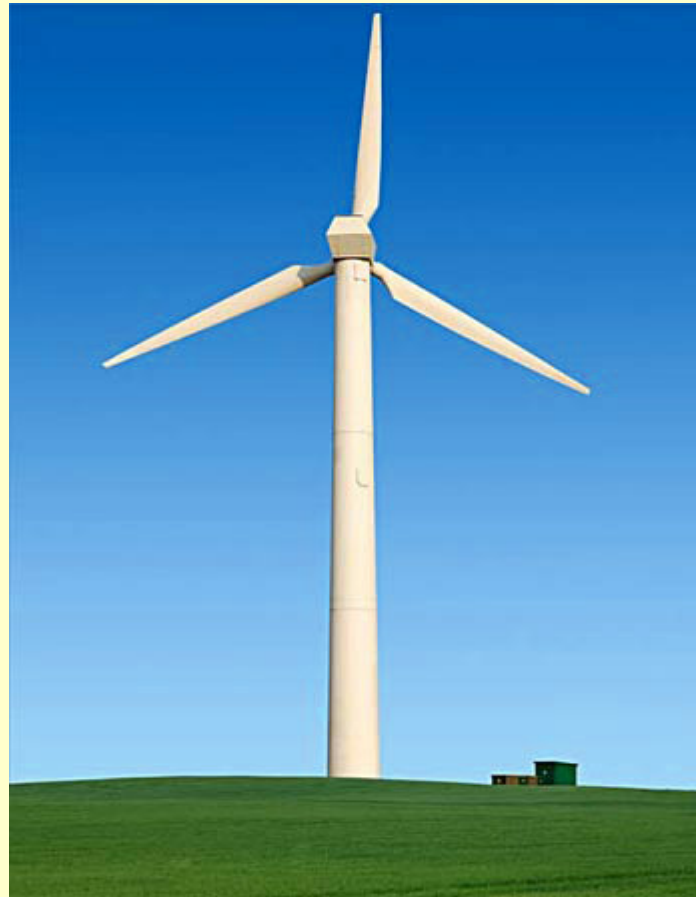


Distributed Generation Systems, Inc. (Disgen)

Dale Osborn dosborn@disgenonline.com







**Table 2.2. Existing Capacity by Energy Source, 2006
(Megawatts)**

Energy Source	Number of Generators	Generator Nameplate Capacity	Net Summer Capacity	Net Winter Capacity
Coal ^[1]	1,493	335,830	312,956	315,163
Petroleum ^[2]	3,744	64,318	58,097	62,565
Natural Gas ^[3]	5,470	442,945	388,294	416,745
Other Gases ^[4]	105	2,563	2,256	2,197
Nuclear	104	105,585	100,334	101,718
Hydroelectric Conventional ^[5]	3,988	77,419	77,821	77,393
Other Renewables ^[6]	1,823	26,470	24,113	24,285
Pumped Storage	150	19,569	21,461	21,374
Other ^[7]	47	976	882	908
Total	16,924	1,075,677	986,215	1,022,347

^[1] Anthracite, bituminous coal, subbituminous coal, lignite, waste coal, and synthetic coal.

^[2] Distillate fuel oil (all diesel and No. 1, No. 2, and No. 4 fuel oils), residual fuel oil (No. 5 and No. 6 fuel oils and bunker C fuel oil), jet fuel, kerosene, petroleum coke (converted to liquid petroleum, see Technical Notes for conversion methodology), and waste oil.

^[3] Includes a small number of generators for which waste heat is the primary energy source.

^[4] Blast furnace gas, propane gas, and other manufactured and waste gases derived from fossil fuels.

^[5] The net summer capacity and/or the net winter capacity may exceed nameplate capacity due to upgrades to and overload capability of hydroelectric generators.

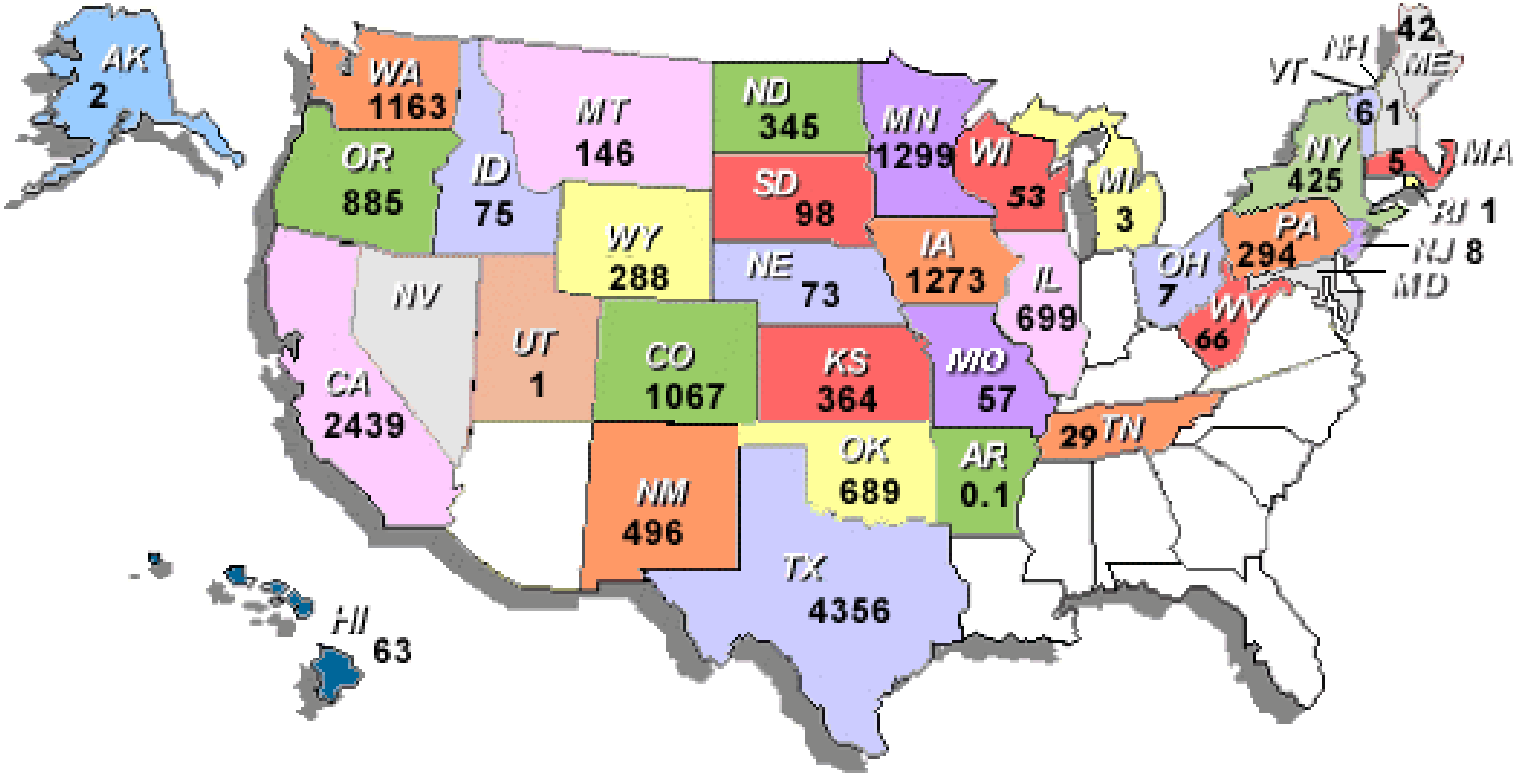
^[6] Wood, black liquor, other wood waste, municipal solid waste, landfill gas, sludge waste, tires, agriculture byproducts, other biomass, geothermal, solar thermal, photovoltaic energy, and wind.

^[7] Batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, tire-derived fuels and miscellaneous technologies.

Notes: Capacity by energy source is based on the capacity associated with the energy source reported as the most predominant (primary) one, where more than one energy source is associated with a generator. Totals may not equal sum of components because of independent rounding.

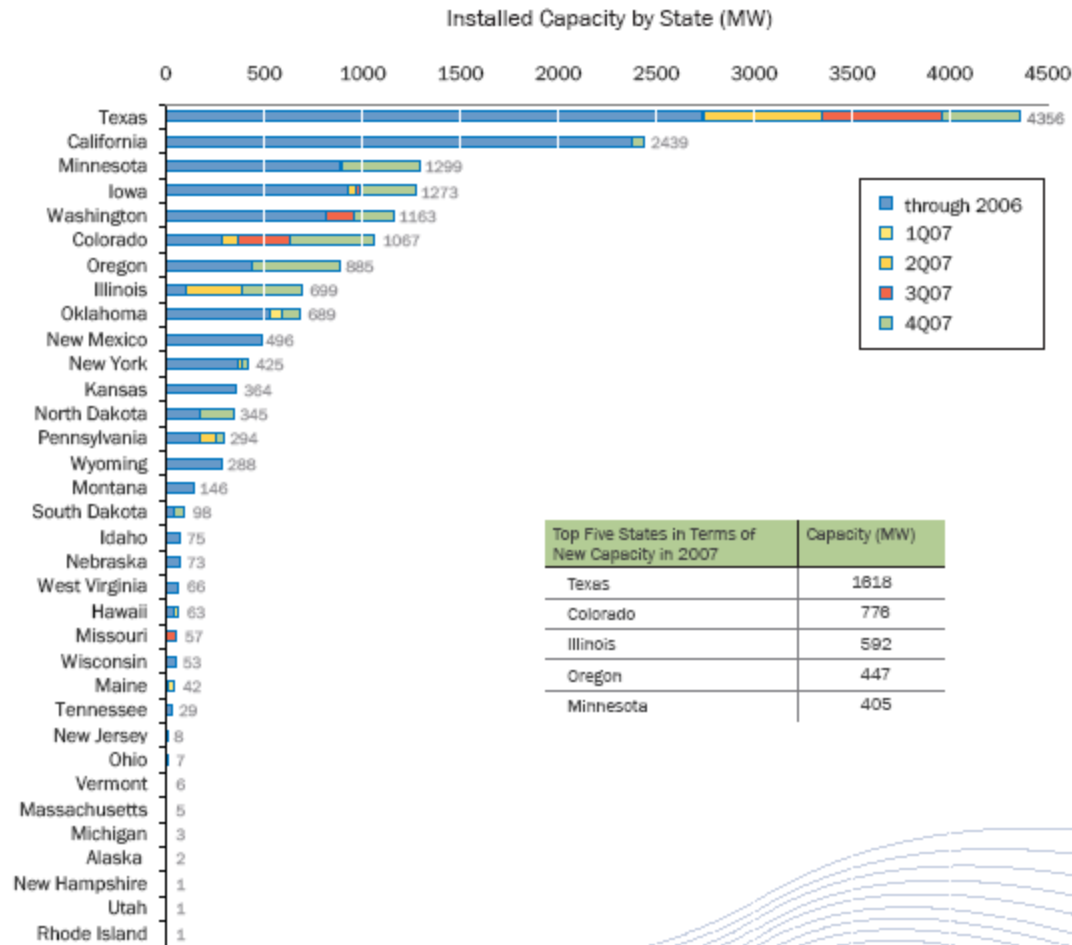
Source: Energy Information Administration, Form EIA-860, "Annual Electric Generator Report."

Wind Capacity Installed Megawatts (MW) By Each State.



Installed Capacity by State

Chart 2 illustrates the rankings of wind power capacity all states with "utility sized" wind turbines. AWEA considers "utility-sized" to be all wind turbines with generators 100-kilowatt (kW) in size or larger.

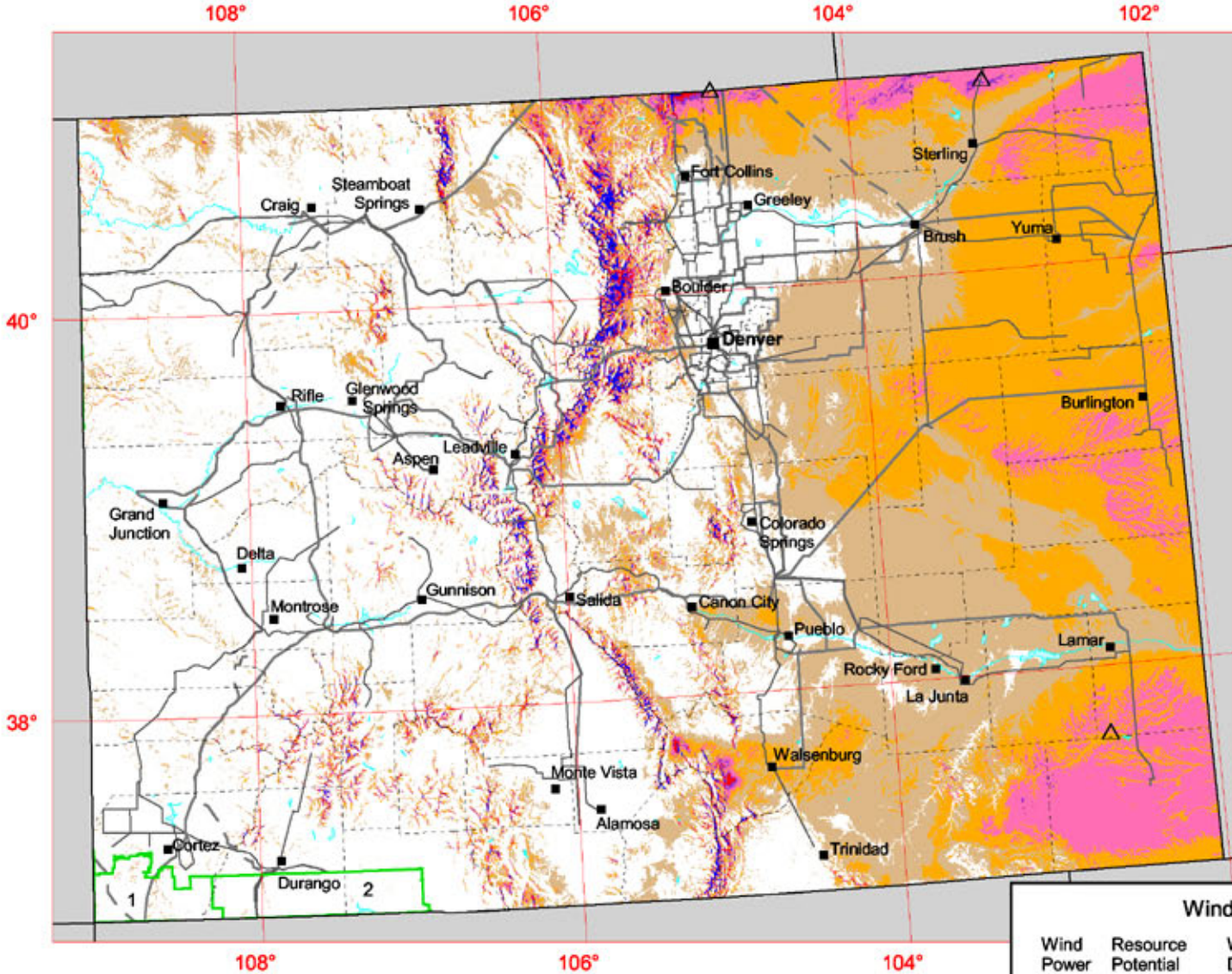


National Goals

- 20% Capacity by 2020 in renewable generation
- About 950,000 MW non-renewable
- Renewable generation currently installed 17,000 MW
- About 1.8% currently
- To achieve the goal, an additional 170,000 MW are needed; about 14,000 MW per year on average
- Exponential growth may achieve that; but unlikely
 - Costs for wind energy have increased, not decreased
 - Transmission capacity is severely limited
 - Eventually, there will be consumer resistance

Colorado

50 m Wind Power



Transmission Line*
Voltage (kV)

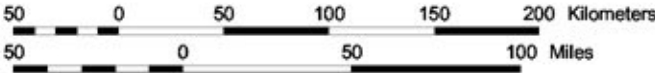
- 115 - 161
- 230
- - 345

* Source: POWERmap, ©2003 Platts, a Division of the McGraw-Hill Companies

The annual wind power estimates for this map were produced by TrueWind Solutions using their Mesomap system and historical weather data. It has been validated with available surface data by NREL and wind energy meteorological consultants.

Wind Power Classification				
Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m ²	Wind Speed ^a at 50 m m/s	Wind Speed ^a at 50 m mph
1	Poor	0 - 200	0.0 - 5.9	0.0 - 13.2
2	Marginal	200 - 300	5.9 - 6.7	13.2 - 15.0
3	Fair	300 - 400	6.7 - 7.4	15.0 - 16.6
4	Good	400 - 500	7.4 - 7.9	16.6 - 17.7
5	Excellent	500 - 600	7.9 - 8.4	17.7 - 18.8
6	Outstanding	600 - 800	8.4 - 9.3	18.8 - 20.8
7	Superb	> 800	> 9.3	> 20.8

^a Wind speeds are based on a Weibull k of 2.0 at 1500 m elevation.



Indian Reservation

- 1 Ute Mountain
- 2 Southern Ute



U.S. Department of Energy
National Renewable Energy Laboratory



The Un-served Market

- Locations where the wind blows strong; but no transmission is available
- Locations where the energy needs are $< 20\text{MW}$ and the citizens want some control over energy supply
- Locations where people are concerned about long-term costs
- Locations where people want to “Go Green”
- Locations where citizens want to realize the economic value of capital investments
- Locations where quality of electric service is an issue

Community Wind

- Comparatively small projects; < 20 MW
- Uses existing infrastructure; no new transmission
- Economically competes with delivered cost of energy
- Opportunity for local investors
 - Local maintenance providers
- Basic requirements are the same as large projects
 - Land rights
 - Good wind resource
 - Land use permits
 - Interconnection rights
 - Power sales agreement

Community Wind

- Issues:
 - Who are the Owners (community or investors?)
 - If the community ownership is tax-exempt, is a profit expected?
 - Is the objective economic or environmentally driven?
 - Turbine sizes, costs and logistics favor very large projects
 - 550-650 Ton crane (mobilization \$150,000)
 - 450 cubic yards of concrete per foundation
 - 23 tons of rebar per foundation
 - **Tax rules stack the deck against Community Wind**
 - Must use Federal Tax Credits to have competitive cost of energy
 - Tax Credits are not transferable
 - Renewable Energy Production Incentive (REPI) to tax-exempt entities grossly under-funded and typically not financeable

What To Do

- Country Proverb:
“If you keep doin what you’re doin, you’ll keep gettin what your gettin”
- Re-define tax policy to support Community Wind
 - Make federal tax benefits transferable
 - Firm REPI payments so they are predictable and financeable
- Continue to regulate utilities forcing changes in mindsets
- Plan for disruptive technologies
 - One half the capital cost
 - One third the installation cost
 - Local maintenance

What To Do

Keep The Education Going:

Elected Officials; Federal and State

(There have been no meaningful changes in renewable deployment without regulatory or legislative action)

Utilities; investor owned and rural

Local Officials and Leaders must become informed

Legislative action to resolve the PTC and REPI issues