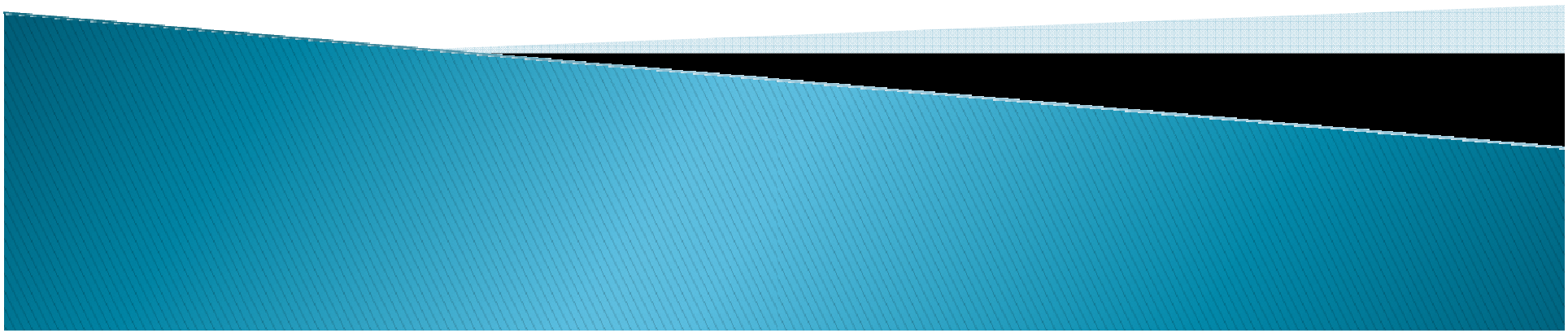
A Walk in the Wind

IRWA Chapter 67, Spring Seminar
May 11, 2010
Cliff Clement
Third Planet Windpower

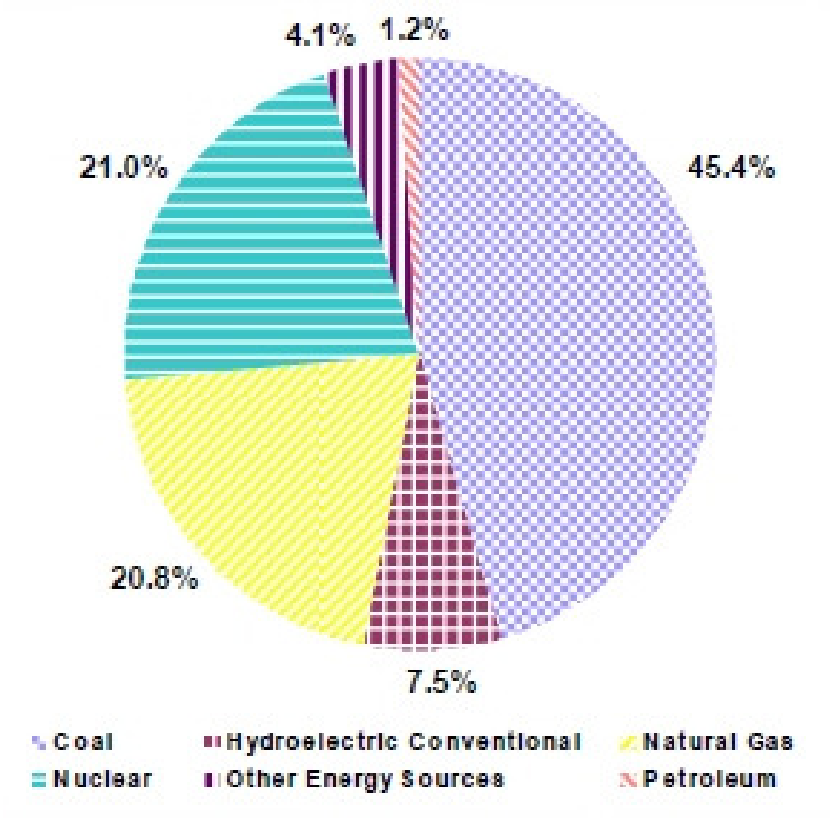


Third Planet Windpower

- Third Planet Windpower was founded in 2006, and is a privately held wind energy company
- 200,000+ Acres under Easement
- TPW has a 100.5 MW facility in in West Texas which commenced operations February 2010.
- Commencing construction on a 40.5 mw facility in central Nebraska in May 2010.

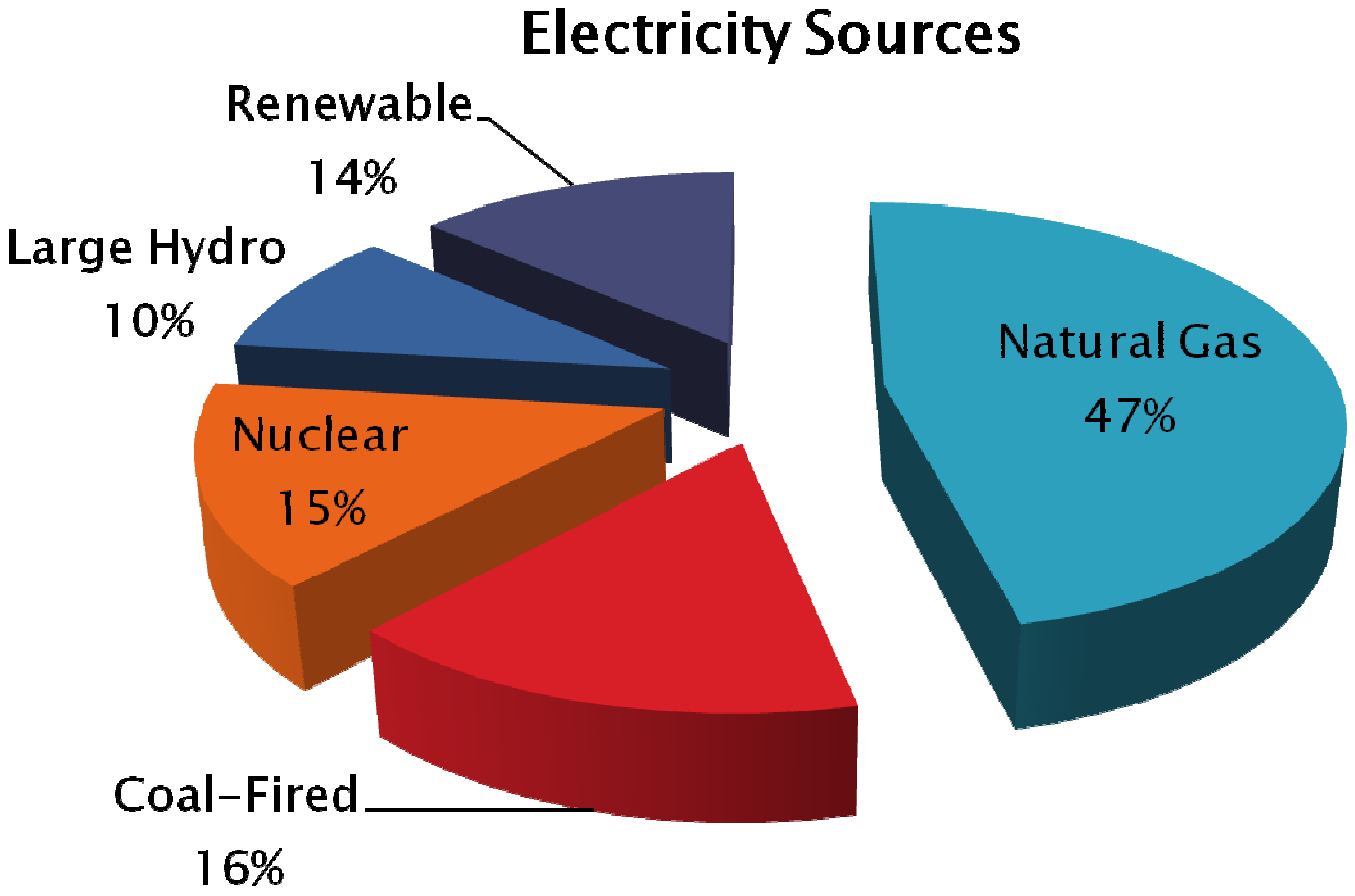
RENEWABLE ENERGY

US ENERGY SOURCES FOR ELECTRICITY GENERATION



source DOE

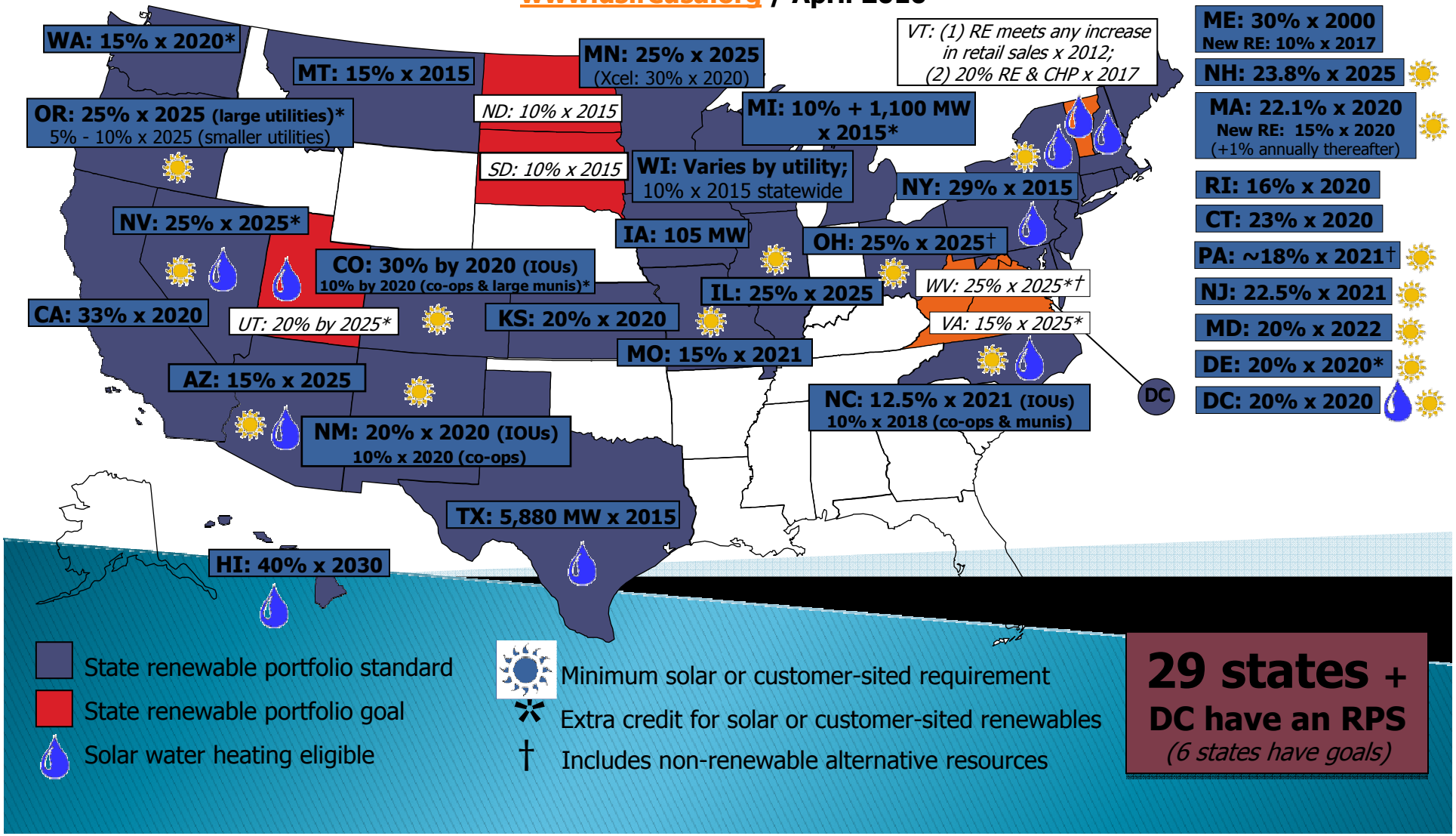
California Electricity Sources



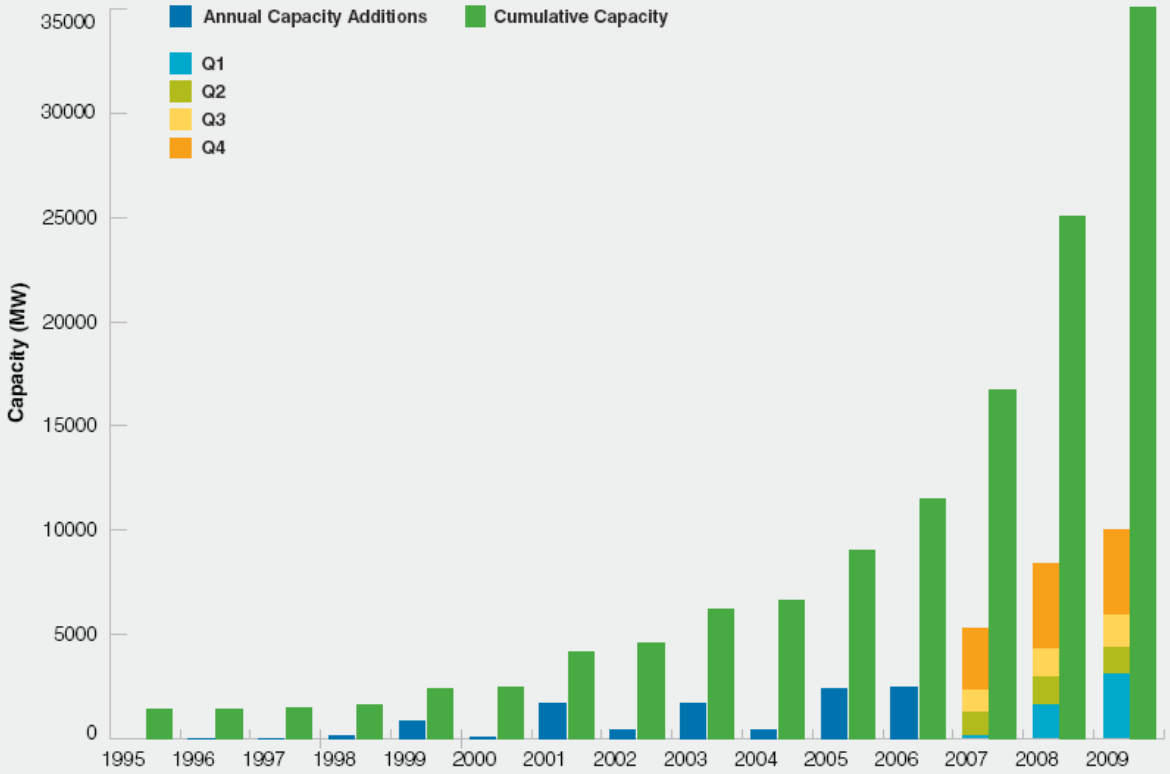
Source: California Energy Commission

Renewable Portfolio Standards

www.dsireusa.org / April 2010



U.S. ANNUAL AND CUMULATIVE WIND POWER CAPACITY GROWTH

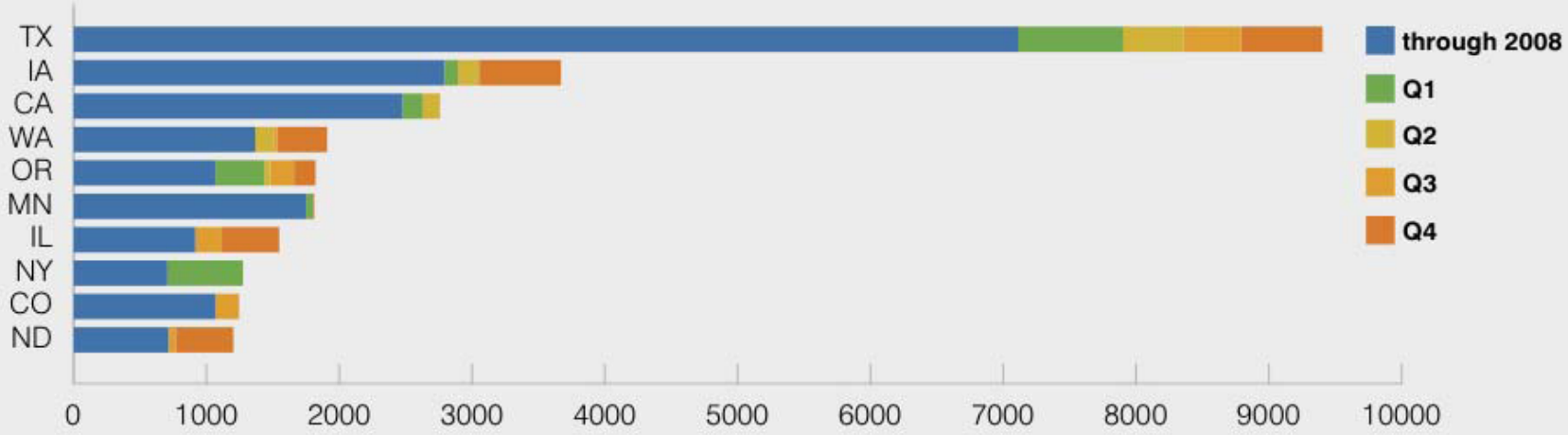


Year	Annual Capacity Additions (MW)	Cumulative Capacity (MW)
Through end 1995		1416
1996	1	1417
1997	17	1434
1998	140	1574
1999	819	2394
2000	67	2460
2001	1691	4151
2002	412	4563
2003	1670	6233
2004	397	6629
2005	2385	9014
2006	2462	11476
2007	5258	16725
2008	8366	25076
2009	10010	35086

Installation figures for years 2006 - 2009 (annual and cumulative) include capacity for installed turbines under 100 kW, whereas earlier years may not. The small wind report tracks sales of wind turbines 100-kW and below. The utility scale wind power projects database tracks turbine installations 100-kW and above. 100-kW turbine sales were subtracted from the small wind report total to avoid double counting. Data has changed slightly from the 2008 Wind Industry Report due to small decommissionings, changes in how the data was reported and other changes provided by companies.

Source: American Wind Energy Association

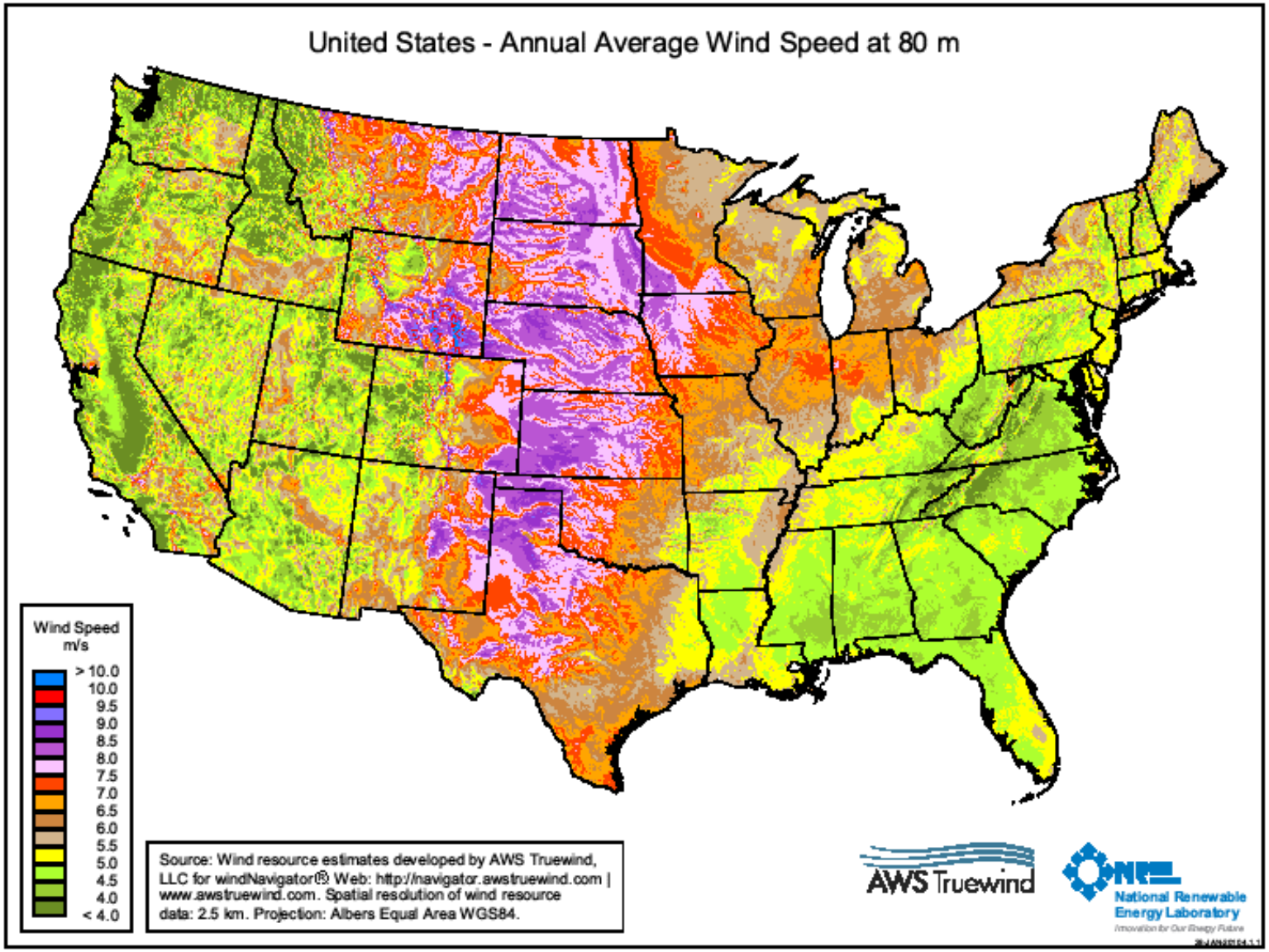
U.S. WIND POWER CAPACITY INSTALLATIONS BY STATE



Most Capacity Additions	Capacity (MW)
Texas	2292 MW
Indiana	905 MW
Iowa	879 MW
Oregon	754 MW
Illinois	632 MW

Fastest Growing	Growth
Arizona	first utility-scale project
Utah	1000%
Indiana	700%
Maine	275%
Rhode Island	250%

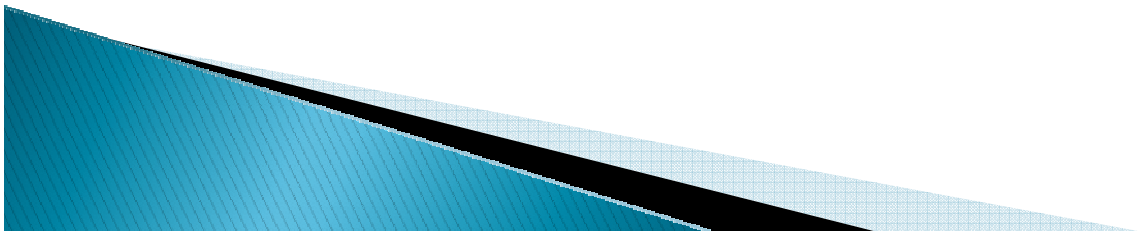
Source: American Wind Energy Association


United States - Annual Average Wind Speed at 80 m
Wind Speed
m/s
> 10.0
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
< 4.0
Source: Wind resource estimates developed by AWS Truewind, LLC for windNavigator® Web: http://navigator.awstruewind.com | www.awstruewind.com. Spatial resolution of wind resource data: 2.5 km. Projection: Albers Equal Area WGS84.
AWS Truewind
National Renewable Energy Laboratory

California Wind Resource Map – Mean Annual Wind Speed at 100 Meters

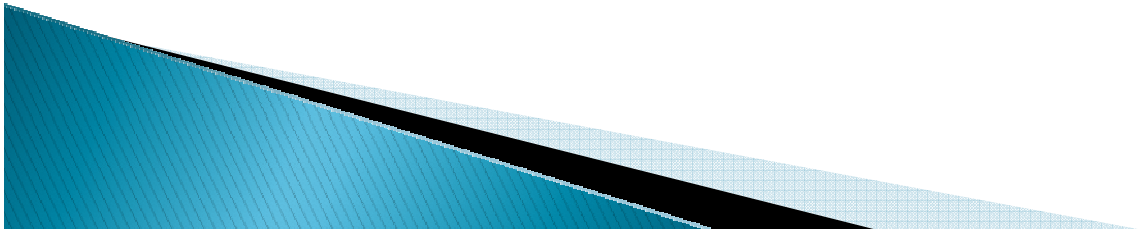
Location of Transmission Line

- Distance from Transmission Line
- Size of Transmission Line
- Available Space



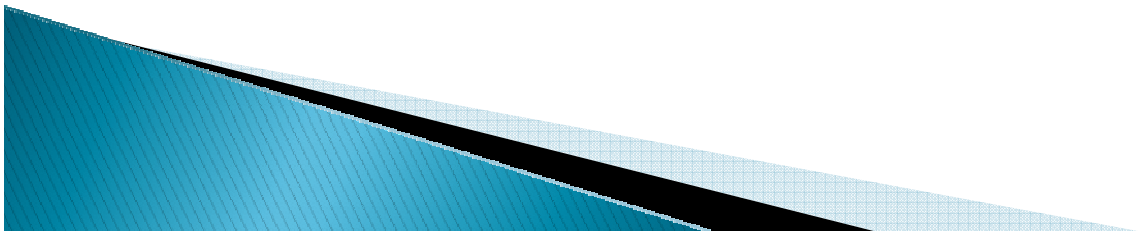
Secure Land Rights

- Concerned with surface ownership
- 80 to 100 acres per turbine
- Negotiate terms of lease
  - Royalty
  - Roads
  - Collection and Transmission Lines
  - Substations
  - O&M Buildings
  - Turbines



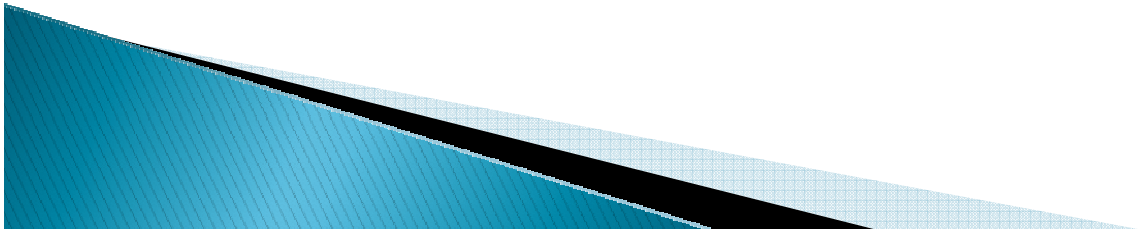
Identify Market

- Who needs the power?
- Utilities seek the lowest cost option
- Highly Competitive among developers



Siting Concerns

- Endangered or protected species
- Site geotech
- Noise and aesthetics issues
- Obstruction with flight path of local air traffic and radar
- Local and State Zoning and Regulations



Turbine Technology

- Right Turbine for Right Wind Resource
- Bank acceptance of turbines
- Up to 2 year window for ordering new turbines

Loraine Windpark Project, LLC Loraine Texas

Loraine Windpark Project, LLC

- 40,000 acres – Mitchell County Texas
- 185 landowners – landowners must approve infrastructure location. 800 ft from any residence, barn, corral or building, 300 feet from any well, irrigation line or other infrastructure. Must have landowner approval to impact pivot irrigation. No overhead lines without permission.
- 45 different crossing permits (roads, pipelines, rail road, transmission lines).
- 250 MWs – 167 GE 1.5 SLE Turbines
- Started Construction 12/1/2008
- COD 10/15/2009
  - 250 MWs, First phase of 100.5 MW with COD January 2010.
  - Second phase of 150 MW with COD expected 4Q 2010.

Road Construction

- Approximately 178, 813’ (33.9 miles) of roads.
- Must meet engineering standards for delivery of major equipment
- Construction Roads are 38’ in width and turned back to 18’ feet after construction

Foundation Information

- Foundations excavated are to a 6’8” depth and are 58’ x 58’
- 39,000 pounds of rebar in each foundation
- 238 yards of concrete in each foundation – continuous pour.
- Majority of foundations are 48’ in diameter and 7’3” tall

Pad Mount Transformers

- 1 pad mount transformer at each turbine site
- Transformers convert voltage from 690V to 34.5 kV for the collection system

Trenching Information

- 5 wires buried in each trench
  - 3 Conductors carrying electricity (4 inches in diameter)
  - 1 Communications line
  - 1 Ground Wire

- Wires are buried 48” below surface

Turbine General Information

TURBINE & ROTOR	WEIGHT		LENGTH
Hub Assembly	37500 #		
Blades	13900 #		121.4’
Rotor – 77 Meter rotor 1.5SLE	79400 #		252.6’
Machine head w/fixture	126000#		
TOWER			
Base Section T-Flange	126766#	73.2’	15’
Middle Section	83445#	82’	14.1’
Top Section	65936#	98-4’	11.2’
TOTAL WEIGHT	276147#		

TURBINE GENERAL INFORMATION

COMPONENTS
WEIGHT

Down Tower Controller
8,375#

Gearbox SLE/SE
34,833#

Generator
18,629#

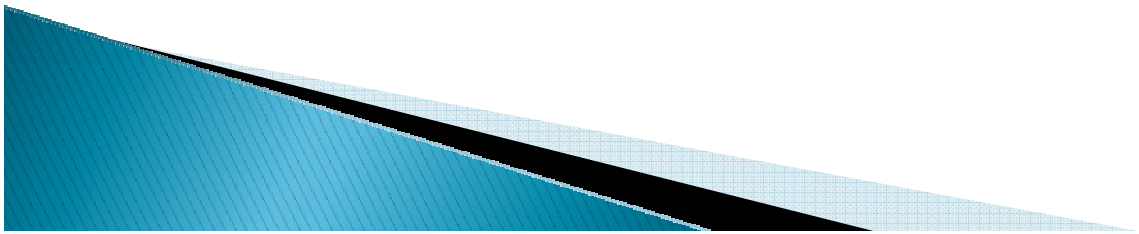
Main Bearing
4,630#

Yaw Drive
1,135#

Main-Shaft
14,551#

SUBSTATION

- Main collection point for all electricity generated by the wind turbines
- Transformers at substation convert voltage a second time from 34.5 kV to 345 kV




Saving the planet...
with clean energy
Third Planet
Windpower