
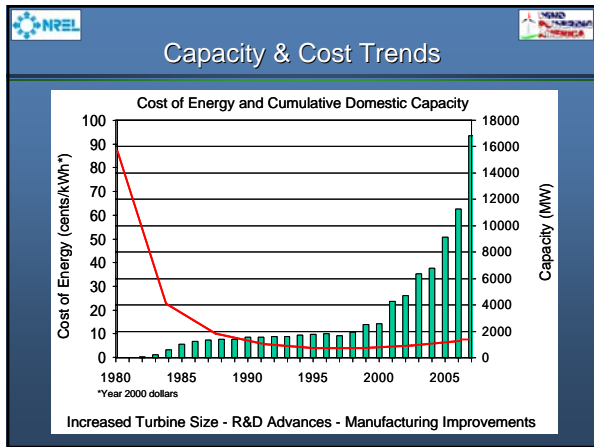
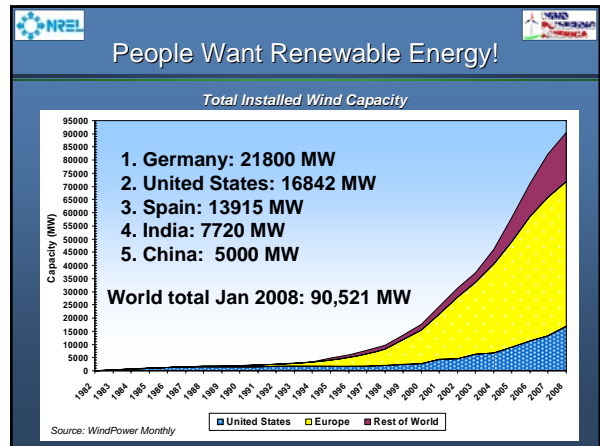


## Wind Energy Update



Larry Flowers  
National Renewable Energy Laboratory  
January 23, 2008

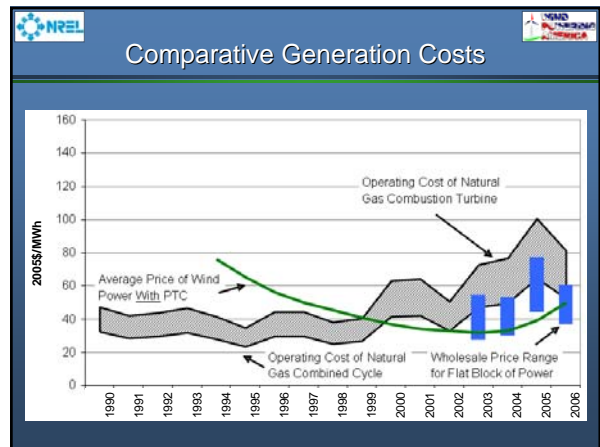
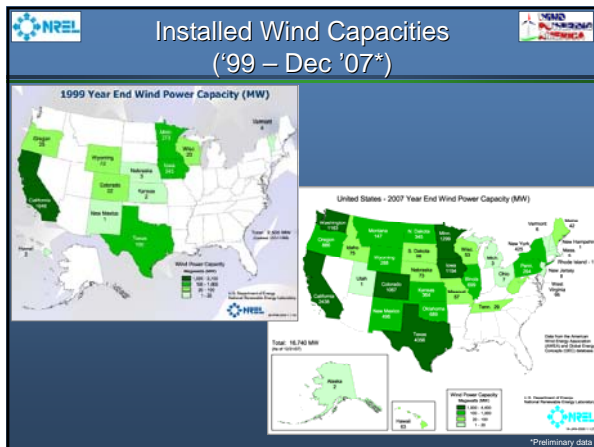


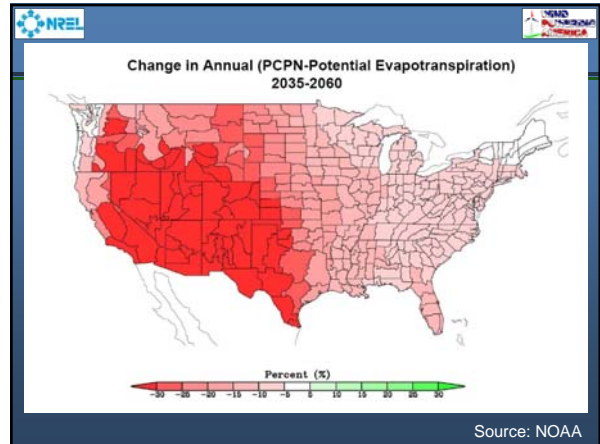
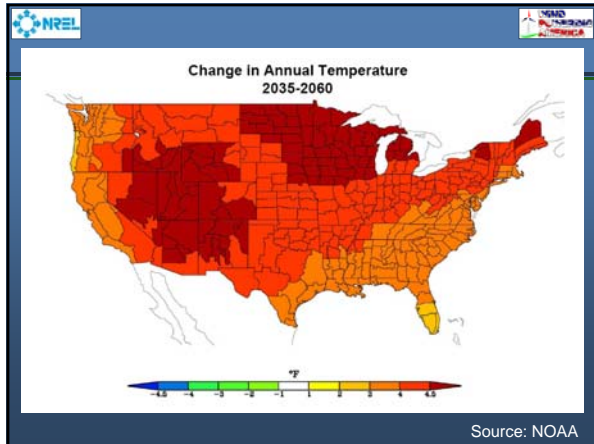
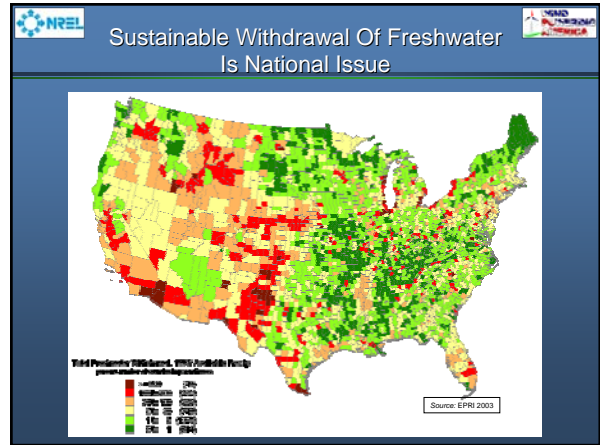
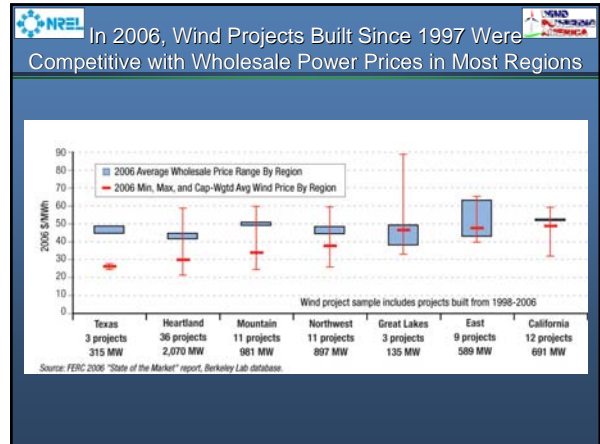
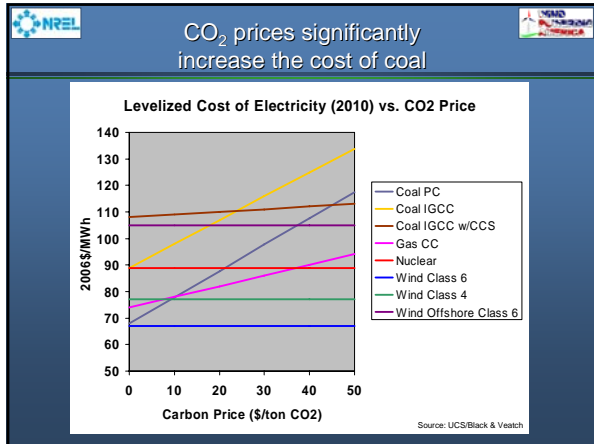
## U.S. Leads World in Annual Wind Capacity Additions; Second in Cumulative Capacity

### International Rankings of Wind Power Capacity

Cumulative Capacity (end of 2007, MW)		Incremental Capacity (2007, MW)	
Germany	21,800	United States	5,144
United States	16,842	China	2,406
Spain	13,915	Spain	2,300
India	7,720	India	1,450
China	5,000	Germany	1,178
Denmark	3,132	France	1,155
France	2,624	Portugal	494
Rest of World	19,488	Rest of World	5,248
<b>Total</b>	<b>90,521</b>	<b>Total</b>	<b>19,375</b>

Data source: Windpower Monthly Windicator, January 2008



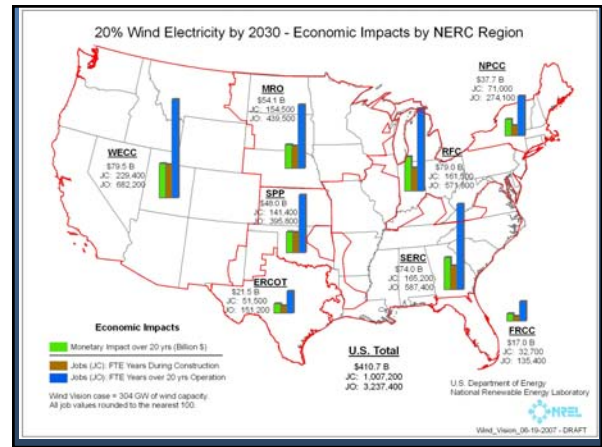
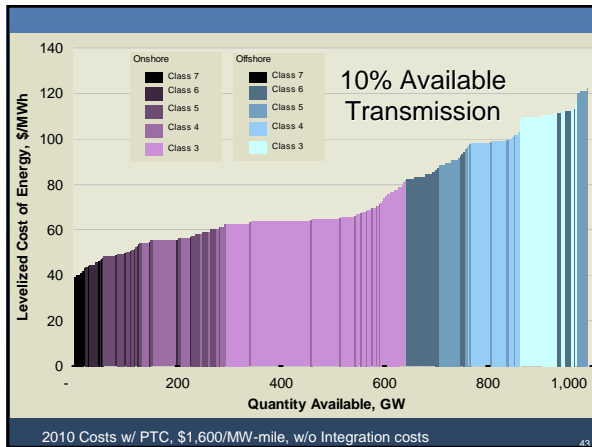
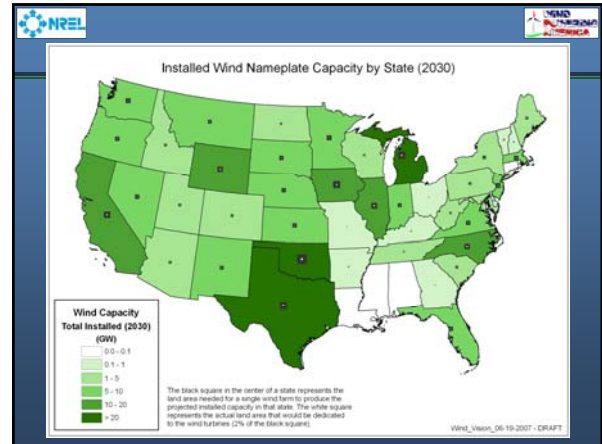


**A New Vision  
For Wind Energy in the U.S.**



**State of the Union Address**  
 "...We will invest more in ...  
**revolutionary and...wind technologies**"

**Advanced Energy Initiative**  
 "Areas with good wind resources have the potential to **supply up to 20% of the electricity** consumption of the United States."

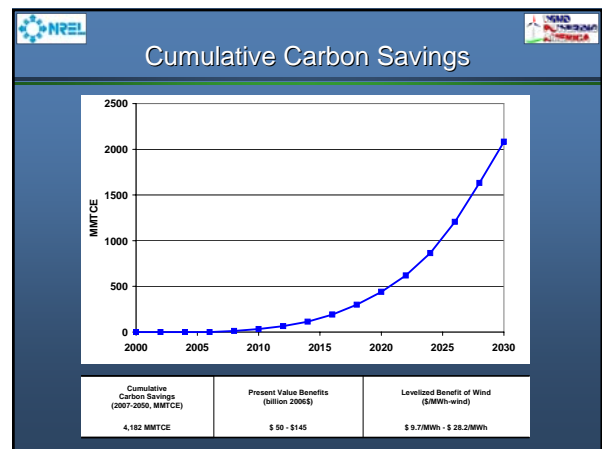
**Montana – Economic Impacts**  
 From the 20% Scenario  
 5,261 MW new development

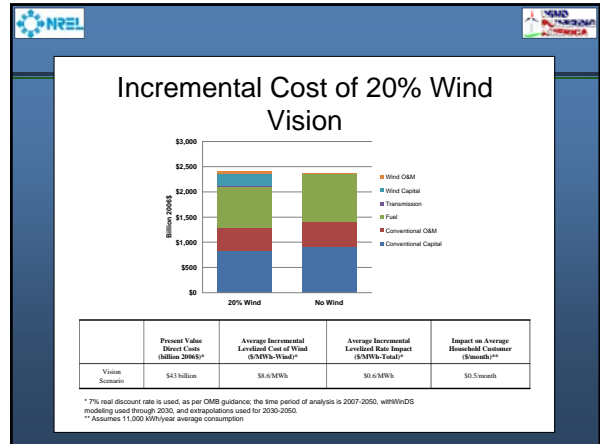
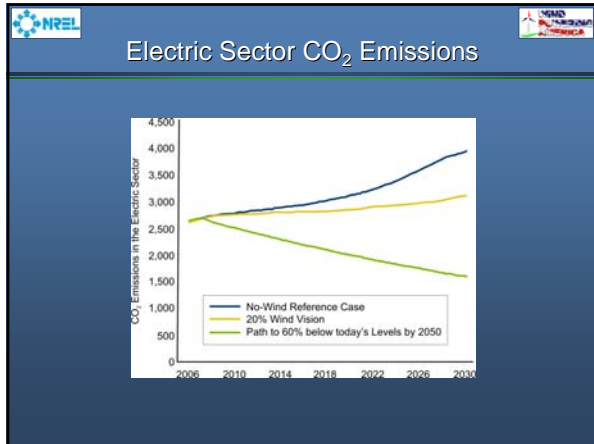
*Wind energy's economic "ripple effect"*

Direct Impacts	Indirect & Induced Impacts	Totals (construction + 20 yrs)
<b>Payments to Landowners:</b> • \$15 Million/yr <b>Local Property Tax Revenue:</b> • \$80 Million/yr <b>Construction Phase:</b> • 9,000 new jobs • \$990 M to local economies <b>Operational Phase:</b> • 1,400 new long-term jobs • \$110 M/yr to local economies	<b>Construction Phase:</b> • 7,900 new jobs • \$620 M to local economies <b>Operational Phase:</b> • 1,500 local jobs • \$120 M/yr to local economies	<b>Total economic benefit = \$6.2 B</b> <b>New local jobs during construction = 16,900</b> <b>New local long-term jobs = 2,900</b>

All jobs rounded to the nearest hundred jobs; Millions of dollars greater than 10 million are rounded to the nearest five million

Construction Phase = 1-2 years  
 Operational Phase = 20+ years





### Results: Costs & Benefits

Incremental direct cost to society	<b>\$43 billion</b>
Reductions in emissions of greenhouse gasses and other atmospheric pollutants	825 M tons (2030) <b>\$98 billion</b>
Reductions in water consumption	8% total electric 17% in 2030
Jobs created and other economic benefits	140,000 direct <b>\$450 billion total</b>
Reductions in natural gas use and price pressure	11% <b>\$150 billion</b>
<b>Net Benefits: \$205B + Water savings</b>	

