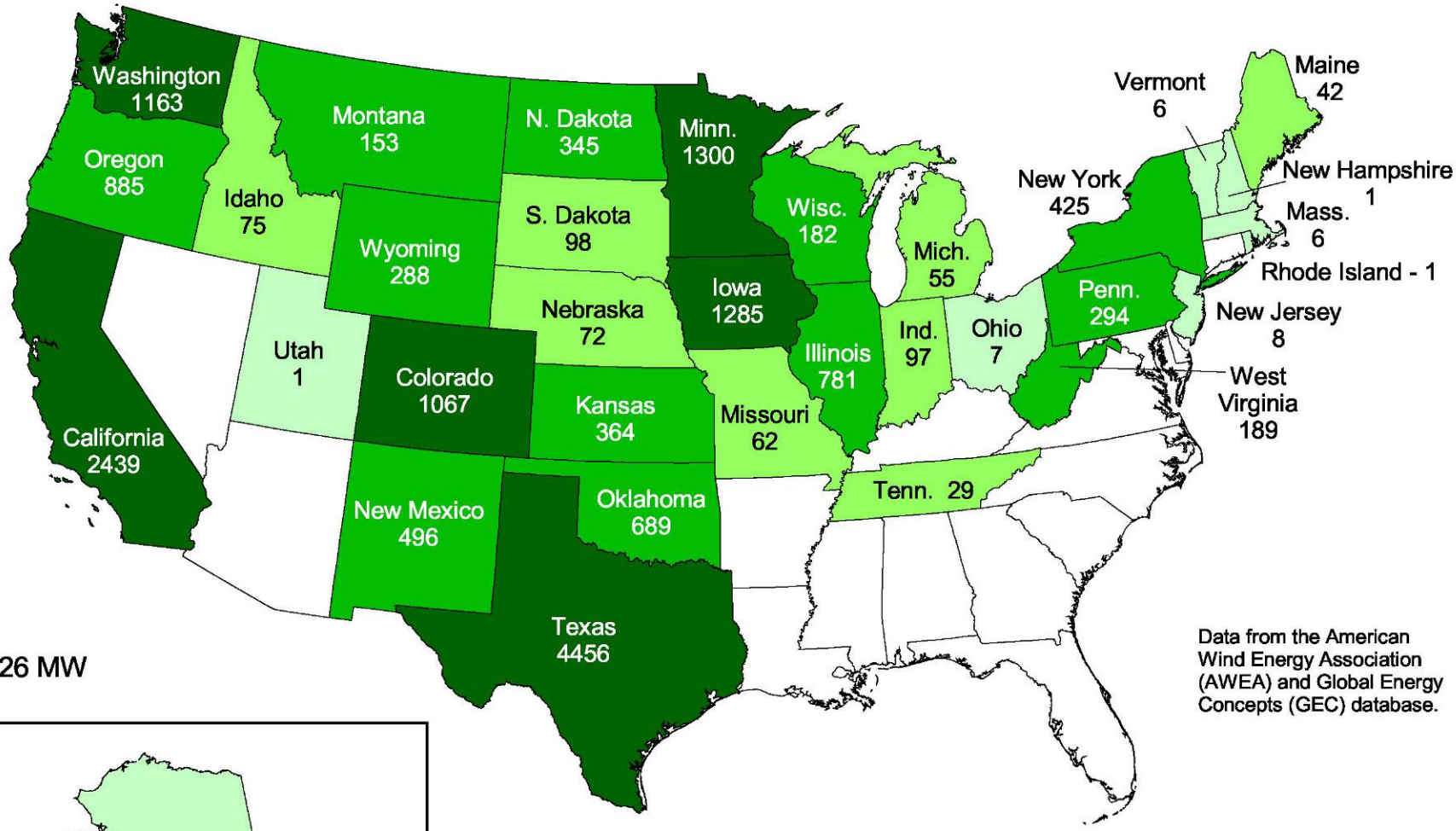
Overview of Wind Energy Policies

Lori Bird, NREL
lori_bird@nrel.gov

Missouri Wind Energy Forum
September 15, 2008

United States - Current Installed Wind Power Capacity (MW)



Total: 17,426 MW
(As of 4/30/08)

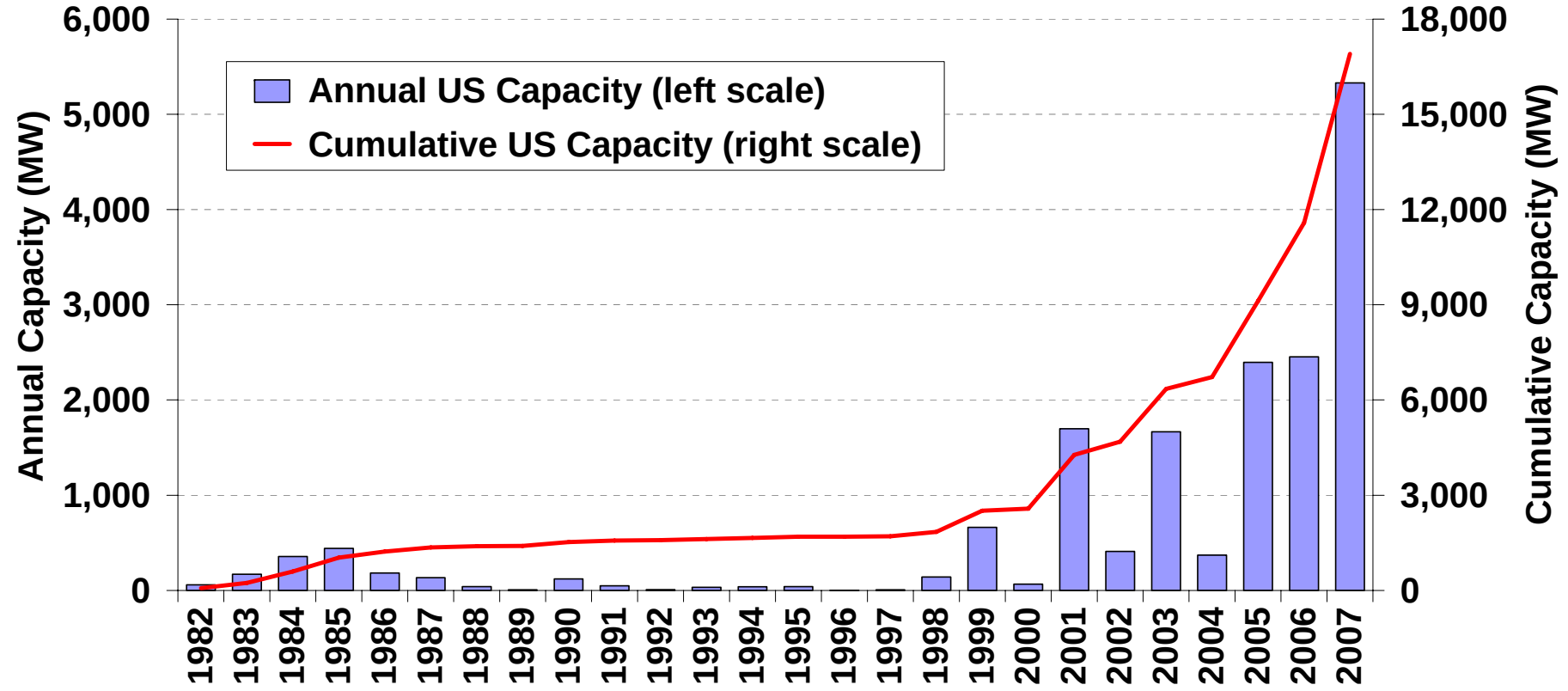
Data from the American Wind Energy Association (AWEA) and Global Energy Concepts (GEC) database.

U.S. Department of Energy
National Renewable Energy Laboratory

NREL

16-JUN-2008

U.S. Wind Power Capacity Trend



Source: AWEA

Record year for new U.S. wind capacity:

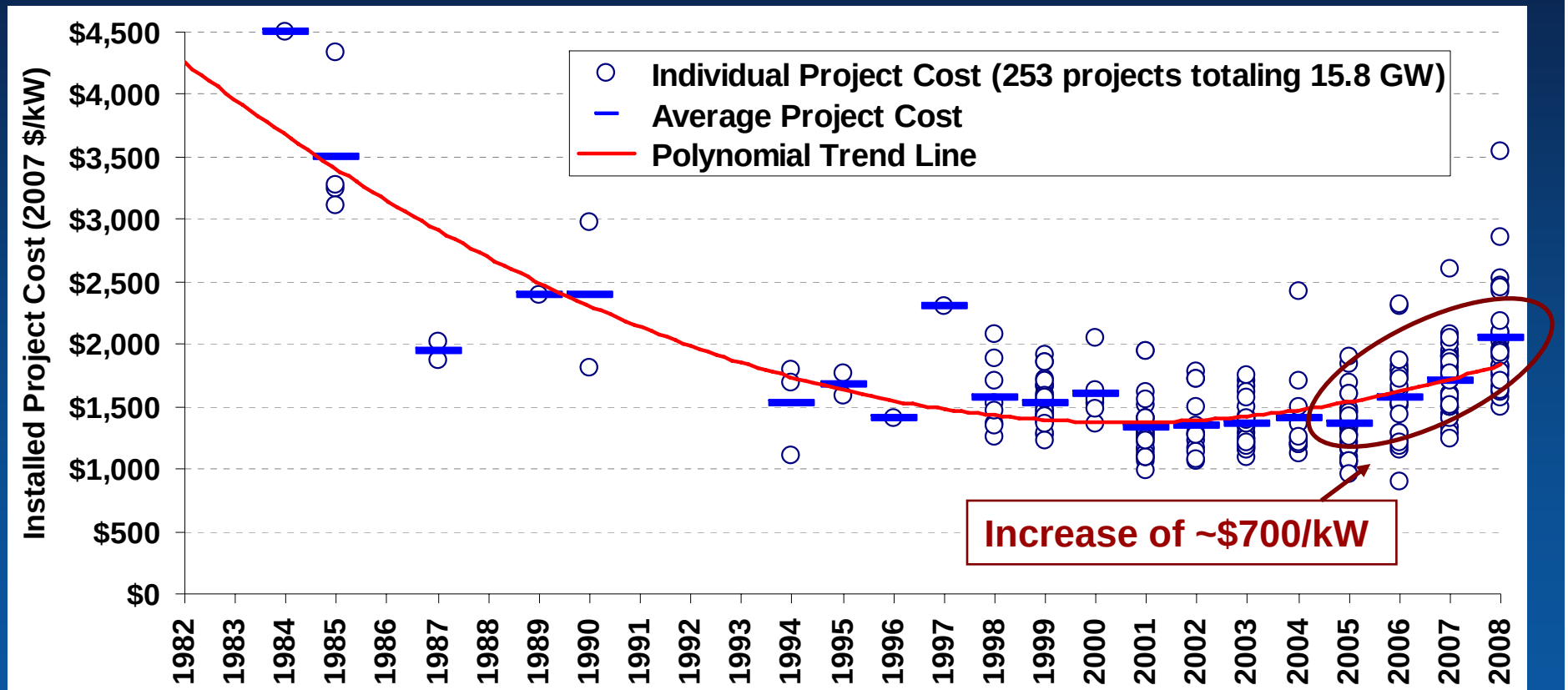
- 5,329 MW of wind added (*more than double* previous record)
- Roughly $9 billion in investment

U.S. Led the World in 2007 Wind Capacity Additions

Incremental Capacity (2007, MW)		Cumulative Capacity (end of 2007, MW)	
U.S.	**5,329**	Germany	22,277
China	3,287	**U.S.**	**16,904**
Spain	3,100	Spain	14,714
Germany	1,667	India	7,845
India	1,617	China	5,875
France	888	Denmark	3,088
Italy	603	Italy	2,721
Portugal	434	France	2,471
U.K.	427	U.K.	2,394
Canada	386	Portugal	2,150
Rest of World	2,138	*Rest of World*	13,591
TOTAL	**19,876**	**TOTAL**	**94,030**

Source: BTM Consult; AWEA project database for U.S. capacity.

Installed Project Costs Are On the Rise, After a Long Period of Decline



Source: Berkeley Lab database (some data points suppressed to protect confidentiality)

SEAAC Strategic Energy Analysis and Applications Center

NREL National Renewable Energy Laboratory

Drivers for Wind Power

- Declining Wind Costs
- Fuel Price Uncertainty
- Federal and State Policies
- Economic Development
- Public Support
- Green Power
- Energy Security
- Carbon Risk

SEAAC Strategic Energy Analysis and Applications Center

NREL National Renewable Energy Laboratory

Why Support Wind Energy Development?

- Clean energy production
  - Air quality benefits
  - Reduced greenhouse gas emissions
- Fixed, predictable costs
- Use of local or in-state resources
- Local economic benefits
- Reduced water consumption

Federal – Production Tax Credit (PTC) and REPI

- 2.0cents/kWh inflation adjusted for first 10 years of operation
- Expires Dec 31, 2008; congress has been debating an extension
- Renewable Energy Production Incentive (REPI) of approx 2cents/kWh for public utilities, subject to congressional appropriations

Federal – Modified Accelerated Cost-Recovery System (MACRS)

- What: Accelerated depreciation tax deduction
- Who: Commercial and industrial businesses
- Length: 5 year schedule (mid-yr start)

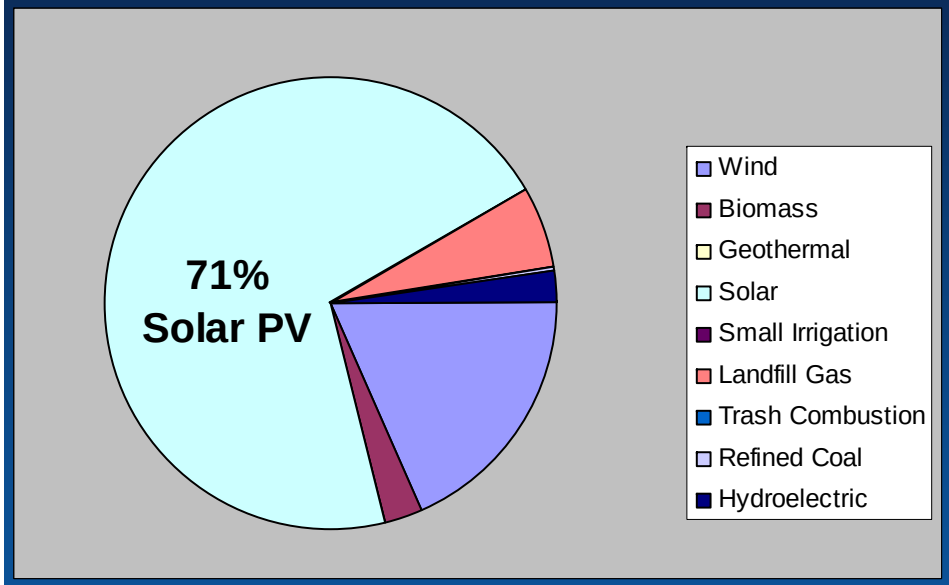
Percentage Depreciated by Year

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
20.00	32.00	19.20	11.52	11.52	5.76

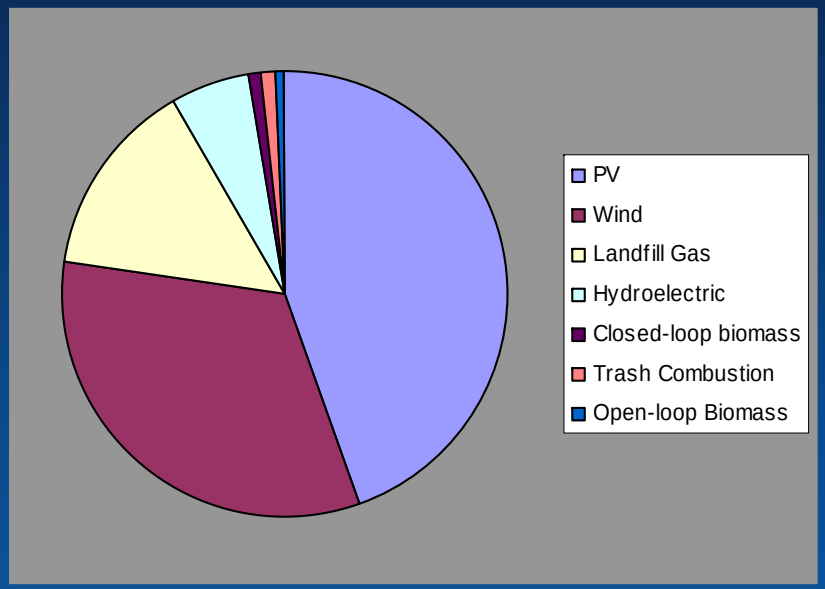
Clean Renewable Energy Bonds (CREBS)

- Public entities (co-ops, municipal utilities) apply to IRS for allocation
- If approved, issues bond, repays principal
- Bond investor receives tax credit in lieu of interest payment
- Two rounds to date – total $1.2 billion available

Wind Popular Among CREBs Projects



CREBs Round 1 (610 projects)



CREBs Round 2 (312 projects)

SEAAC Strategic Energy Analysis and Applications Center

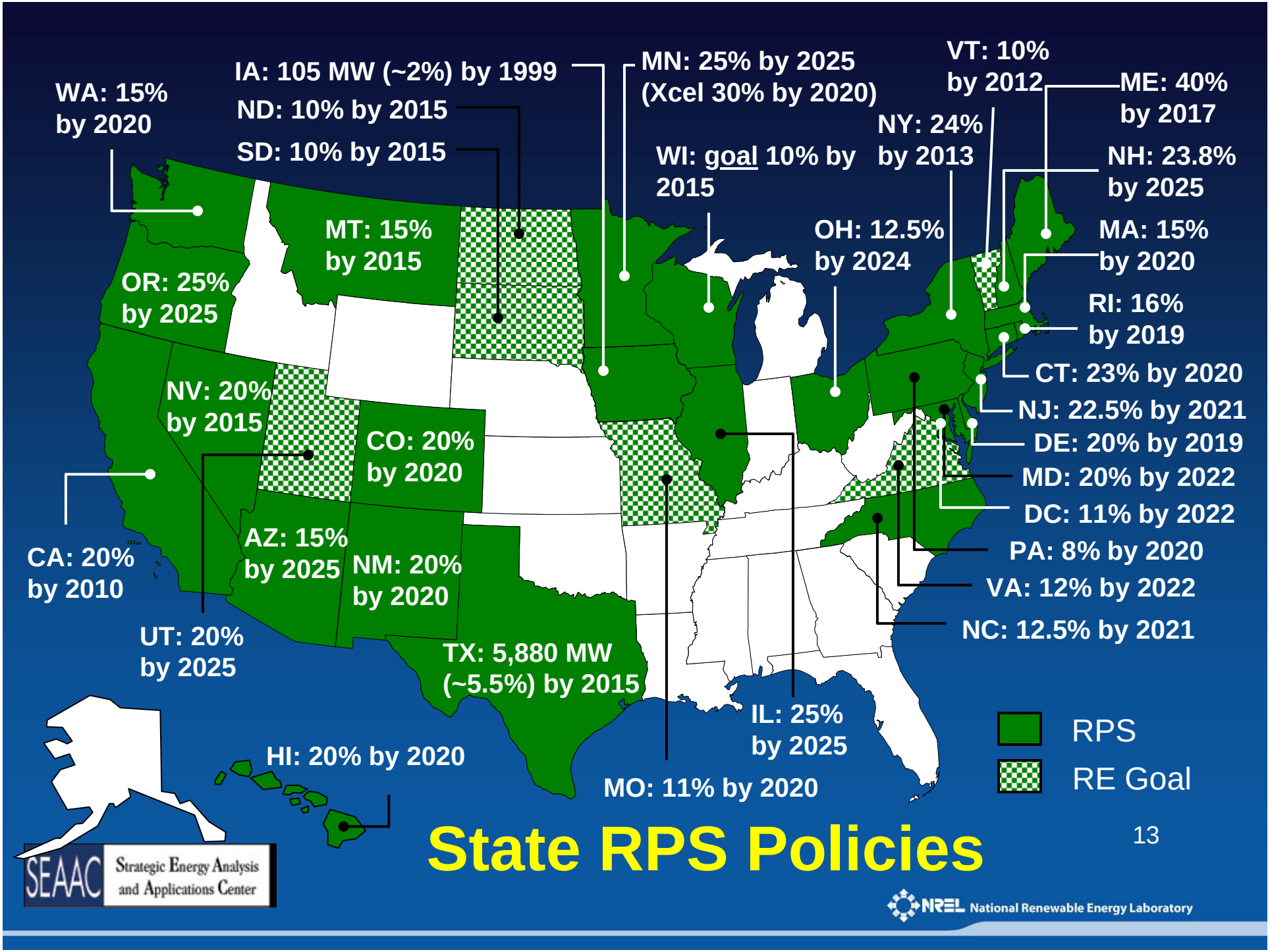
Source: Internal Revenue Service

NREL National Renewable Energy Laboratory

Variety of State Policies in Place

- Renewable portfolio standards (RPS)
- System Benefits Funds
  - Charge on electric bills
- Financial incentives
  - tax credits, production incentives, etc.
- Renewable energy purchases

Policies generally work together to drive market

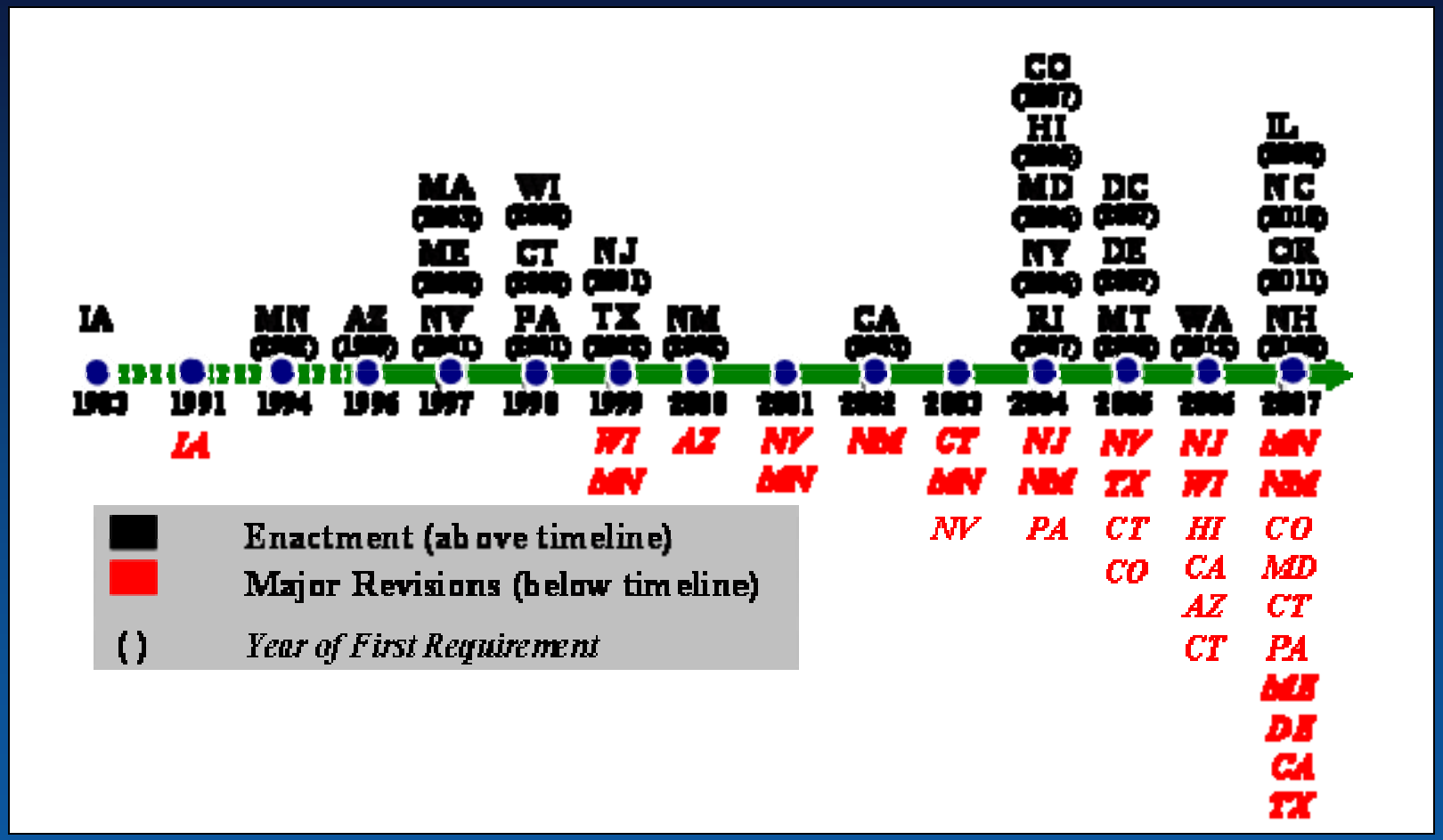


State RPS Policies

SEAAC Strategic Energy Analysis and Applications Center

NREL National Renewable Energy Laboratory

Increasing Interest in State RPS

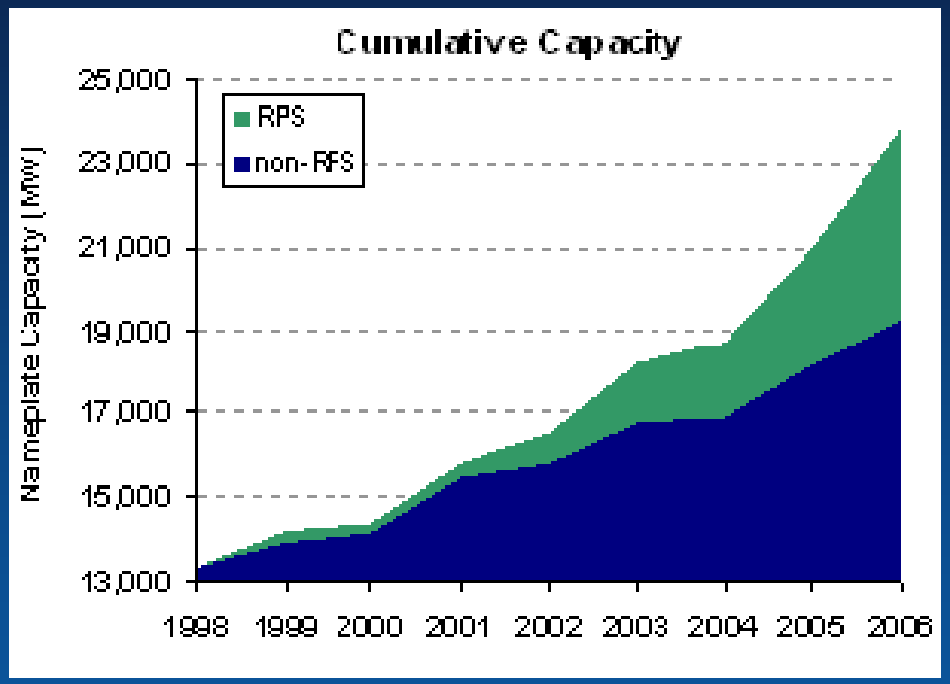


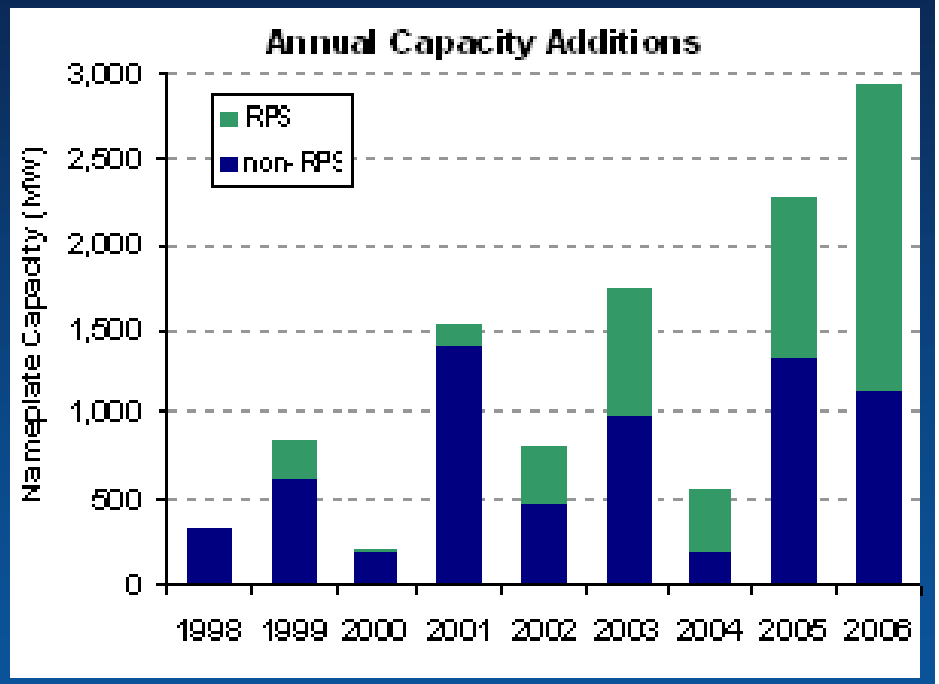
Source: LBNL

SEAAC Strategic Energy Analysis and Applications Center

NREL National Renewable Energy Laboratory

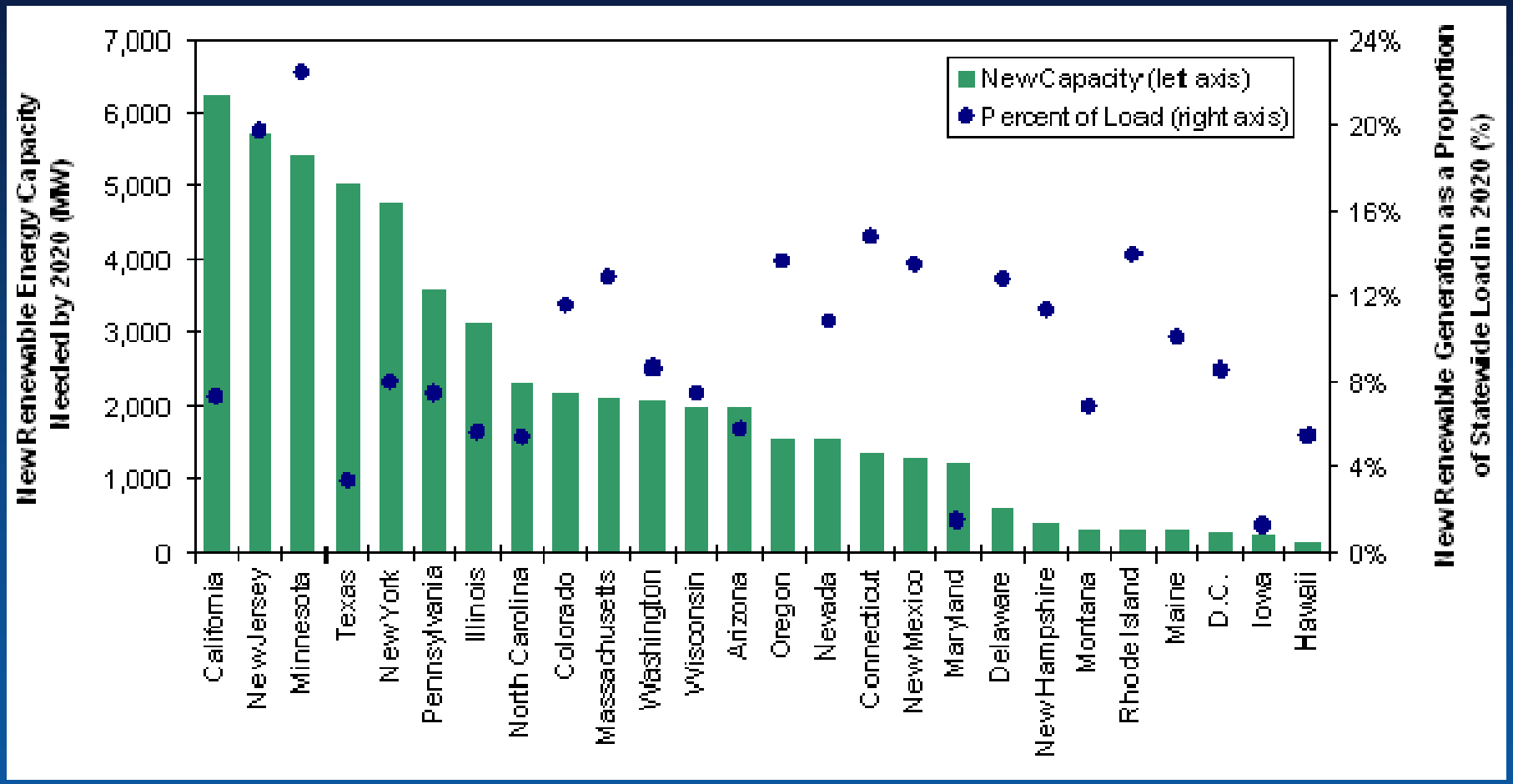
RPS Has Been Significant Driver of New Renewables





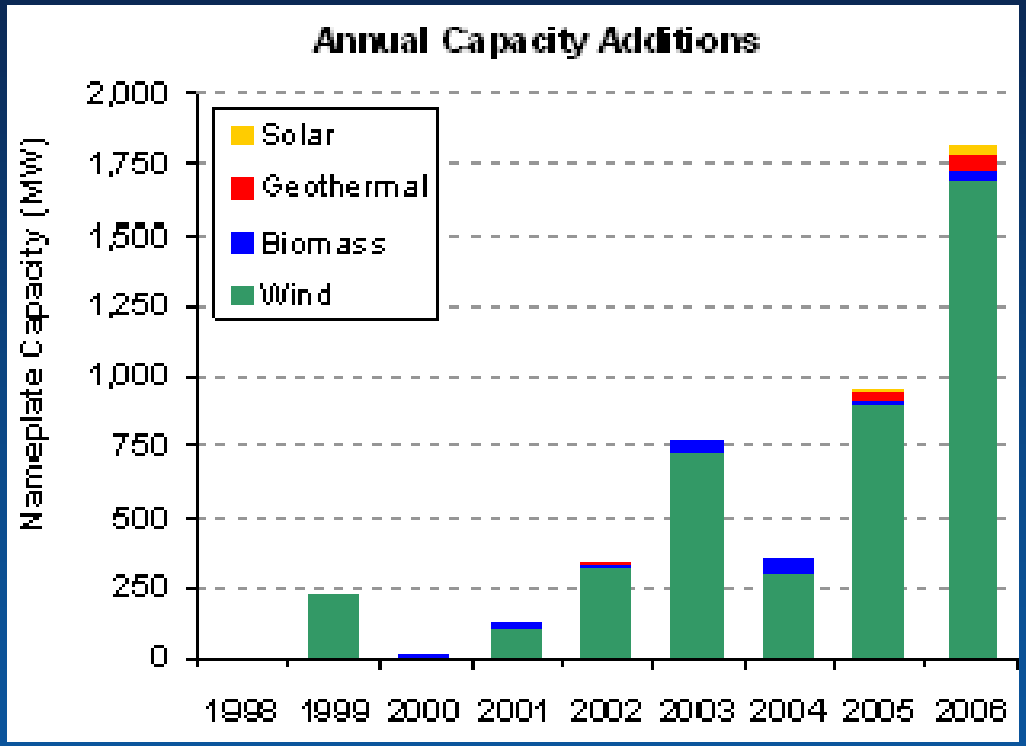
Source: LBNL

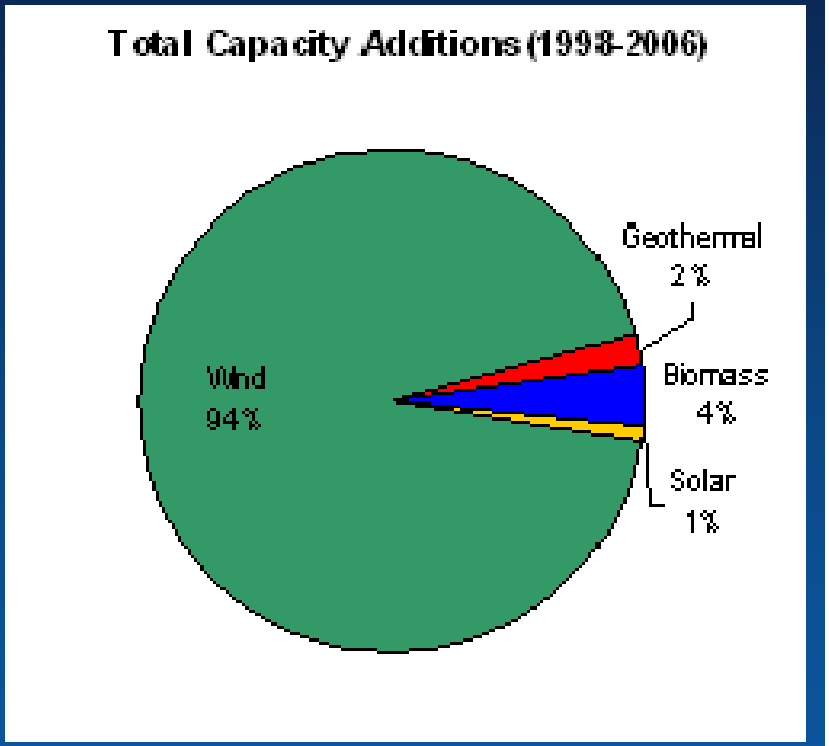
New Capacity Expected from State RPS



Source: LBNL

Wind Dominates Capacity Additions from RPS



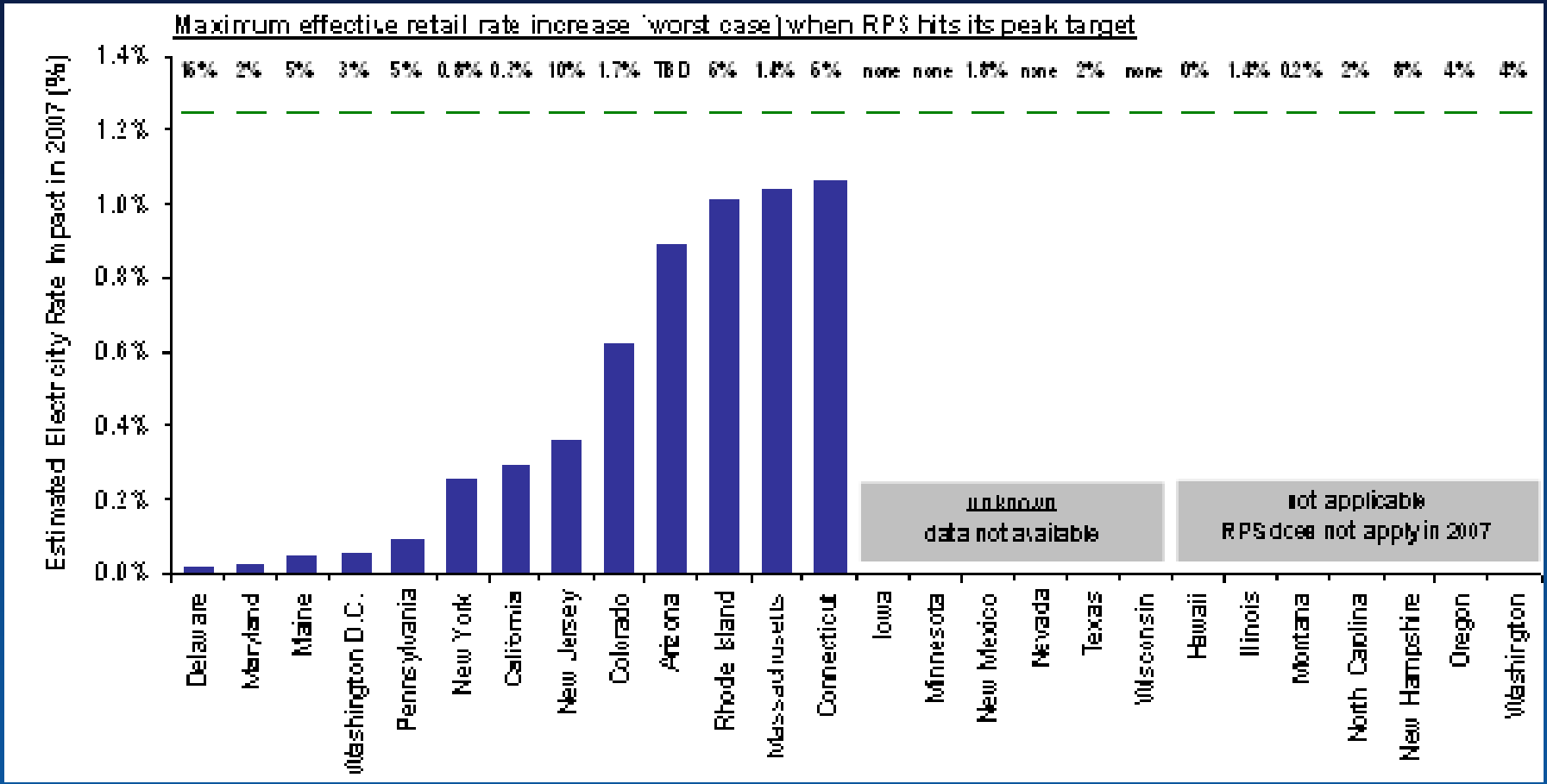


Source: LBNL

SEAC Strategic Energy Analysis and Applications Center

NREL National Renewable Energy Laboratory

Estimated Rate Impacts of RPS



Source: LBNL

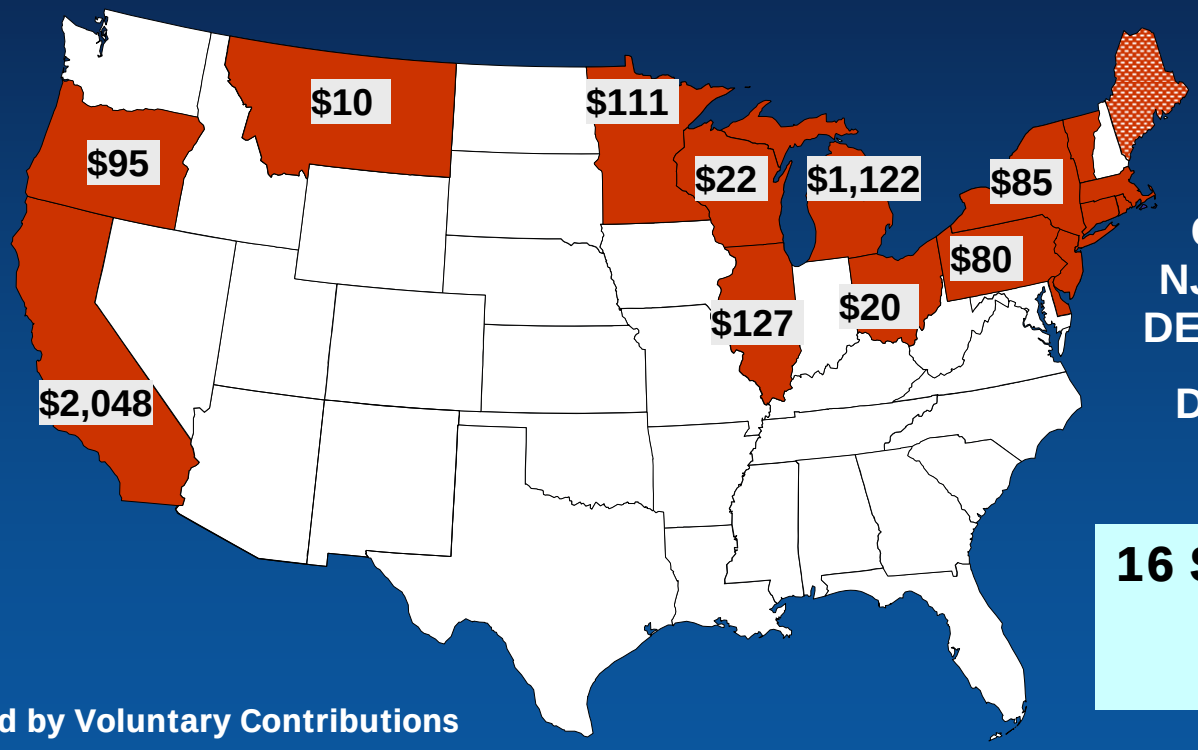
Maximum rate increase is about 1% or less for states where data are available

SEAC Strategic Energy Analysis and Applications Center

NREL National Renewable Energy Laboratory

State – System/Public Benefit Funds

Cumulative 1998 – 2017 (Million $)



VT: $36
MA: $383
RI: $10
CT: $338
NJ: $279
DE: $11

DC: $10.5

16 State Funds + DC
$4 B by 2017
(+ ME voluntary)

Funded by Voluntary Contributions

Source: DSIRE – updated July 2007

SEAAC Strategic Energy Analysis and Applications Center

NREL National Renewable Energy Laboratory

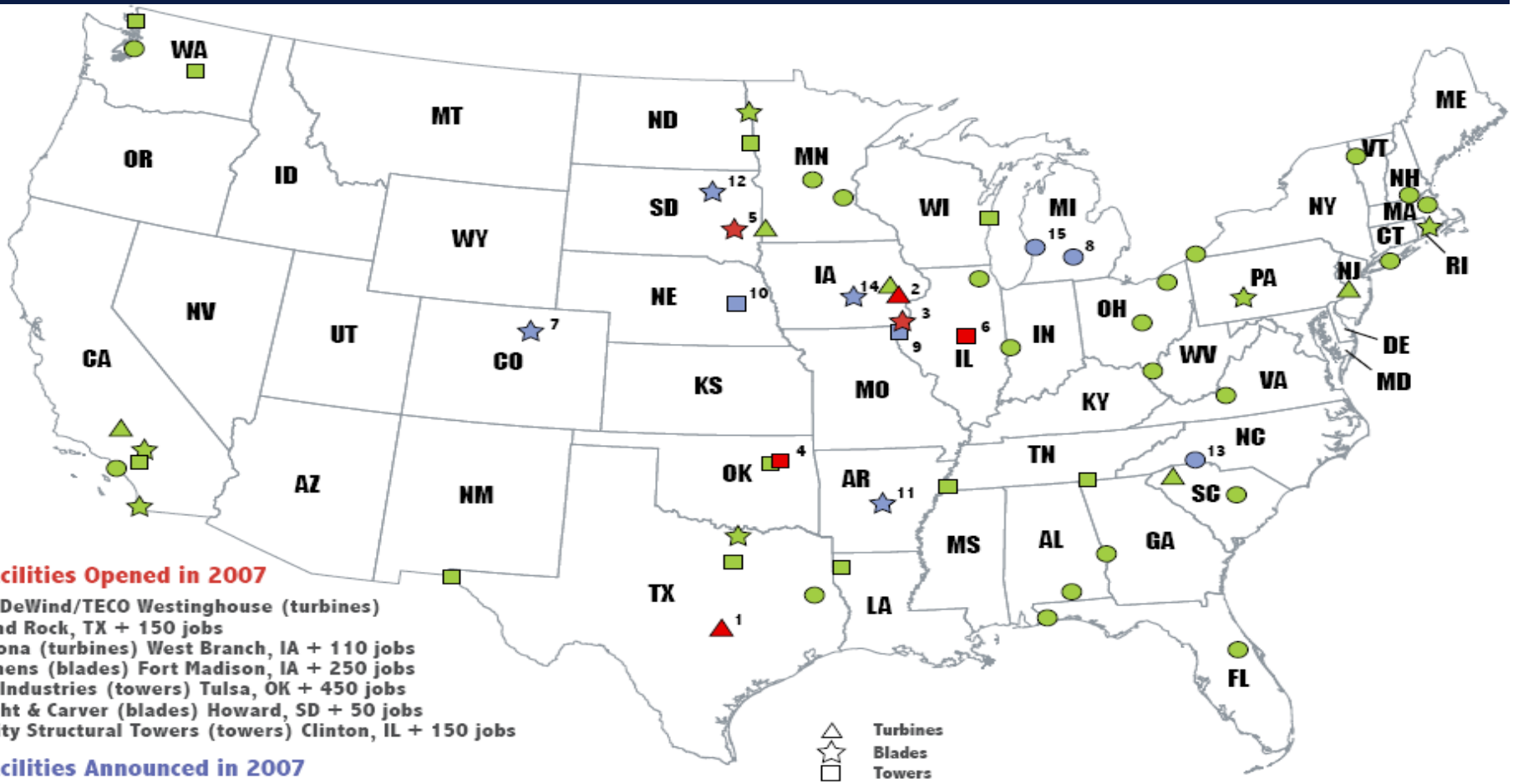
How are Renewable Energy Funds Used?

- Financial incentives (grants etc.)
- Price guarantees for electricity output in order to facilitate project financing.
- Development of in-state industry and delivery infrastructure
  - Resource assessments
  - Investments in start-ups
- Public education about renewables

State Financial Incentives for Wind

- Direct Incentives
  - Grants
  - Production Incentives
- Low-Interest Loans
- Corporate Tax Incentives
- Sales Tax Exemptions
- Property Tax Incentives
- Industry Recruitment Incentives

Soaring Demand Spurs Expansion of U.S. Wind Turbine Manufacturing



New Facilities Opened in 2007

1. CTC-DeWind/TECO Westinghouse (turbines) Round Rock, TX + 150 jobs
2. Acciona (turbines) West Branch, IA + 110 jobs
3. Siemens (blades) Fort Madison, IA + 250 jobs
4. DMI Industries (towers) Tulsa, OK + 450 jobs
5. Knight & Carver (blades) Howard, SD + 50 jobs
6. Trinity Structural Towers (towers) Clinton, IL + 150 jobs

New Facilities Announced in 2007

7. Vestas (blades) Windsor, CO + 650 jobs
8. Dowding Industries (turbine components) Eaton Rapids, MI + 200 jobs
9. Hendricks Industries (towers) Keokuk, IA + 350 jobs
10. Katana Summit (towers) Columbus, NE + 120 jobs
11. LM Glasfiber (blades) Little Rock, AR + 1,000 jobs
12. Molded Fiberglass (blades) Aberdeen, SD + 750 jobs
13. PPG Industries (fiberglass) Shelby, NC + not available
14. TPI Composites (blades) Newton, IA + 500 jobs
15. Genzink Steel (nacelles) Holland, MI + 10 jobs

Note: Map is not intended to be exhaustive

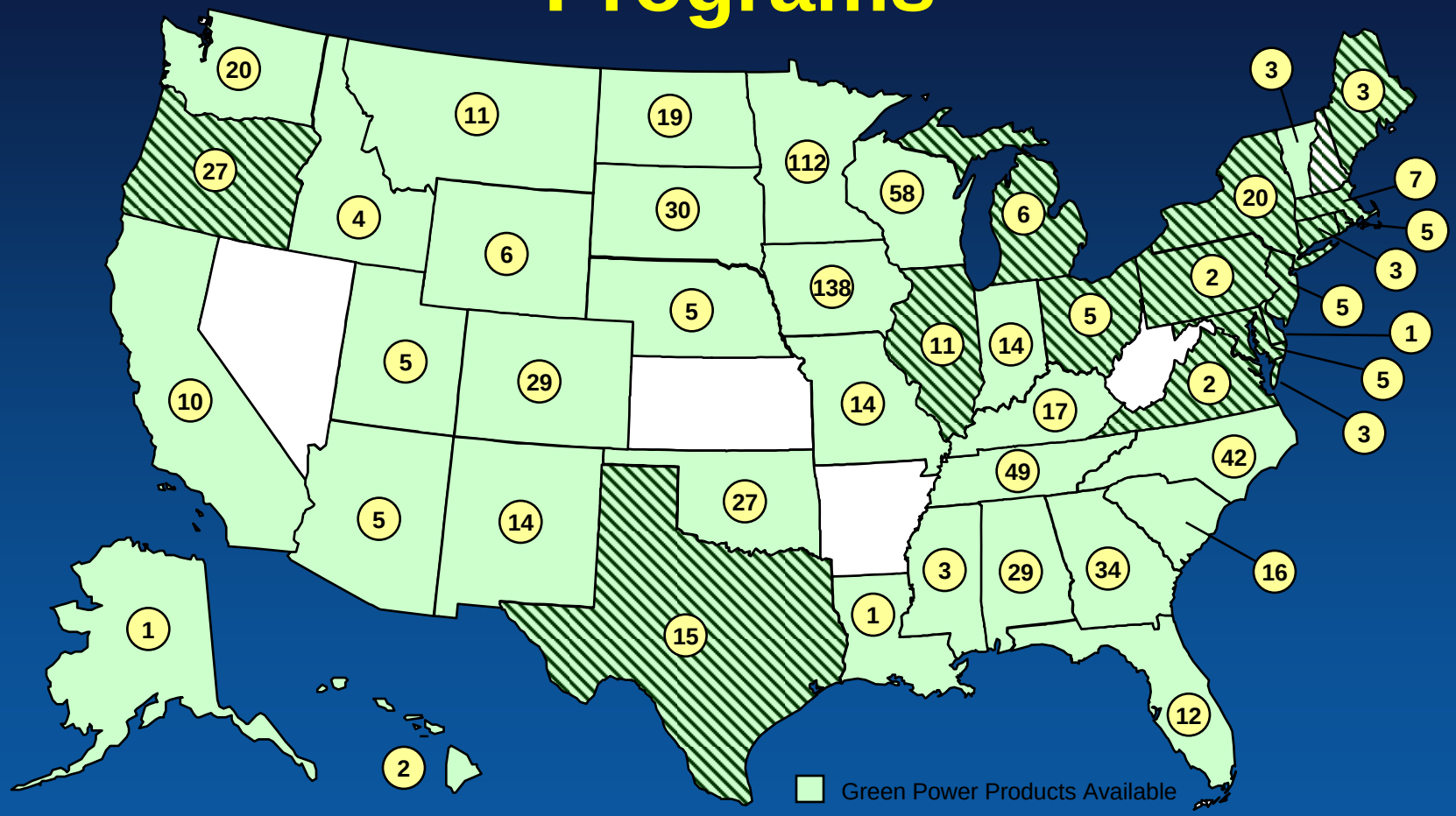
Figure includes wind turbine and component manufacturing facilities, as well as other supply chain facilities, and excludes corporate headquarters and service-oriented facilities. The facilities highlighted here are not intended to be exhaustive. Those facilities designated as "turbines" may include turbine assembly as well as component manufacture including, in some cases, towers and blades.

This map was created by The National Renewable Energy Laboratory for the U.S. Department of Energy April 16, 2008

Green Power Requirements

- Most utility green pricing programs are voluntary
- Some states require utilities to provide customers with green power options
  - (ex. IA, MN, MT, NM, OR, and WA)
- Some states have green power purchasing targets for state government ("lead by example")
  - Ex. Pennsylvania – 50% goal
- Counties and municipalities are also setting purchase goals.

States with Green Power Programs



Green Power Products Available

Restructured Electricity Market

No Green Power Activity

# Indicates Number of Green Power Products Offered by Utilities and Companies

SEAAC Strategic Energy Analysis and Applications Center

Source: National Renewable Energy Laboratory (October 2007)

NREL National Renewable Energy Laboratory

DSIRE: DSIRE Home - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address http://www.dsireusa.org/

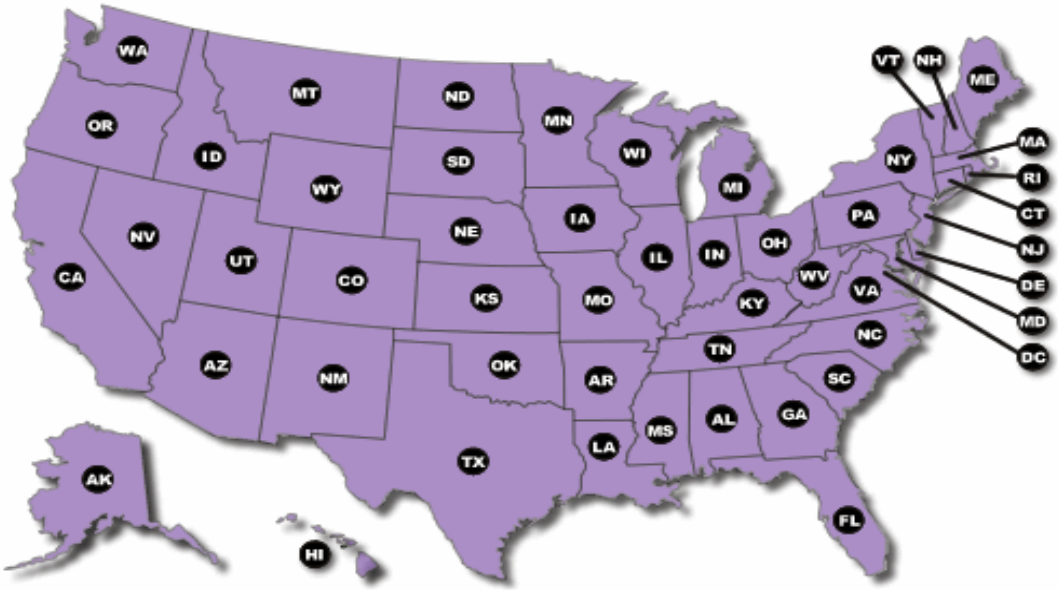
NC Solar Center | IREC | Contacts | About Us | IES

DSIRE
Database of State Incentives for Renewable Energy

- FAQs
- Summary Maps
- Summary Tables
- Search By
- Glossary
- Other Resources
- Library
- Schools Going Solar
- New / Updated Incentives

The Database of State Incentives for Renewable Energy (DSIRE) is a comprehensive source of information on state, local, utility, and selected federal incentives that promote renewable energy. To access information, use the menu to the left or click on the maps below.

Federal Incentives



T US Territory Incentives

Last Updated: 06/24/04

FAQs | Summary Maps | Summary Tables | Search By | Glossary | Other Resources

Internet