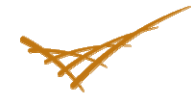


Current U.S. New and Renewable Energy Utilization

Cary Bloyd
EGNRET-36
Washington D.C., USA
February 28-March 2, 2011



Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle Since 1965

Presentation Overview

- ▶ Review of current and projected U.S. energy supply/demand
- ▶ U.S. Renewable Energy Consumption
- ▶ State renewable energy targets
- ▶ Private sector renewable energy activities



Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle Since 1965

U.S. DOE Energy Information Administration provides monthly energy consumption

- Monthly Energy Review (MER) - the latest energy statistics all in one place
- January 2011 Monthly Energy Review
Release Date: January 31, 2011
Next Update: Last Week of February 2011
- <http://www.eia.doe.gov/emeu/mer/renew.html>



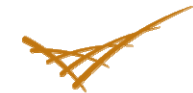
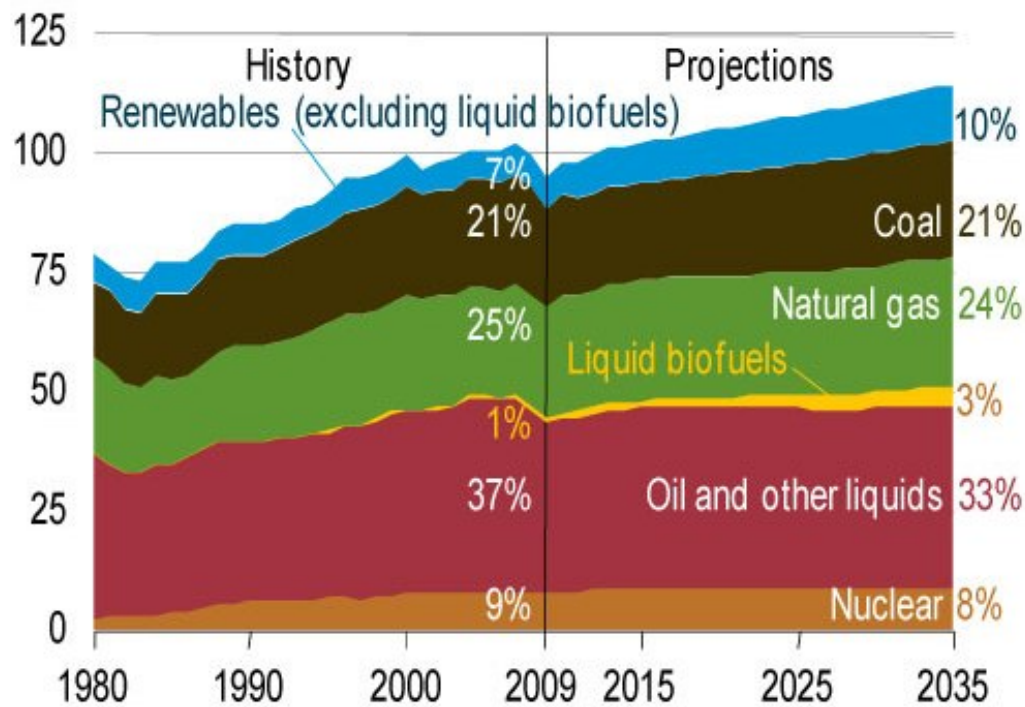
U.S. Energy Consumption by fuel 1980-2035

http://www.eia.doe.gov/forecasts/aeo/early_fuel.cfm

AEO2011 Early Release Overview

December 16, 2010

Primary energy consumption (quadrillion Btu per year)



Pacific Northwest
NATIONAL LABORATORY

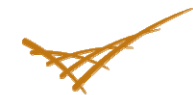
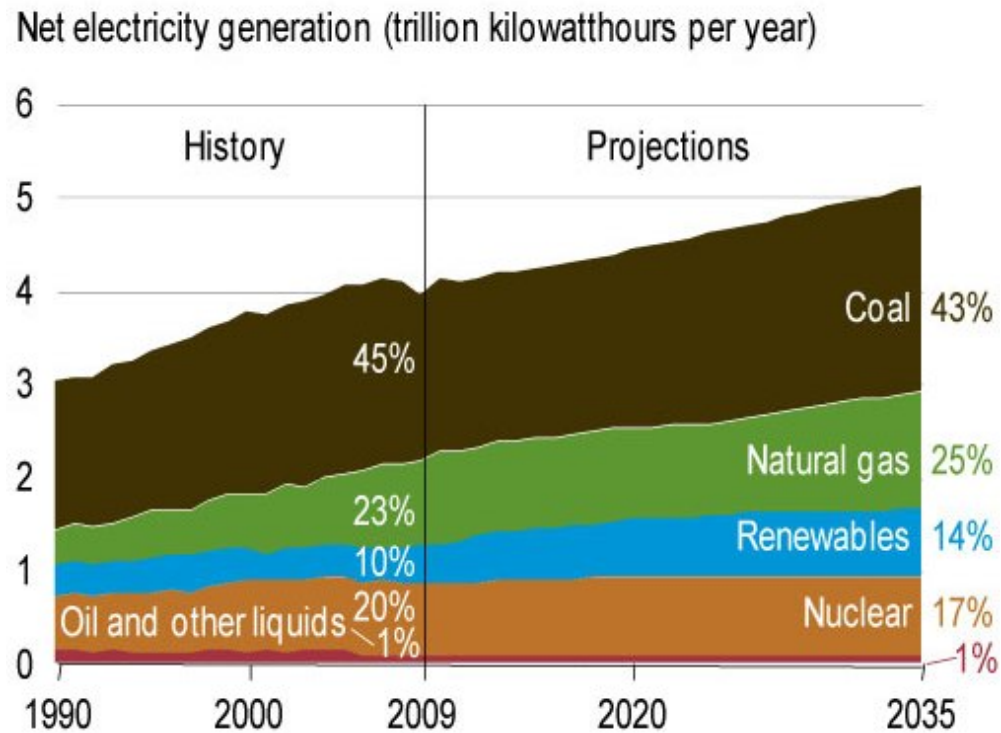
Proudly Operated by Battelle Since 1965

U.S. projected fuel mix for electricity generation gradually shifts to lower carbon options

http://www.eia.doe.gov/forecasts/aeo/executive_summary.cfm

AEO2011 Early Release Overview

December 16, 2010



Pacific Northwest
NATIONAL LABORATORY

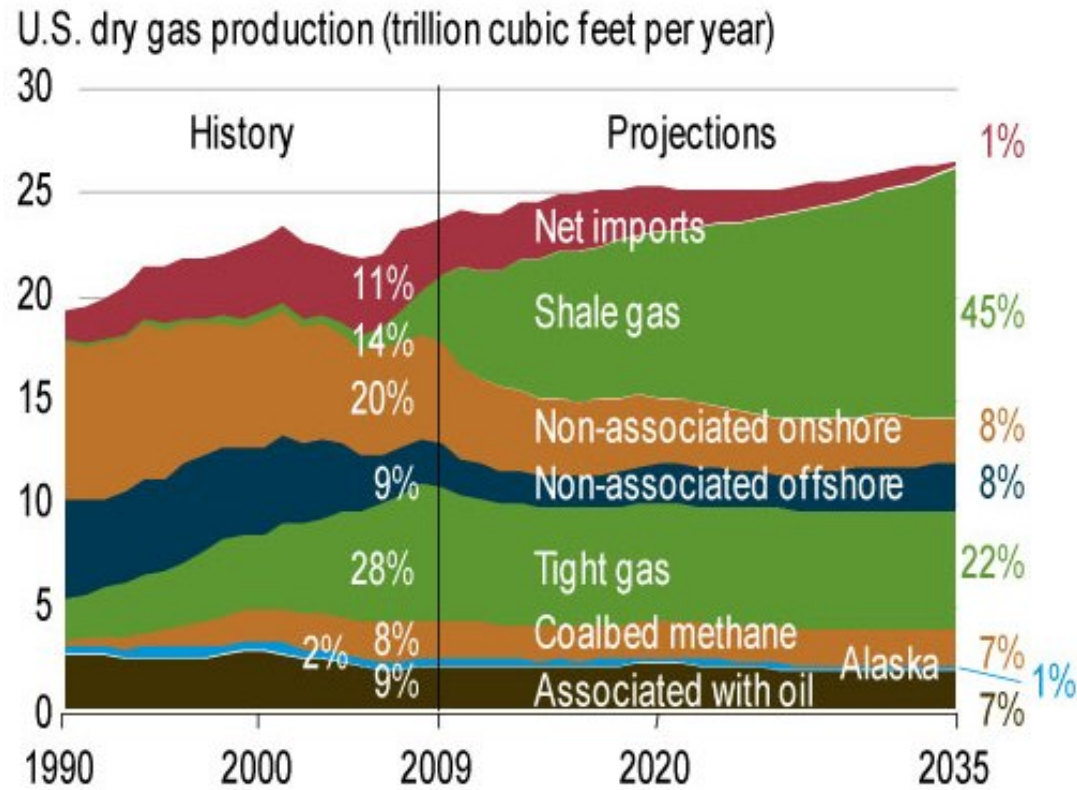
Proudly Operated by Battelle Since 1965

Shale gas offsets declines in other U.S. supply

http://www.eia.doe.gov/forecasts/aeo/executive_summary.cfm

AEO2011 Early Release Overview

December 16, 2010



Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle Since 1965

U.S. Energy Flow, 2009

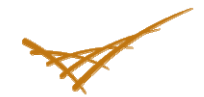
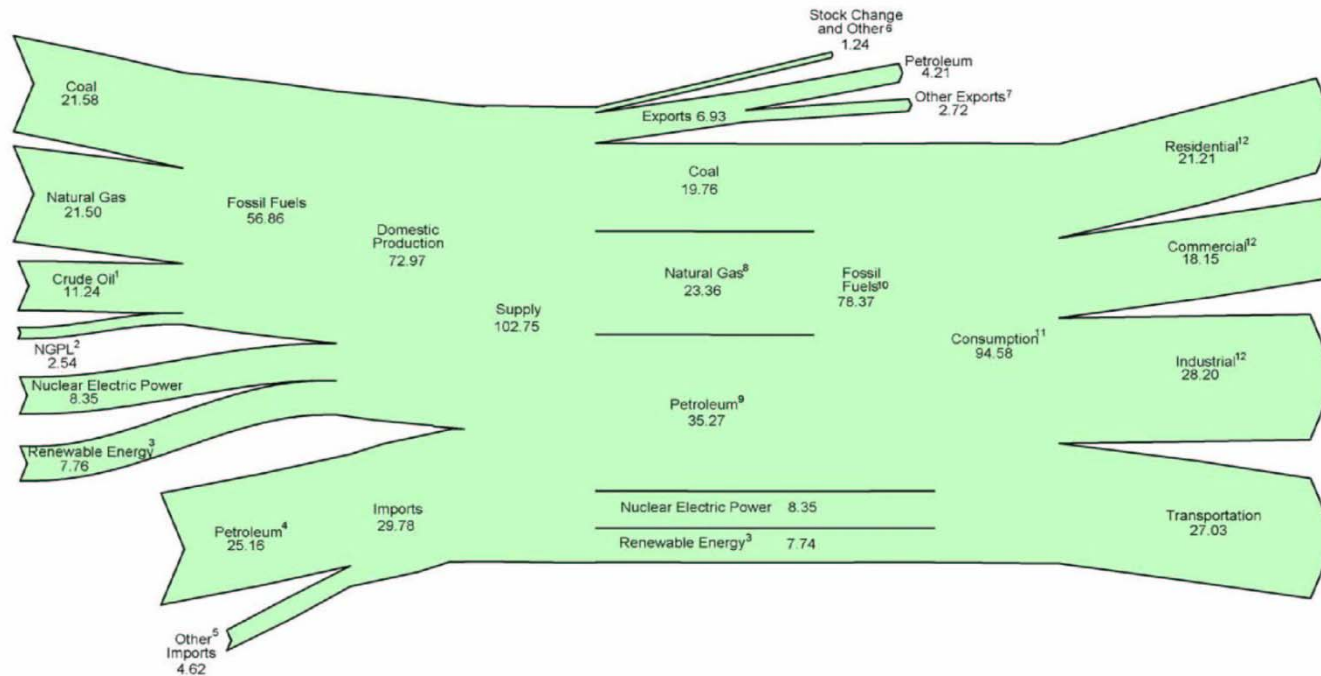
(Quadrillion Btu)

<http://www.eia.gov/aer/diagram1.html>

Annual Energy Review 2009

Release Date: August 19, 2010

Next Update: July 2011

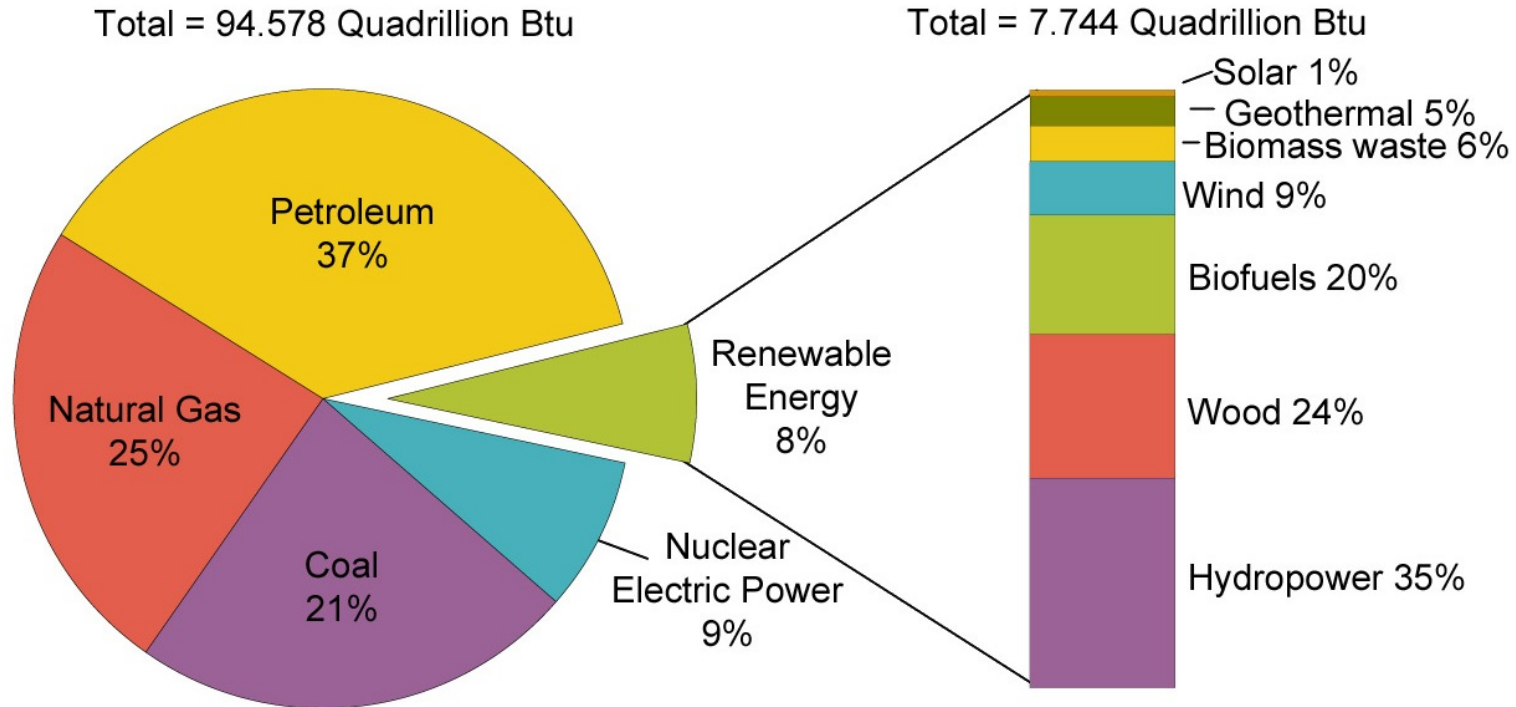


Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle Since 1965

U.S. Renewable Energy Consumption in 2009

http://www.eia.gov/energy_in_brief/renewable_energy.cfm



Note: Sum of components may not equal 100% due to independent rounding.

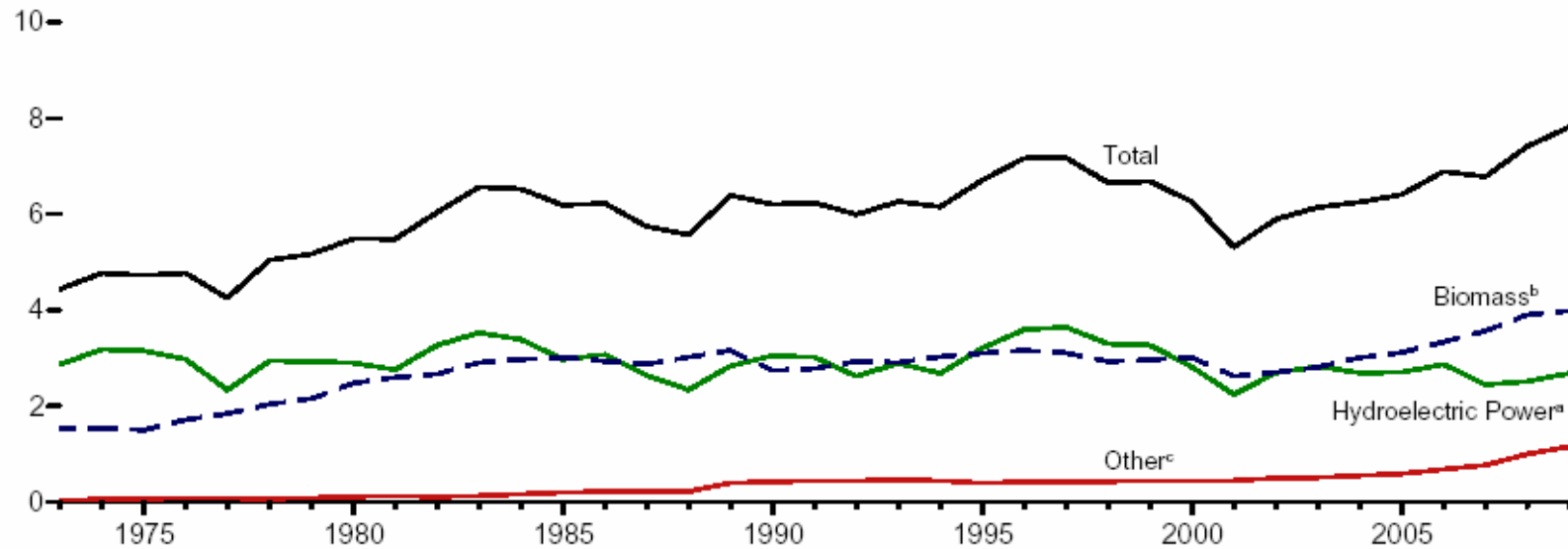
Source: U.S. Energy Information Administration, *Annual Energy Review 2009*, Table 1.3, Primary Energy Consumption by Energy Source, 1949-2009 (August 2010).

Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle Since 1965

Renewable Energy Consumption (Quadrillion Btu)

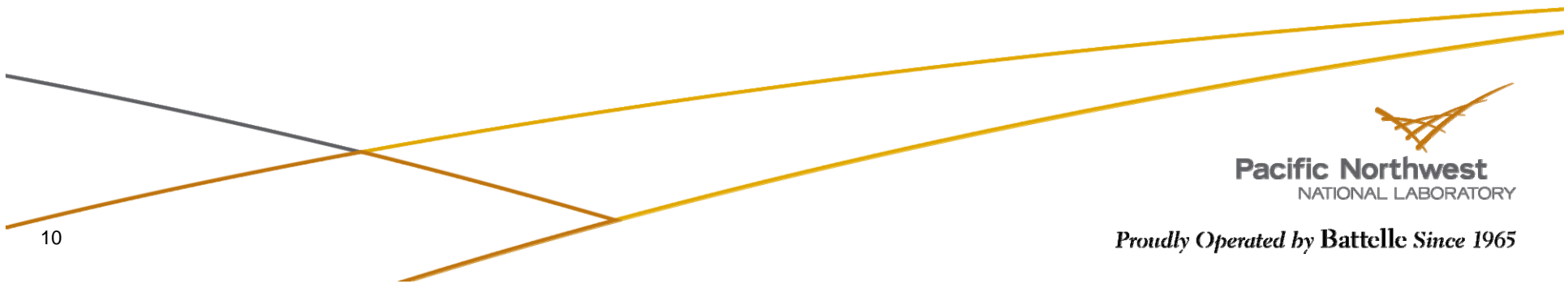
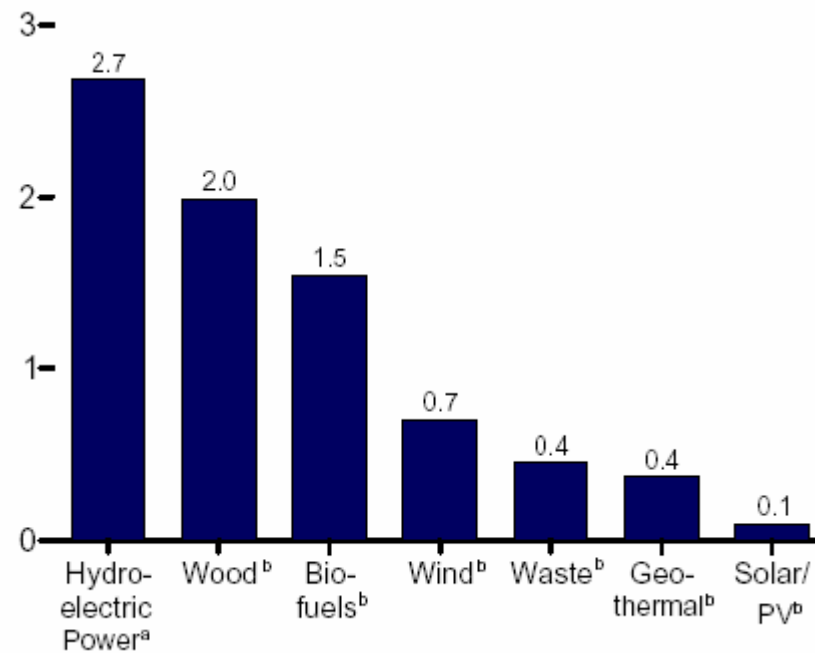
Total and Major Sources, 1973-2009



Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle Since 1965

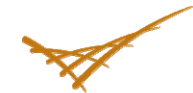
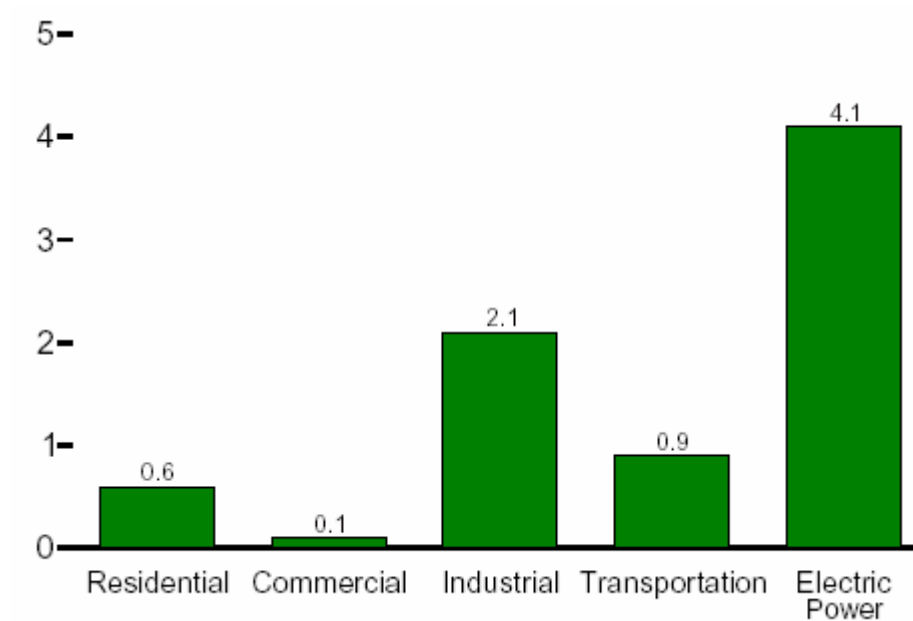
Renewable Energy by Source, 2009 (Quadrillion Btu)



Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle Since 1965

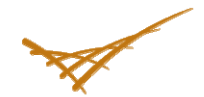
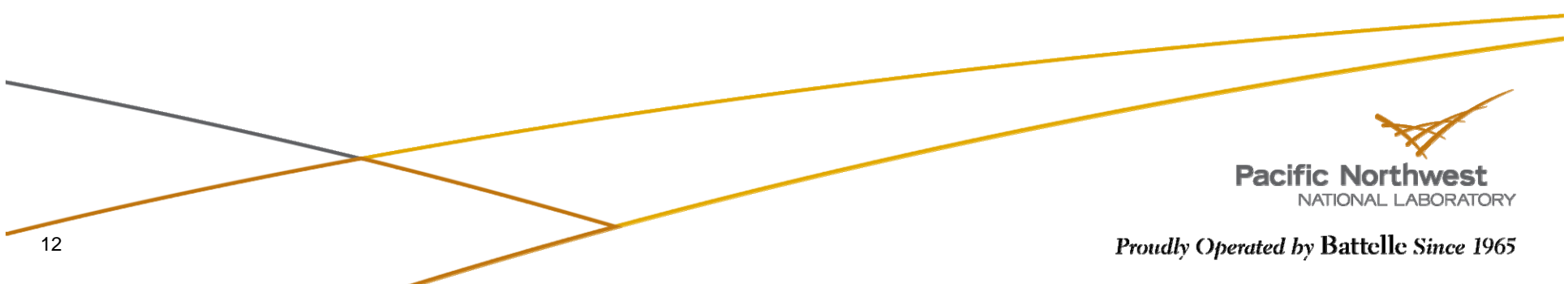
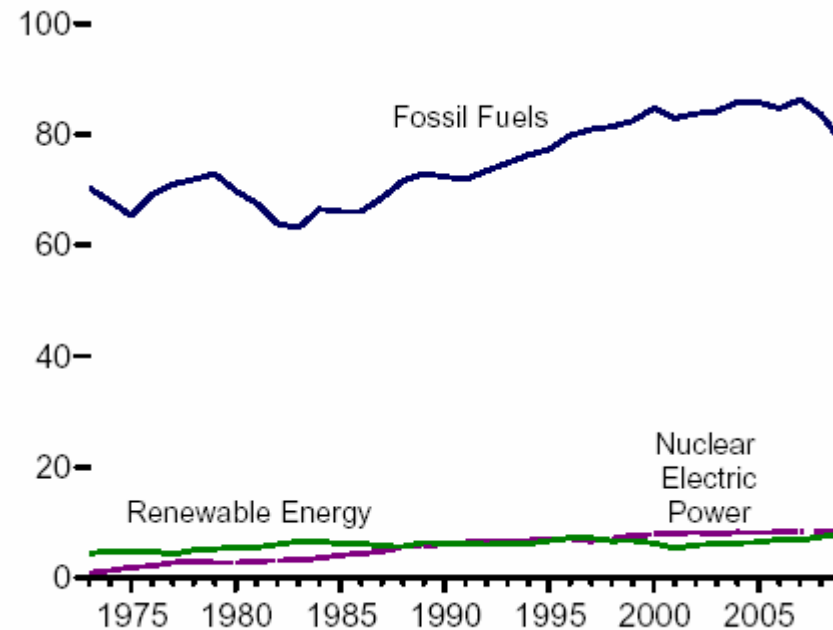
Renewable Energy by Sector, 2009 (Quadrillion Btu)



Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle Since 1965

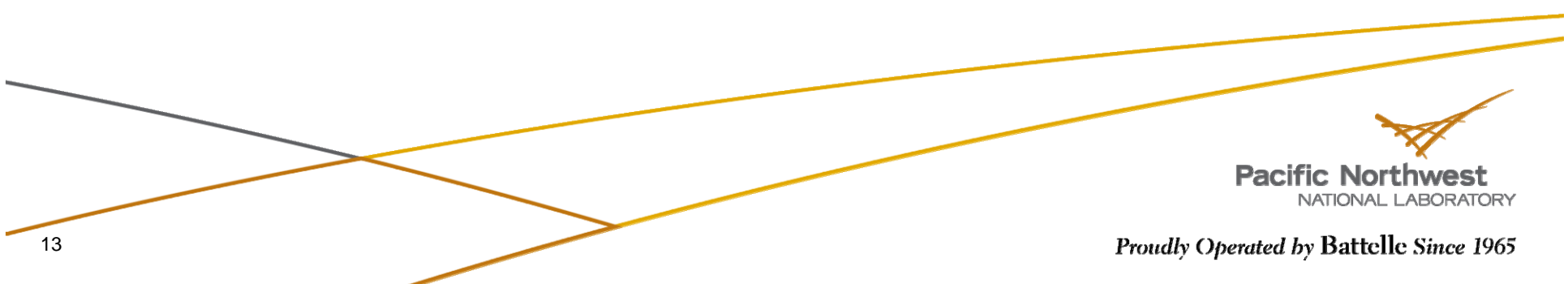
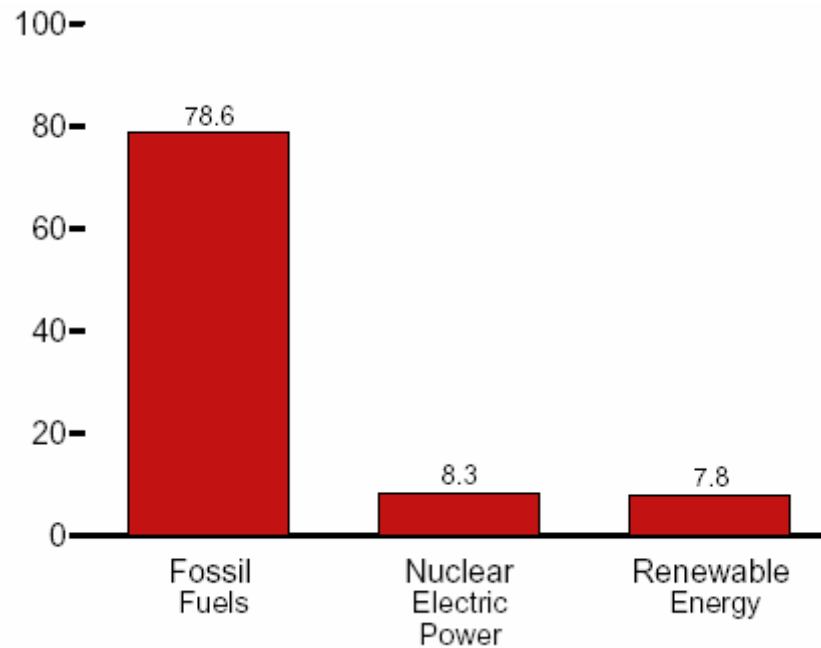
Renewable energy compared with other resources (Quadrillion Btu)



Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle Since 1965

Renewable energy compared with other resources 2009 (Quadrillion Btu)

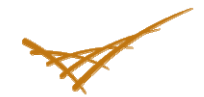
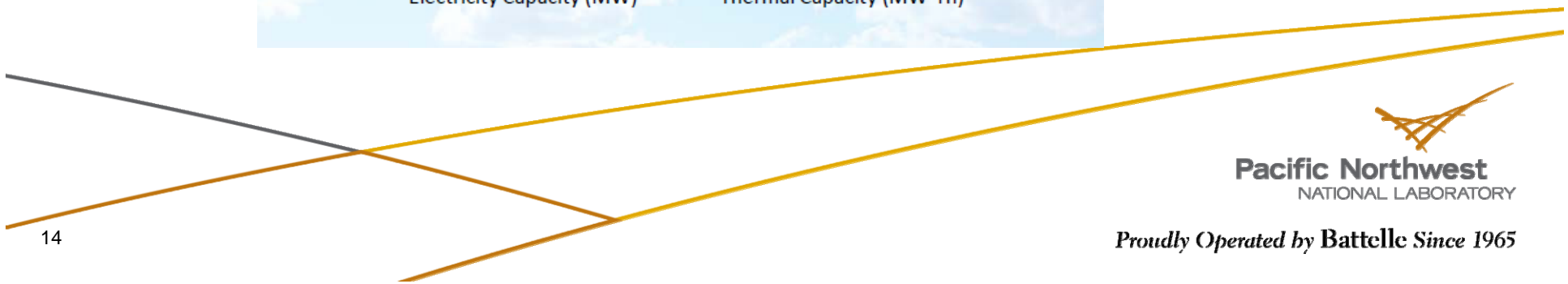
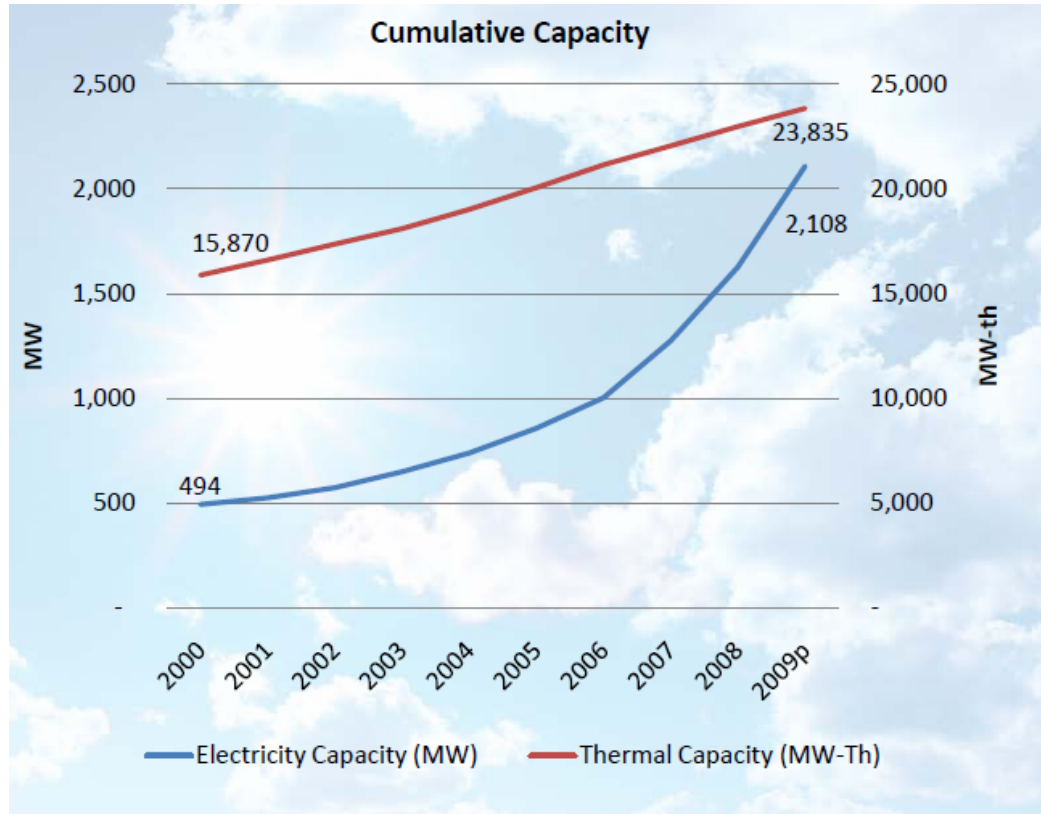


Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle Since 1965

U.S. Solar capacity has continued to grow

Solar Energy Industries Association
2009 Solar Industry Year in Review
<http://www.seia.org/>

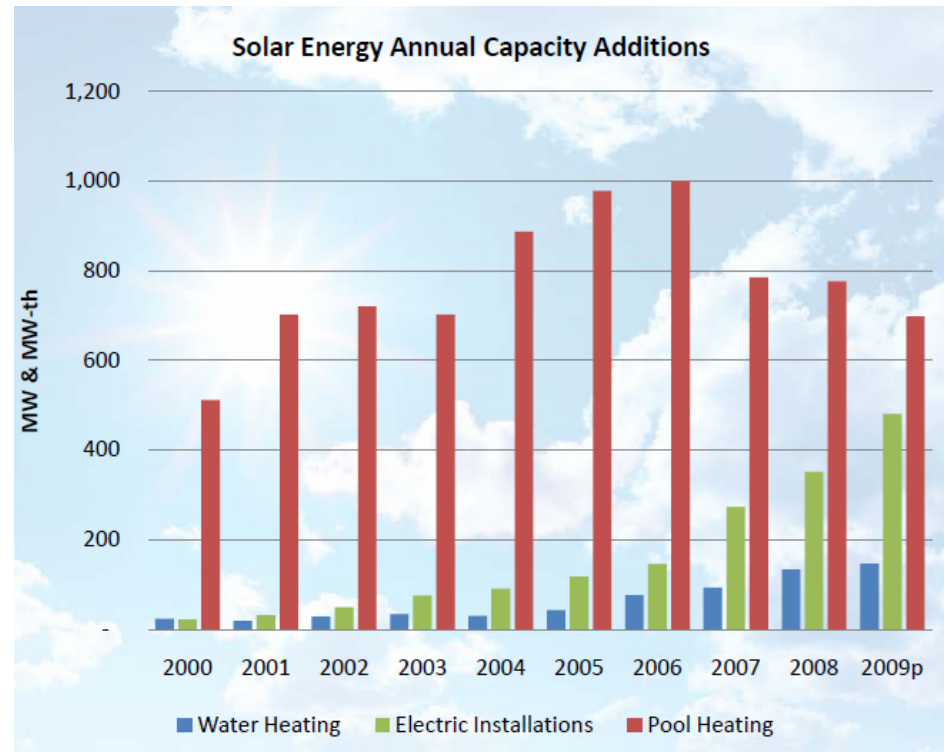


Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle Since 1965

U.S. Solar capacity growth by type

Solar Energy Industries Association
2009 Solar Industry Year in Review
<http://www.seia.org/>



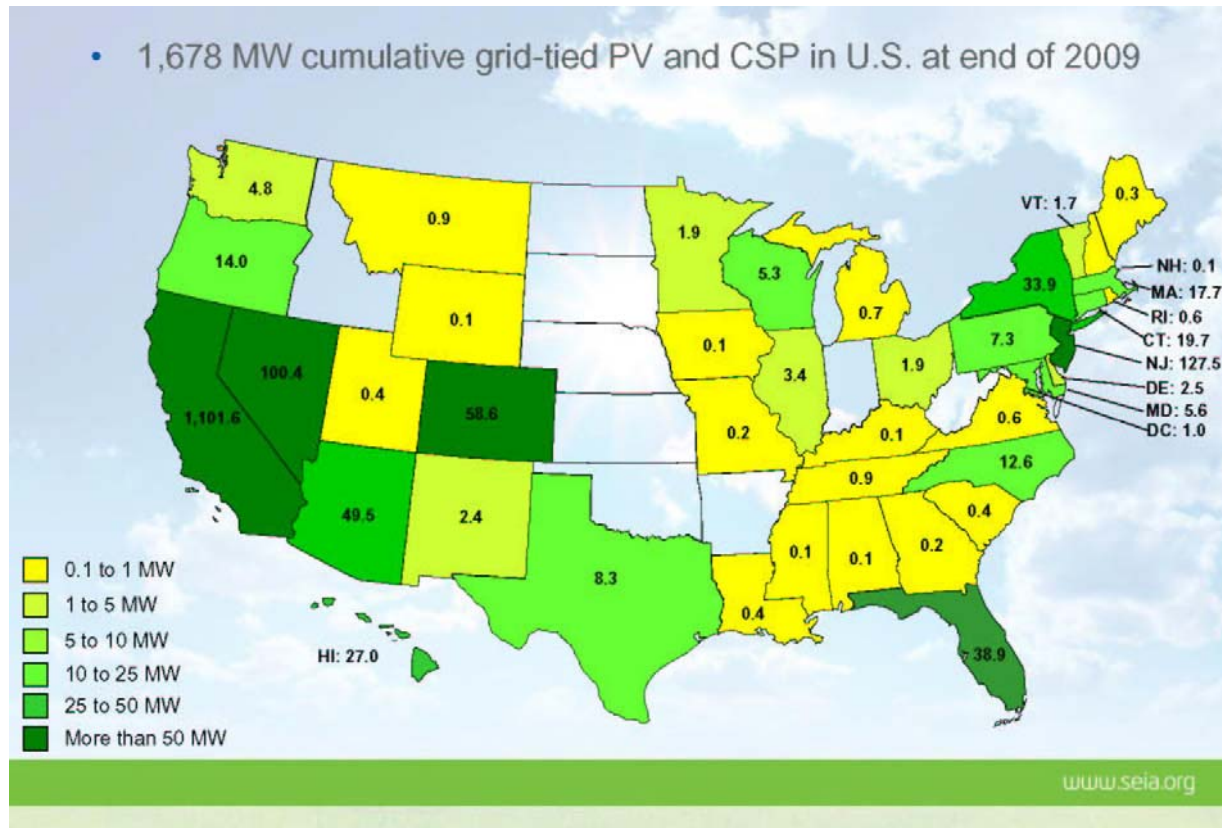
California has led grid-connected PV capacity

Solar Energy Industries Association
2009 Solar Industry Year in Review
<http://www.seia.org/>

2009 New Capacity (MW)		2009 Cumulative Capacity (MW)	
1	California	220	1,102
2	New Jersey	57	128
3	Florida	36	100
4	Arizona	23	59
5	Colorado	23	50
6	Hawaii	14	39
7	New York	12	34
8	Massachusetts	10	27
9	Connecticut	9	20
10	North Carolina	8	18
	Other	29	78
	Total	441	1,653

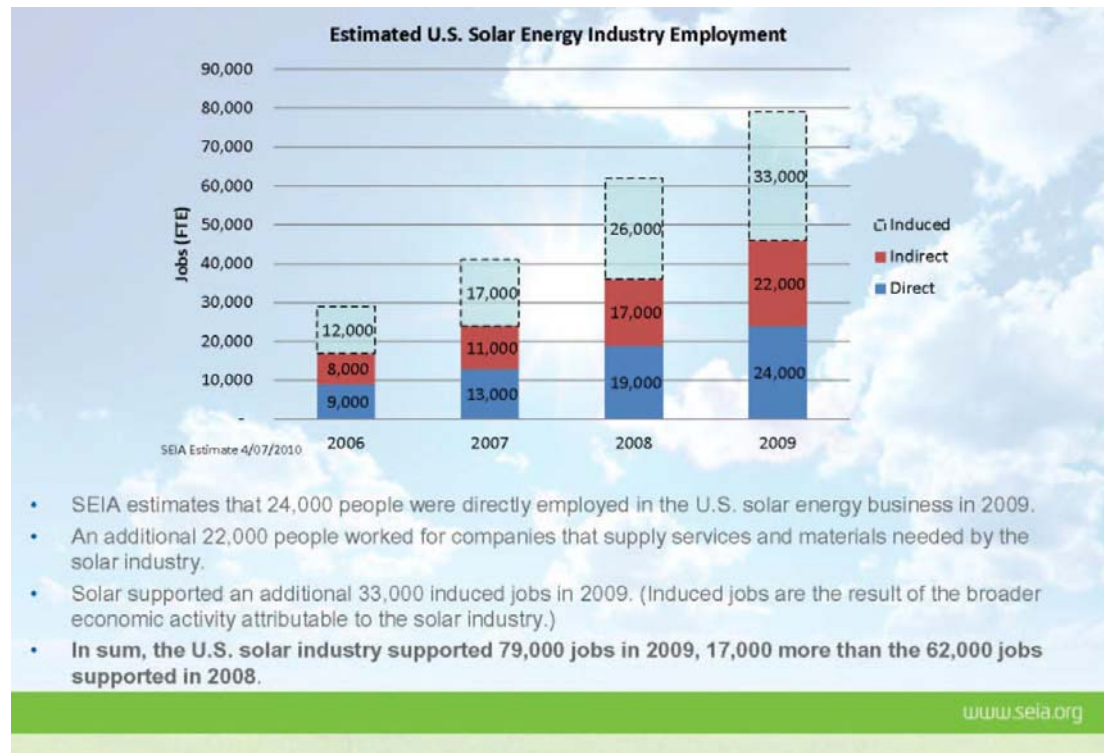
U.S. Cumulative grid-tied solar electric capacity, 2009

Solar Energy Industries Association
 2009 Solar Industry Year in Review, supplemental slides
<http://www.seia.org/>



The U.S. solar industry employed 46,000 workers in 2009

Solar Energy Industries Association
2009 Solar Industry Year in Review, supplemental slides
<http://www.seia.org/>

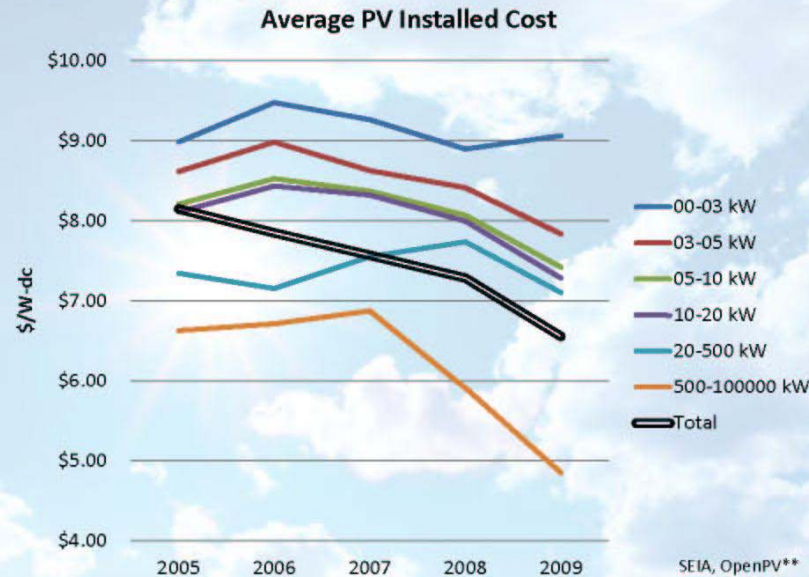


Average PV cost has continued to decline

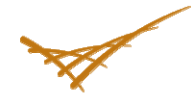
Solar Energy Industries Association
2009 Solar Industry Year in Review, supplemental slides
<http://www.seia.org/>

- In 2009, PV Module prices fell 40 percent.
- Average module price per watt in mid-2008 was \$3.50-4.00.*
- Average module price per watt at the end of 2009 was \$1.85-2.25.*
- This is beginning to help bring down the installed cost.

* Paula Mints, Navigant Consulting, Inc.
** Capacity-Weighted Average. Data from OpenPV.nrel.gov downloaded 3/30/10.



www.seia.org

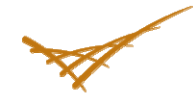


Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle Since 1965

The Solar Decathlon will bring 20 university teams together in Washington D.C. to design, build and operate solar-powered houses (fall 2011)

<http://www.solardecathlon.gov/index.html>



Pacific Northwest
NATIONAL LABORATORY

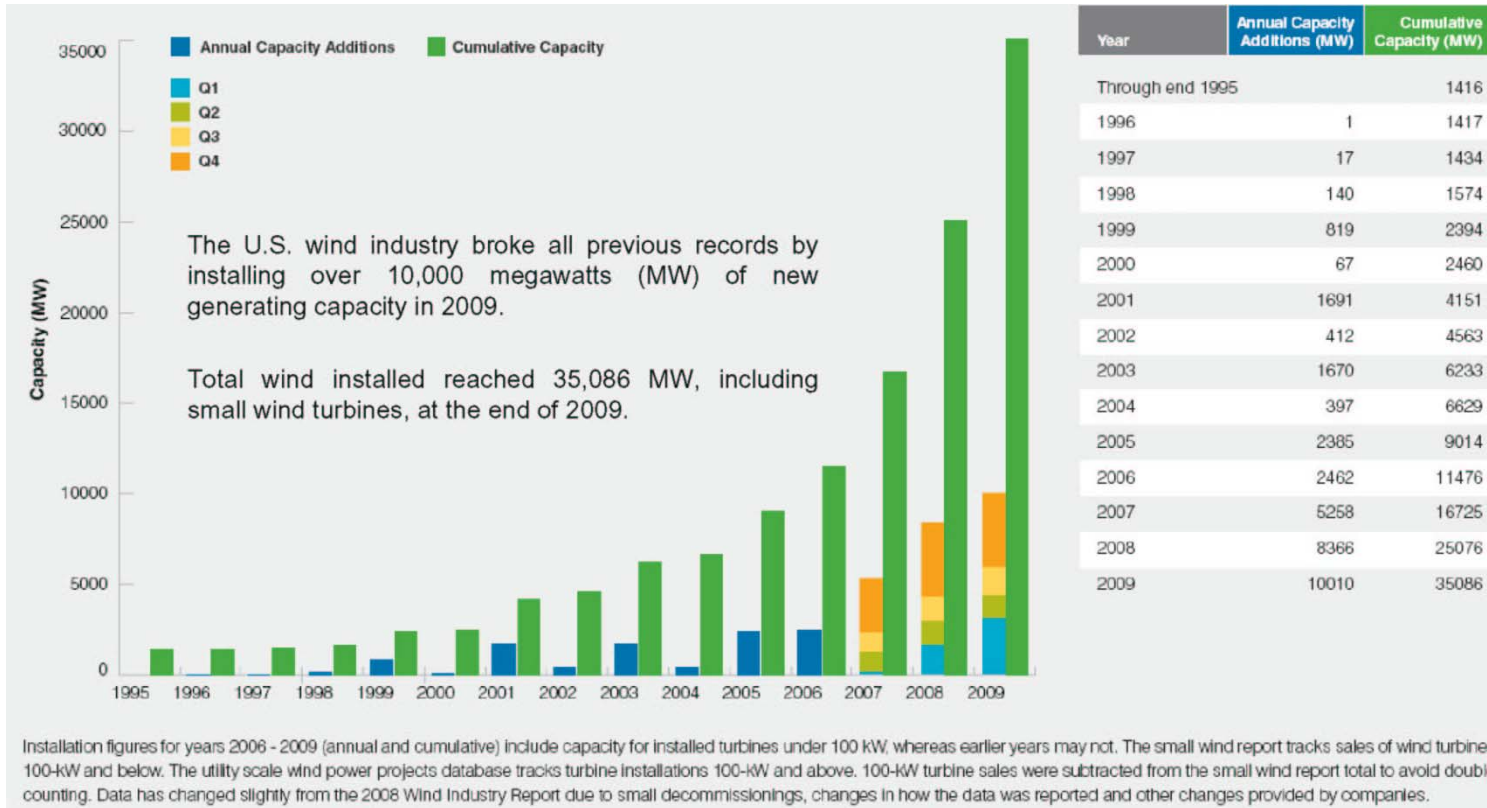
Proudly Operated by Battelle Since 1965

U.S. Wind capacity continues to grow

American Wind Association

AWEA Annual Wind Industry Report, Year Ending 2009

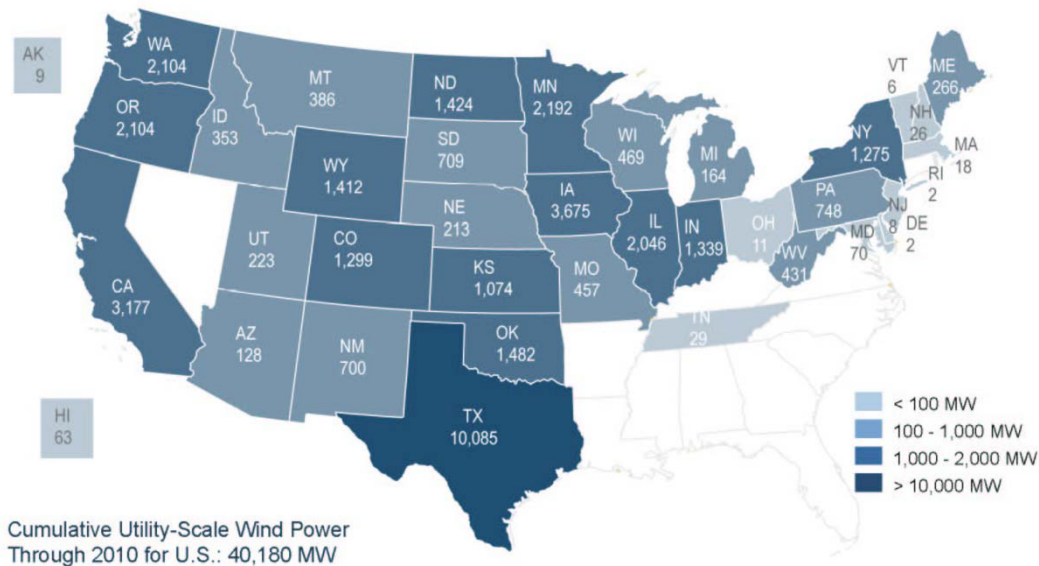
http://www.awea.org/la_pubs_reports.cfm



U.S. Wind capacity by state (2010)

American Wind Association
 AWEA Fourth Quarter 2010 Market Report
http://www.awea.org/la_pubs_reports.cfm

Installed Capacity by State



American Wind Energy Association * 4th Quarter 2010 Market Report 


Pacific Northwest
 NATIONAL LABORATORY

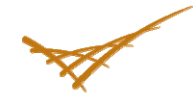
Proudly Operated by Battelle Since 1965

Five states produce more than 5% of their electricity from wind

American Wind Association
Industry ranking factsheet
http://www.awea.org/la_pubs_factsheets.cfm

State Percentage of Electricity from Wind

Iowa	14.2%
Minnesota	9.4%
North Dakota	8.1%
Oregon	6.4%
Colorado	5.8%

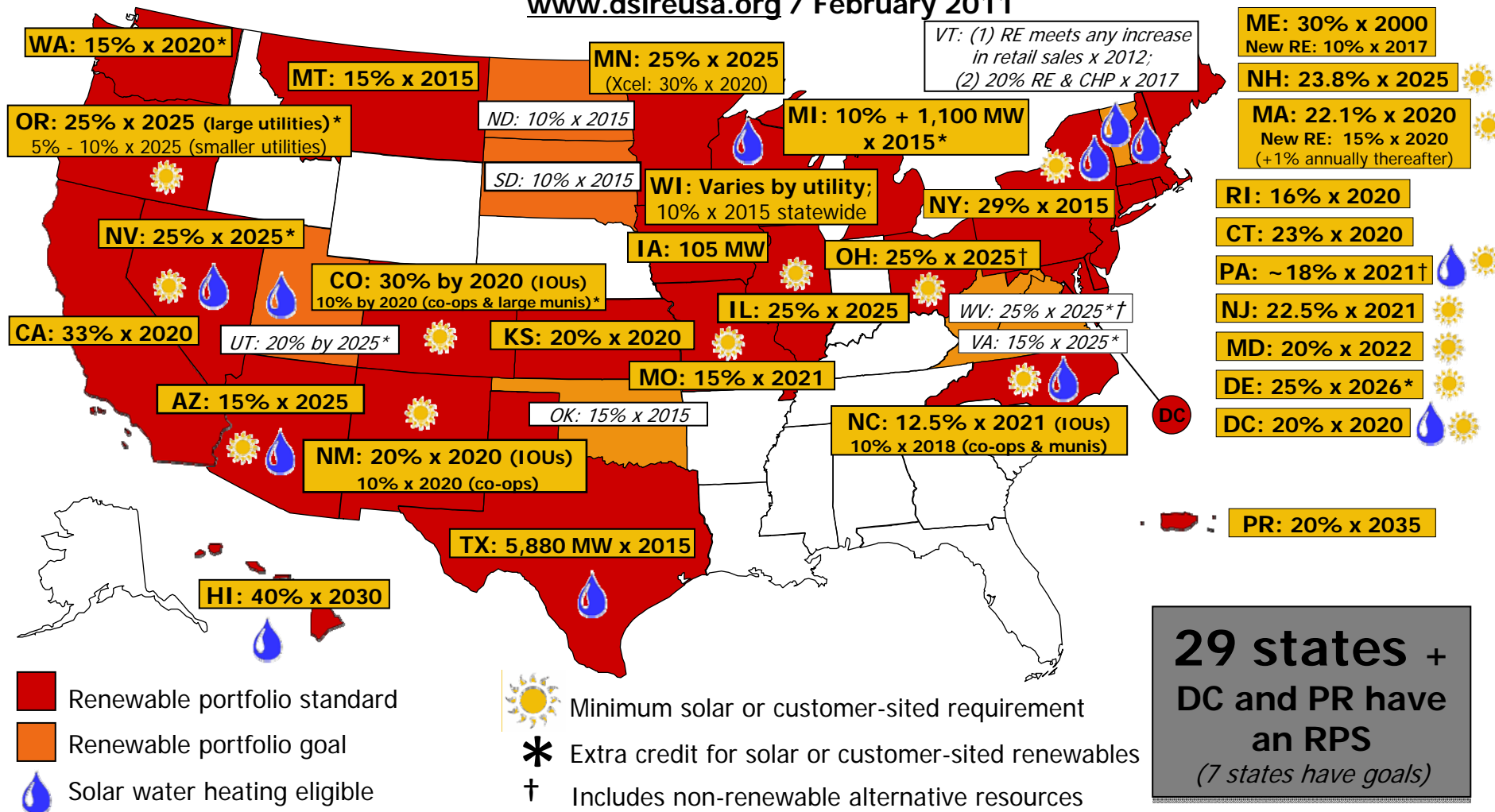


Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle Since 1965

RPS Policies

www.dsireusa.org / February 2011



29 states + DC and PR have an RPS
(7 states have goals)

The private sector is taking a leading Role in the utilization of PV in the U.S.

- ▶ Wal-Mart has set a goal of 100% renewable energy
 - Largest US commercial energy user
 - Proposed activities would place approximately 100 MW of PV on 3,900 stores across five states
 - Stated goal is to reduce GHG emissions by 20% in 8 years and design a store that will uses 30% less energy
 - Supplies 20 to 30 percent of store's total energy use
- ▶ In 2007 Google installed a 1.6 MW PV system with full cost payback expected by 2013 (supplies 30% of peak energy)
 - They signed a 114 MW, 20-year wind purchase power agreement in July 2010
 - They made a decision to become carbon neutral starting in 2007
 - Google Green—Building a clean energy future



Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle Since 1965

Thank you for your attention!



Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle Since 1965