



# National and State Policy Incentives for Energy Efficiency & Renewables

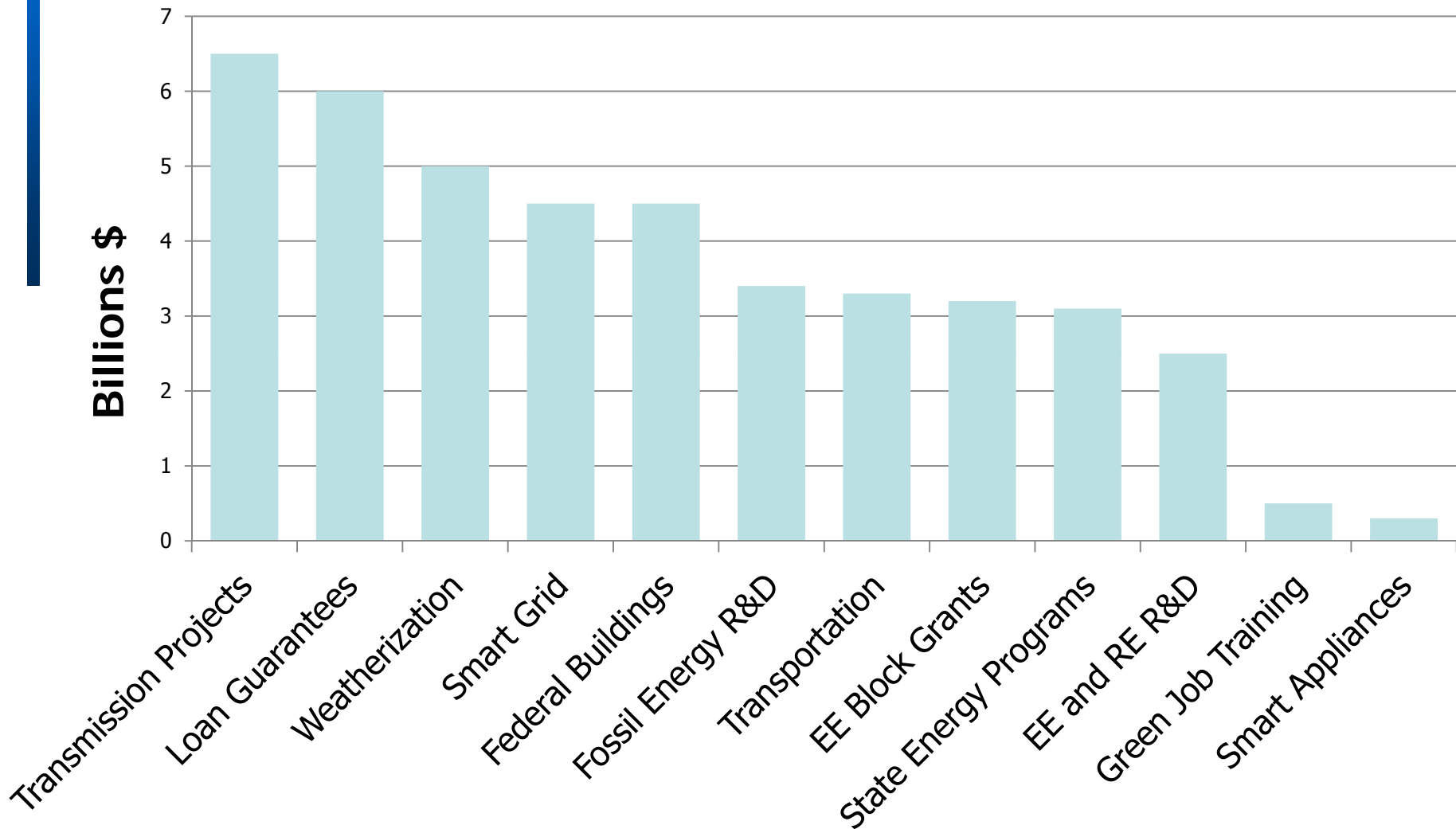
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# Outline

- Recent Federal Policies and Incentives
  - American Recovery and Reinvestment Act of 2009 (ARRA)
  - Other relevant recent Federal Policies
- Recent State Policies and Incentives
  - Renewable Portfolio Standards
  - Renewable Energy Certificates
  - Feed-In Tariffs
  - Energy Efficiency Portfolio Standards
  - Some Example State Policies

# ARRA Appropriations to Energy



- Total appropriations: \$43B + \$20B in tax incentives

Source: <http://appropriations.house.gov/pdf/PressSummary02-13-09.pdf>

# ARRA Policy Goals

- Immediate economic stimulus
- Jobs
- And...to a lesser degree
  - Innovative technology
  - Reduce greenhouse gases
  - Establish U.S. manufacturing capability
  - Rural development
  - Supply chain completeness
- Requirements to show goals are being met:
  - Tracking of jobs created/retained
  - Tracking of energy savings/\$ invested
  - Quarterly reporting of results to DOE
  - Required and aggressive project start dates

# Smart Grid

- **The Smart Grid is a system that uses digital technology to enhance the delivery and utilization of electricity through intelligent, real-time, distributed two-way communications.**
- Intended to help integrate renewables and EE into the electric power grid and optimize overall grid function – for 21<sup>st</sup> century
- As defined in EISA 2007, the smart grid may include:
  - Intelligent control of transmission and distribution automation;
  - distributed generation, including renewables;
  - demand response, demand-side resources and EE;
  - smart metering and energy monitoring, including smart appliances;
  - electricity storage and peak-shaving technologies, including plug-in vehicles and thermal-storage air conditioning;
  - standards for grid communication and interoperability.
- A number of pilot programs now underway nationally

# Federal Incentives

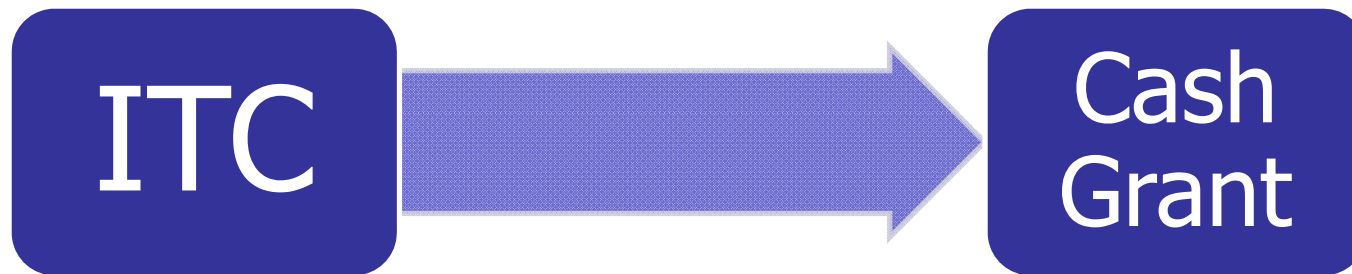
## Commercial Energy Efficiency

- Federal Buildings
  - \$4.5B for converting GSA facilities to High-Performance Green Buildings
  - Funds distributed through GSA or DOE by September 2011
- Commercial Buildings Tax Deduction
  - For owners of new or existing buildings
  - Must reduce building's power/energy cost by  $\geq 50\%$ 
    - As compared to ASHRAE Standard 90.1-2001
    - Energy savings must be calculated with qualified software
    - Interior lighting, building envelope, HVAC/hot water
  - \$0.30-\$1.80 per sq ft
  - For systems in service 2006-2013

# Federal Incentives: Commercial RE

- Production Tax Credit (PTC)
  - 10-year, inflation-adjusted tax credit (\$/kWh) based on the amount of power generated and sold to an unrelated party each year
  - In service by 2012: Wind
  - In service by 2013: Biomass, geothermal, LFG, MSW, hydro, marine
- Investment Tax Credit (ITC)
  - Tax credit realized in 1<sup>st</sup> year of operation; vests linearly over 5 years
  - 30%: Solar, fuel cell, small wind, qualified facility
  - 10%: Geothermal, microturbine, combined heat and power
  - Utility sector eligible as of October 2008
  - In service by 2016 (some exceptions)
- New Clean Renewable Energy Bond (CREB)
  - \$1.6B available to government, public power, and cooperatives
  - 0% interest—Bondholder receives federal tax credits instead
- Renewable Energy Cash Grants – see next slide

# Tax Incentives Extended and Convertible to Cash



## Investment Tax Credit

- Changes under TARP:
  - > Extended through 12/31/2016
  - > Available to utilities
- No reduction in tax basis for other incentives

## Cash Grant

- Eligibility
  - Placed in Service 2009 or 2010 OR
  - Construction begun in 2009 or 2010 AND placed in service by 12/31/2016
- Applications by 10/1/2011
- Must be U.S. taxpayer

# Bonus Depreciation

- Taxpayer can deduct 50% of capital cost of system after adjusting for ITC in the first year that the equipment is placed in service

- Example:

Cost of Solar Installation	\$10 Million
<u>30% ITC (taken as cash grant)</u>	<u>- \$3 million</u>
Depreciable basis	\$7 million

First Year Bonus Depreciation:  $50\% * \$7 \text{ million} = \$3.5 \text{ million}$

Balance to Depreciate in Future Years                      \$3.5 million

**Still requires sufficient domestic tax appetite, though not as significant as in previous years.**

# Federal Incentives

## Commercial EE & RE

- Job Training
  - \$500M for research, labor exchange, and job training for EE and RE
  - Available through 6/30/2010
- Federal Loan Guarantees
  - \$6B in loan guarantees
  - Must start construction by 9/30/2011
  - Eligible projects: RE manufacturing, RE generation, EE, and transmission
- Energy Conservation Bonds
  - \$3.2B available to state and local govs – for broad range of projects
  - > 0% interest—Bondholder receives federal tax credits instead
- Qualifying Advanced Energy Project Investment Tax Credit
  - 30% tax credit to establish, re-equip, or expand a facility that **manufactures** EE/RE technologies, energy storage, fuels

# Federal Incentives - Residential

- Residential Energy Efficiency Tax Credit
  - > EE improvements to building envelope of existing homes
  - > Up to \$1500
  - > For upgrades in 2009-2010
- Residential Renewable Energy Tax Credit
  - > Solar-electric, solar water-heating, fuel cell, small wind, and geothermal
  - > Credit for 30% of expenditures (up to max credit)
  - > For systems in service 2006-2016
- Tax Credit for Home Builders
  - > For builders of new EE homes
  - > \$2000 credit for site-built homes if energy reduced by 50% over International Energy Conservation Code
  - > \$1000-\$2000 for manufactured homes
  - > Builder must be certified—more information from IRS

# Other Pertinent Federal Policies

- Updated equipment standards in Energy Independence and Security Act of 2007 (EISA)
  - Commercial 3-stage central air conditioners under 65 kbtu/h = SEER 13 by June 2008
  - Light bulbs = 20-30% less energy by 2012-2014 and 60% less by 2030
  - Motors 1-200 HP = NEMA premium efficiency levels by 2010
  - Other motors previously excluded = EPACT 1992 levels by 2010
- Updated ASHRAE standards for new construction
  - State building code standards must meet or exceed ASHRAE 90.1-2004 by end of 2010
  - ASHRAE working on 2010 update to save 30% energy over 90.1-2004

# Meeting Federal Policy Goals

- Applications to DOE scored on how well they meet goals
  - Clearly state project's abilities to meet goals
  - Have a good, easy-to-understand business case
  - For new technology, assume DOE knows existing solutions and challenges—acknowledge them and explain your solutions
- DOE under time pressure to get through applications—**FOLLOW DIRECTIONS AND PROJECT REQUIREMENTS** closely
  - Provide all required information—DOE will probably not wait for updates
  - Do not provide links where data is requested
  - DOE will stop reading application after page limit
  - Provide complete environmental data
  - If permitting not completed, describe strategy for meeting requirements

# State Policies

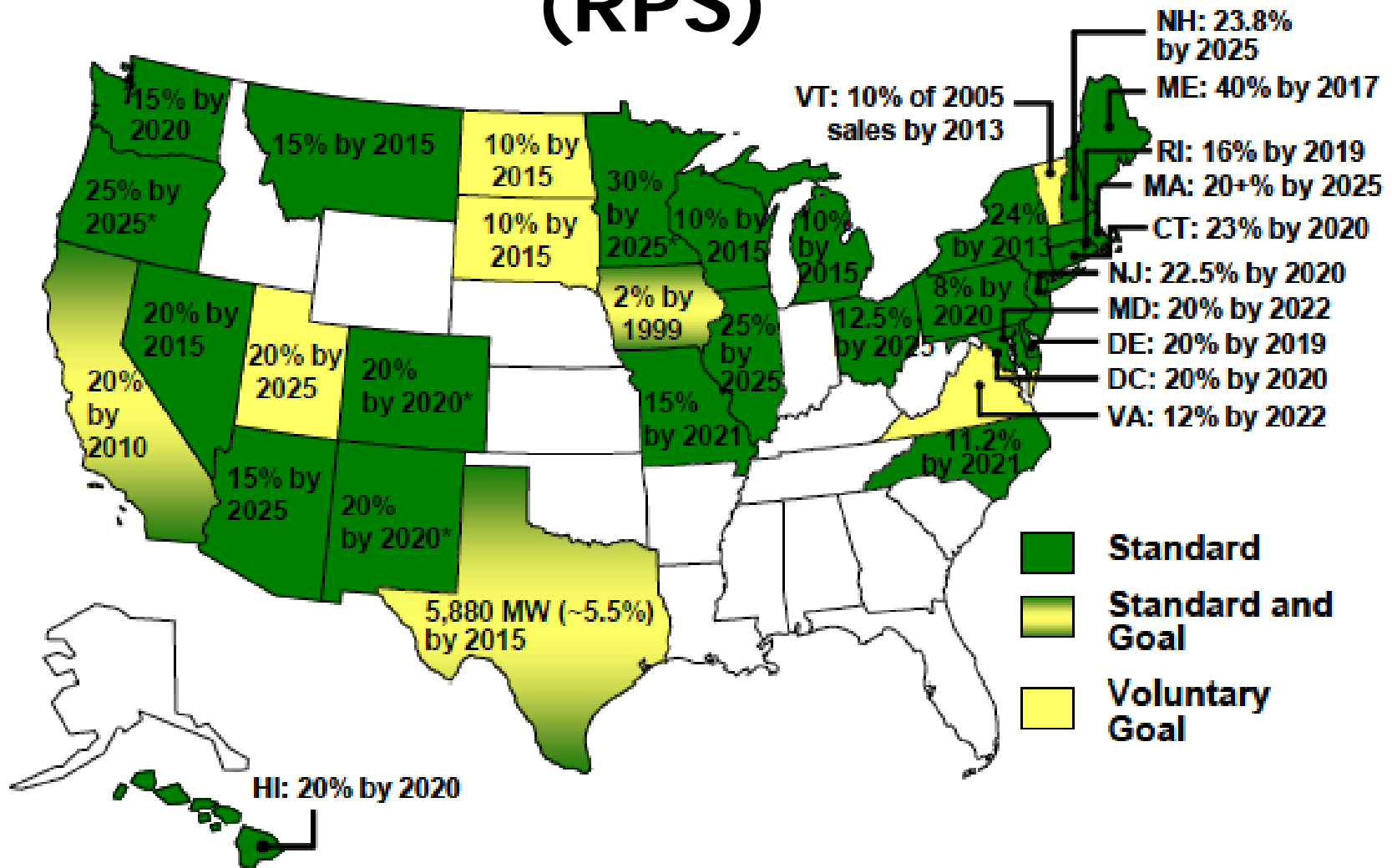
- Most state Public Utility Commissions now require electric and gas utilities to collect funds for and offer DSM programs
- Some are administered through third party administrators
  - Energy Trust of Oregon
  - Vermont Energy Efficiency Corporation (VEIC)
- Eligible measures vary by state and program
  - all sectors (C/I/Res) are generally covered by *some* DSM program
  - incentives are available to cover incremental measure cost, while providing demand side resources at a lower cost than new supply
- States like NJ have developed **Energy Master Plan** that combine EE/RE goals and planning

# Energy Efficiency Portfolio Standards (EEPS)

- Energy Efficiency Portfolio Standards (EEPS)
  - > EEPS included in state RPS: HI, NV, NC
  - > Federal standard recently proposed in Congress (10-15%)



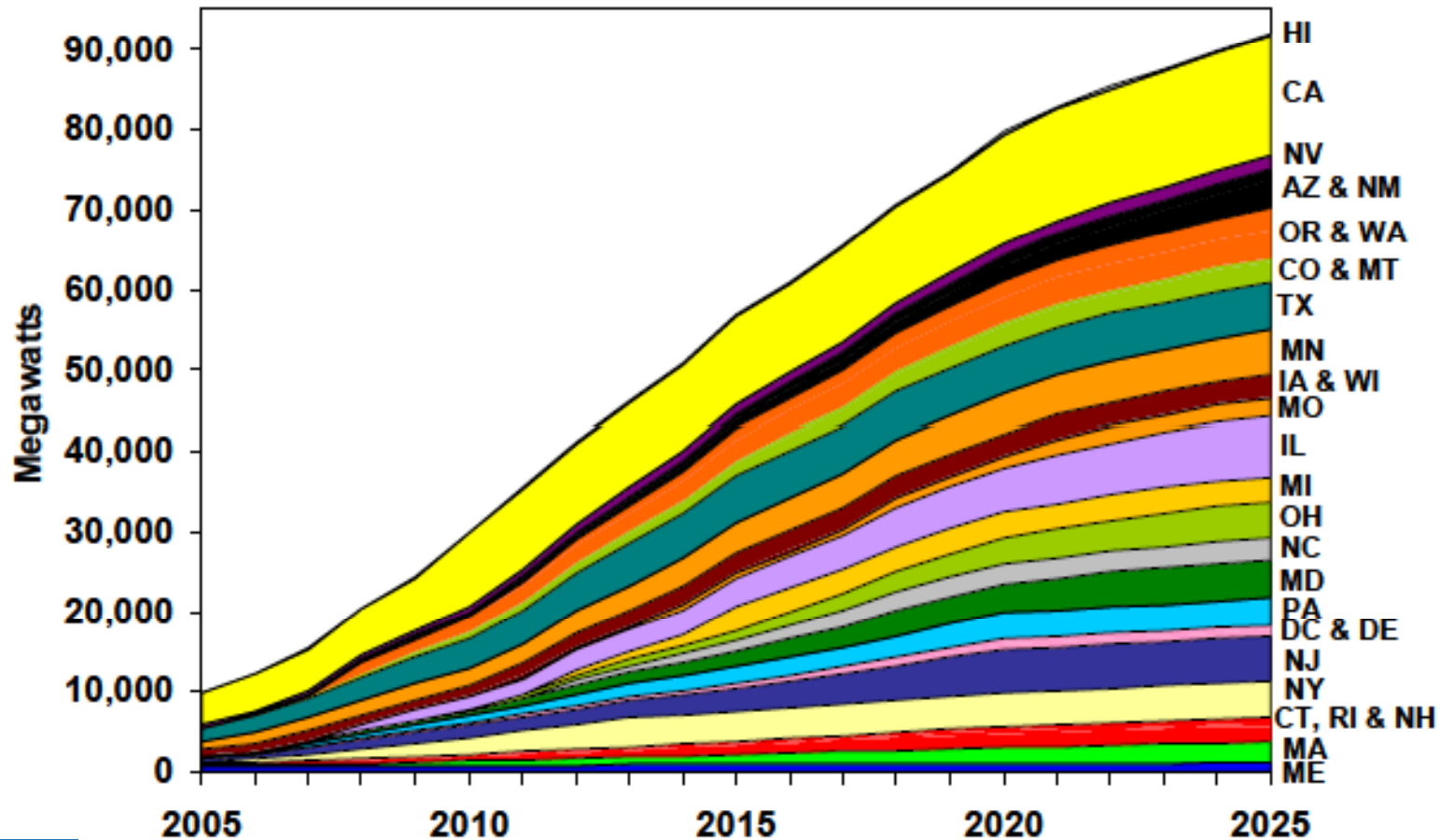
# Renewable Portfolio Standards (RPS)



Source: "Renewables Electricity Standards at Work in the States", Union of Concerned Scientists, 2009.

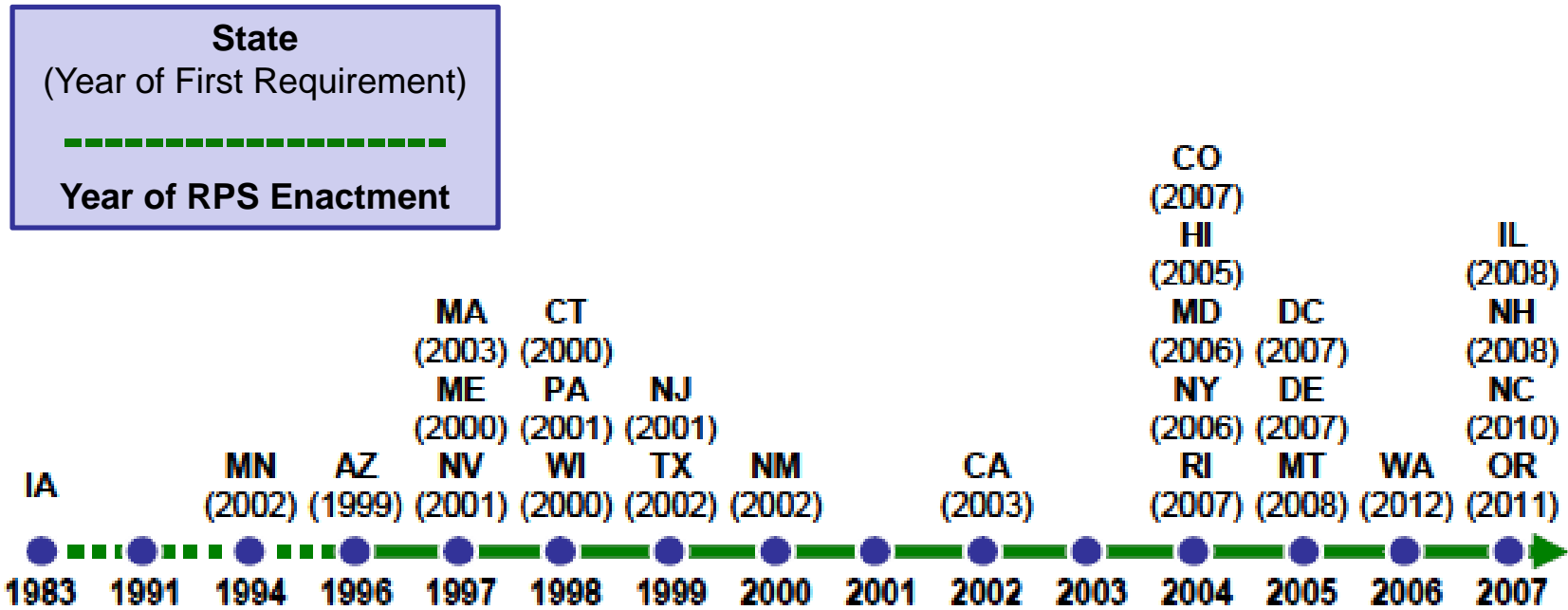
# Renewable Portfolio Standards (RPS)

Renewable Energy Expected From State Standards\*



\* Projected development assuming states achieve annual renewable energy targets.  
 Source: "Renewables Electricity Standards at Work in the States", Union of Concerned Scientists, 2009.

# Renewable Portfolio Standards (RPS)

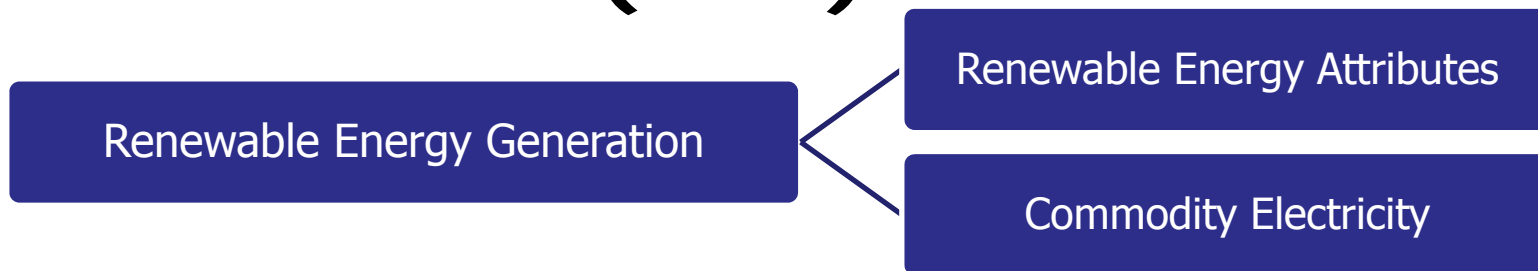


**Federal RPS introduced recently: S433 by Udall brothers = 25% by 2025**



Source: Wisner, R., and G. Barbose, "Renewables Portfolio Standards in the United States — A Status Report with Data Through 2007", LBNL, April 2008.

# Renewable Energy Certificates (REC)

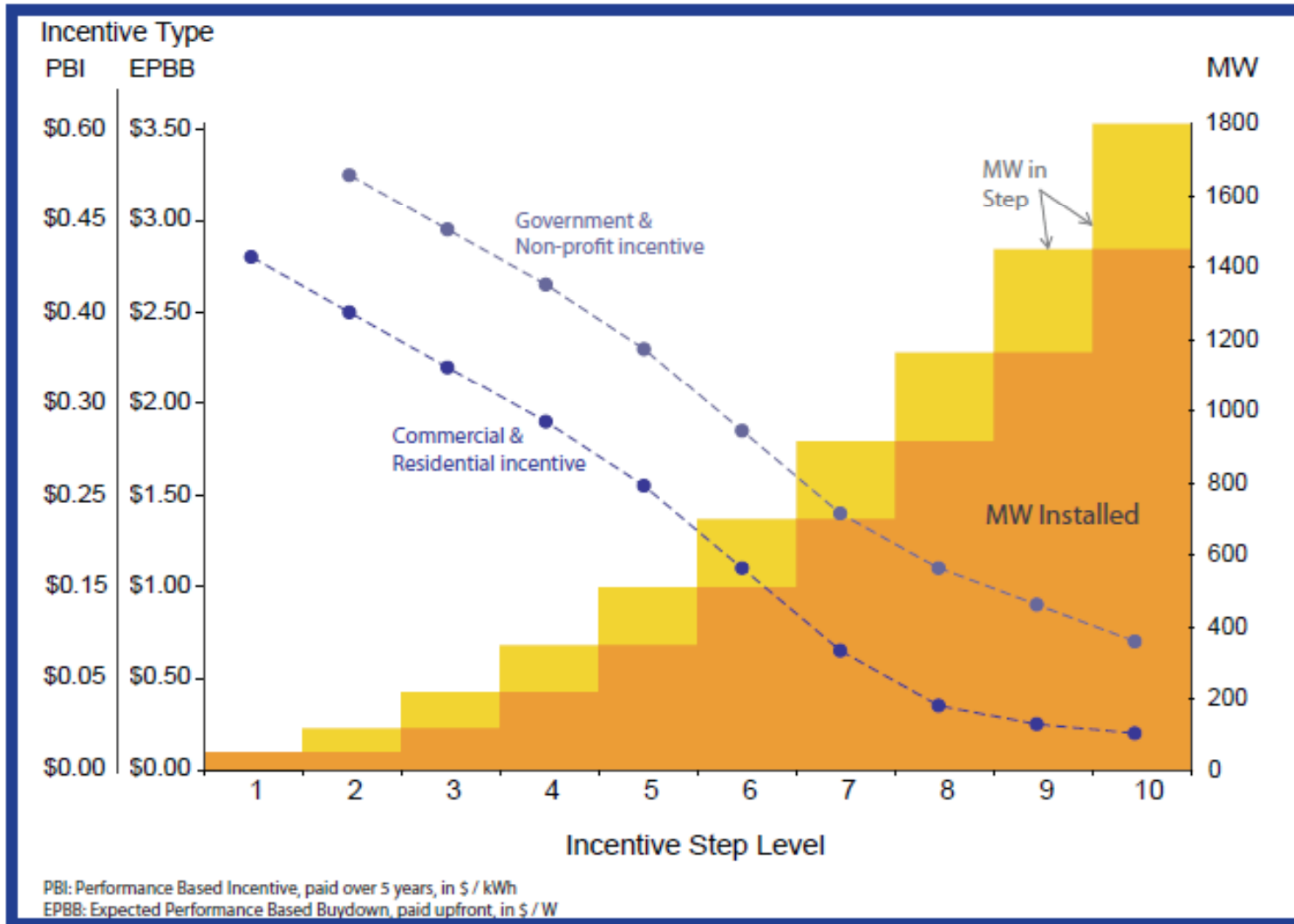


- Represents the “attributes” (i.e. emissions, type, etc.) of renewable energy generation that can have value separate from commodity electricity
  - 1 REC = 1 MWh of electricity
  - AKA green tags and tradable renewable energy certificates
- Traded in both compliance and voluntary markets
- State policies on RECs different for RPS compliance
  - Attributes and electricity traded together (i.e. “bundled”)
  - Attributes traded separately from electricity (i.e. “unbundled”)
    - Not geographically-restricted to local generation
- Price often capped by an Alternative Capacity Payment (ACP)

# Feed-In Tariffs (FIT)

- **Guarantees utility will buy electricity from PV systems at a fixed \$/kWh rate for a specific number of years**
- Germany drives global solar market with this mechanism
- Florida – Gainesville Regional Utilities
  - 1<sup>st</sup> solar PV FIT in the US
  - Guaranteed \$0.32/kWh of electricity produced for 20 yrs
  - Adopted February 2009: already reached 1<sup>st</sup>-year target of 4 MW
- Ontario – Ontario Power Authority
  - Most comprehensive FIT system proposed in North America
  - May result in solar PV as 1% of electricity supply
- California
  - Originally for water/wastewater facilities
  - Now IOUs can offer FIT for all renewable projects under 1.5 MW
  - FIT still limited: looking into policy options for expansion
- Other states developing FITs include HI, WA, OR, WI, MI, MN

# State RE Example: California



Source: California Solar Initiative CPUC Staff Progress Report – January 2009.

# State Example: New York

- RPS (2004)
  - 25% from renewables by 2013
  - 3,479 GWh of renewables added in 2005-2008
  - NYSERDA trades unbundled RECs for compliance
- Net metering (Aug 2008) now includes non-res PV & wind
- Property Tax Abatement for PV Equipment (August 2008)
  - 5 - 8.75% of expenditures per year for projects in NYC
- Energy \$mart Loan Fund (NYSERDA)
  - Reduced-interest rate loans for EE or RE projects
  - Application due 7/31/2009 for all non-commercial projects
- State Rebate Program (NYSERDA)
  - Solar PV: through 9/30/2009, Fuel cells: through 5/29/2009
  - Small wind: through 12/31/2009
  - Energy \$mart Multifamily Performance: through 6/30/2011
  - Energy \$mart New Construction: through 3/31/2009

# Recommended Websites

- Database of State Initiatives for Renewables & Efficiency:  
[www.dsireusa.org](http://www.dsireusa.org)
- Tax Incentives Assistance Project:  
[www.energytaxincentives.org](http://www.energytaxincentives.org)
- Energy Star – Federal Tax Credits for Energy Efficiency:  
[http://www.energystar.gov/index.cfm?c=products.pr\\_tax\\_credits#s8](http://www.energystar.gov/index.cfm?c=products.pr_tax_credits#s8)



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