



Environmental Energy Technologies Division Lawrence Berkeley National Laboratory

# Renewables Portfolio Standards in the United States: A Status Update

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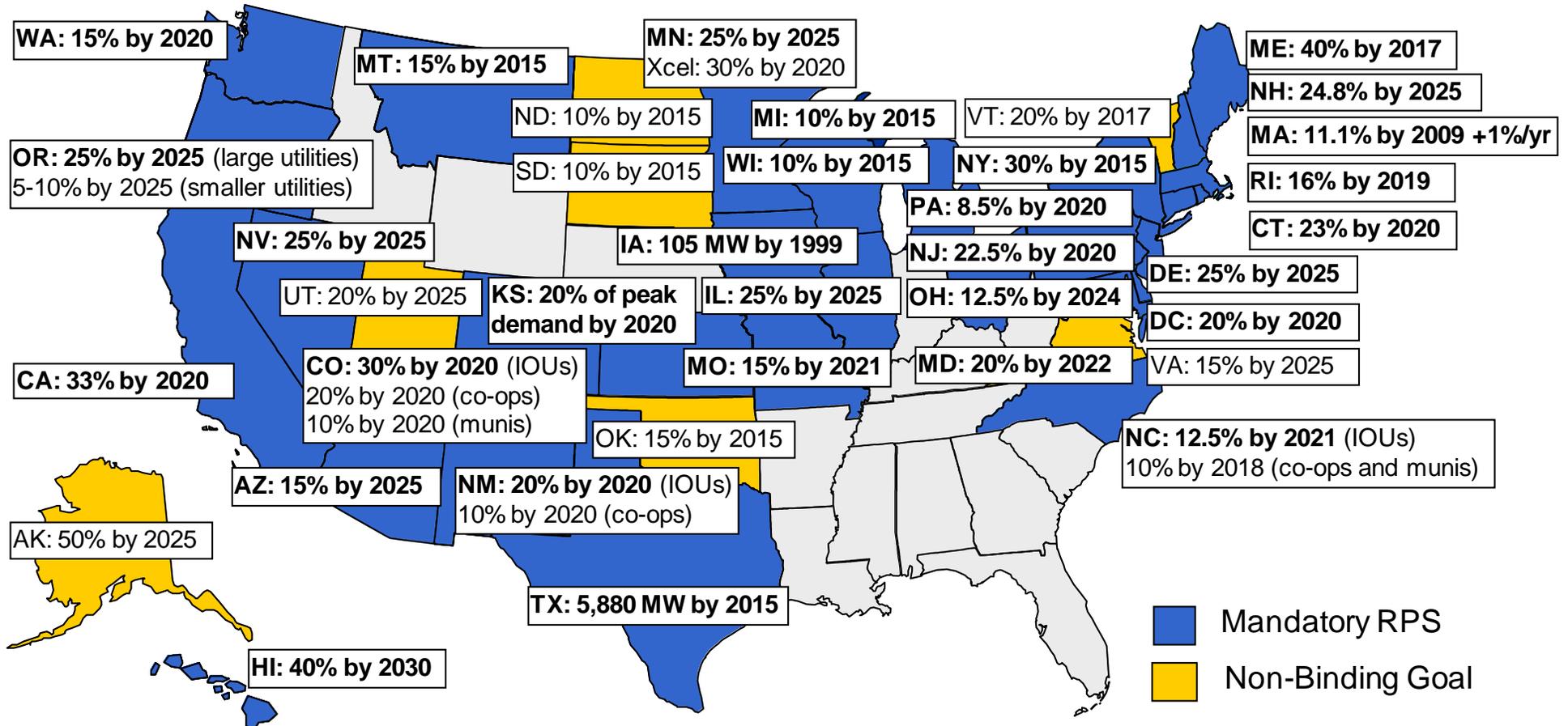
**November 19, 2013**

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# RPS Policies Exist in 29 States and DC

## 7 More States Have Non-Binding Goals

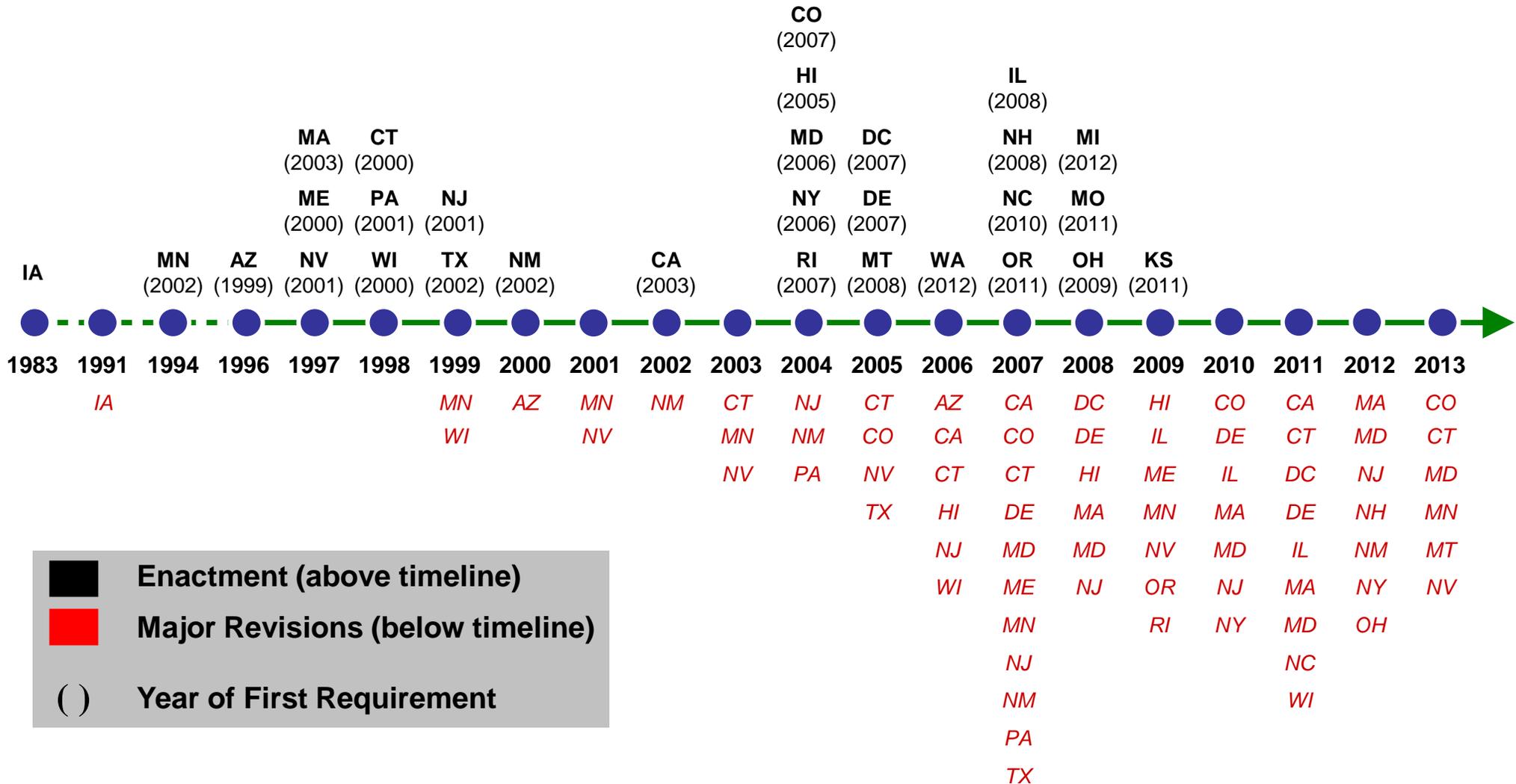
Existing State RPS Policies Apply to 55% of Total U.S. Retail Electricity Sales in 2012



Source: Berkeley Lab

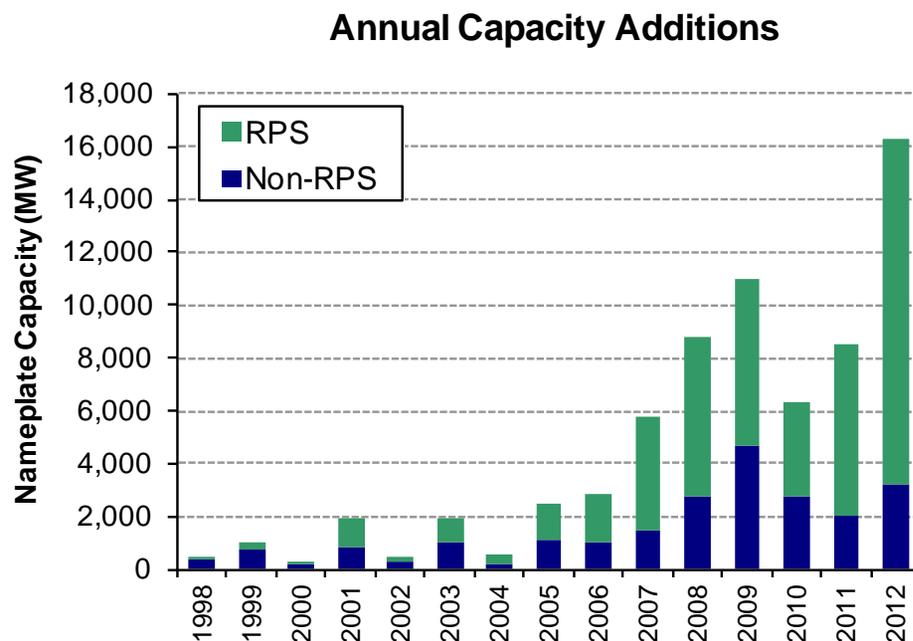
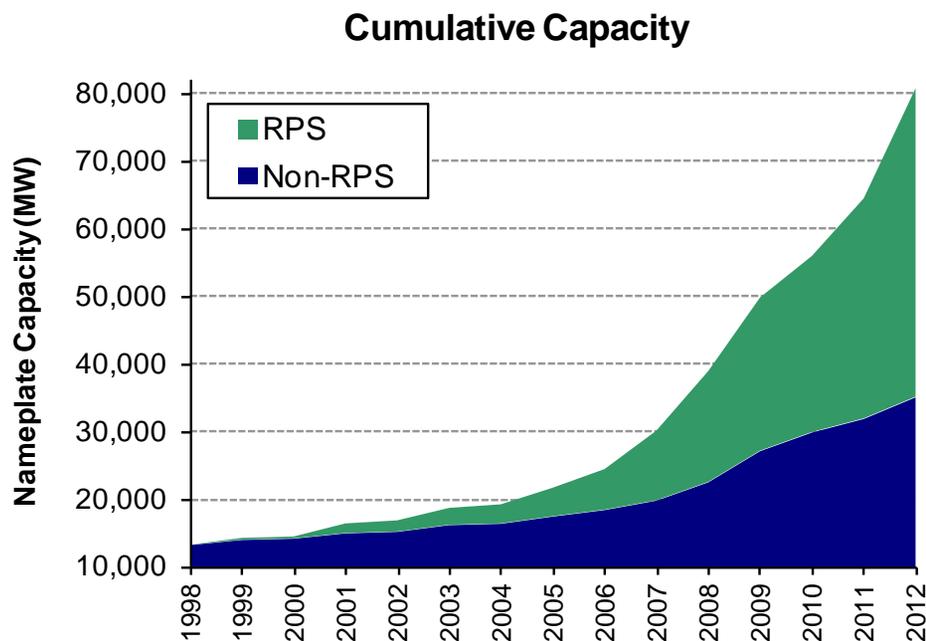
Notes: Compliance years are designated by the calendar year in which they begin. Mandatory standards or non-binding goals also exist in US territories (American Samoa, Guam, Puerto Rico, US Virgin Islands)

# Enactment of New RPS Policies has Waned, but States Continue to Hone Existing Policies



# State RPS Policies Appear to Have Motivated Substantial Renewable Capacity Development

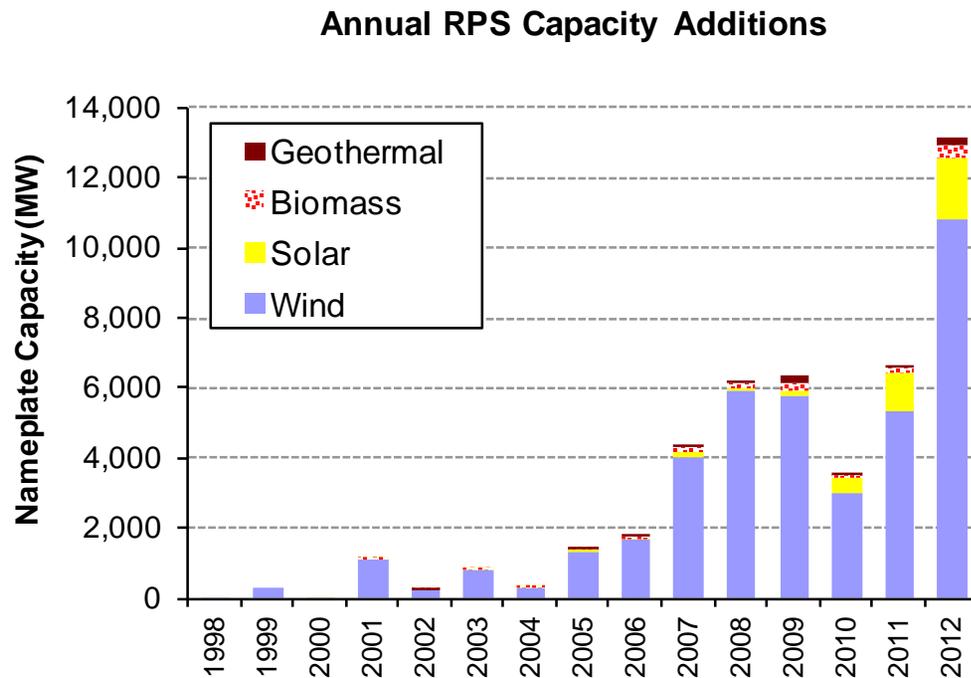
## Cumulative and Annual Non-Hydro Renewable Energy Capacity in RPS and Non-RPS States, Nationally



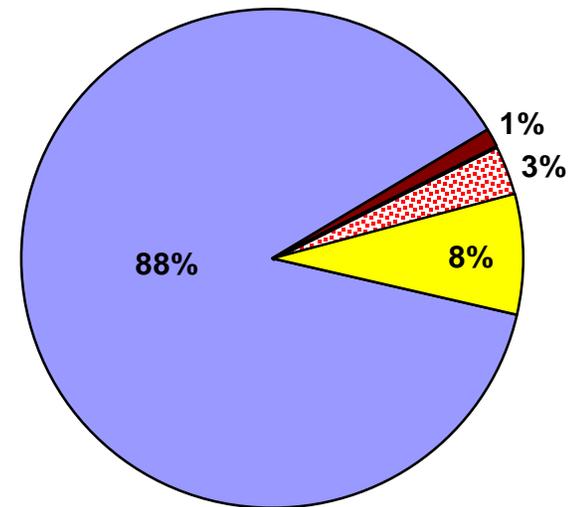
Though not an ideal metric for RPS-impact, **67% (46 GW)** of all non-hydro renewable capacity additions from 1998-2012 occurred in states with active/impending RPS compliance obligations

# State RPS' Have Largely Supported Wind, Though Solar Has Become More Prominent

## RPS-Motivated\* Renewable Energy Capacity Additions from 1998-2012, by Technology Type

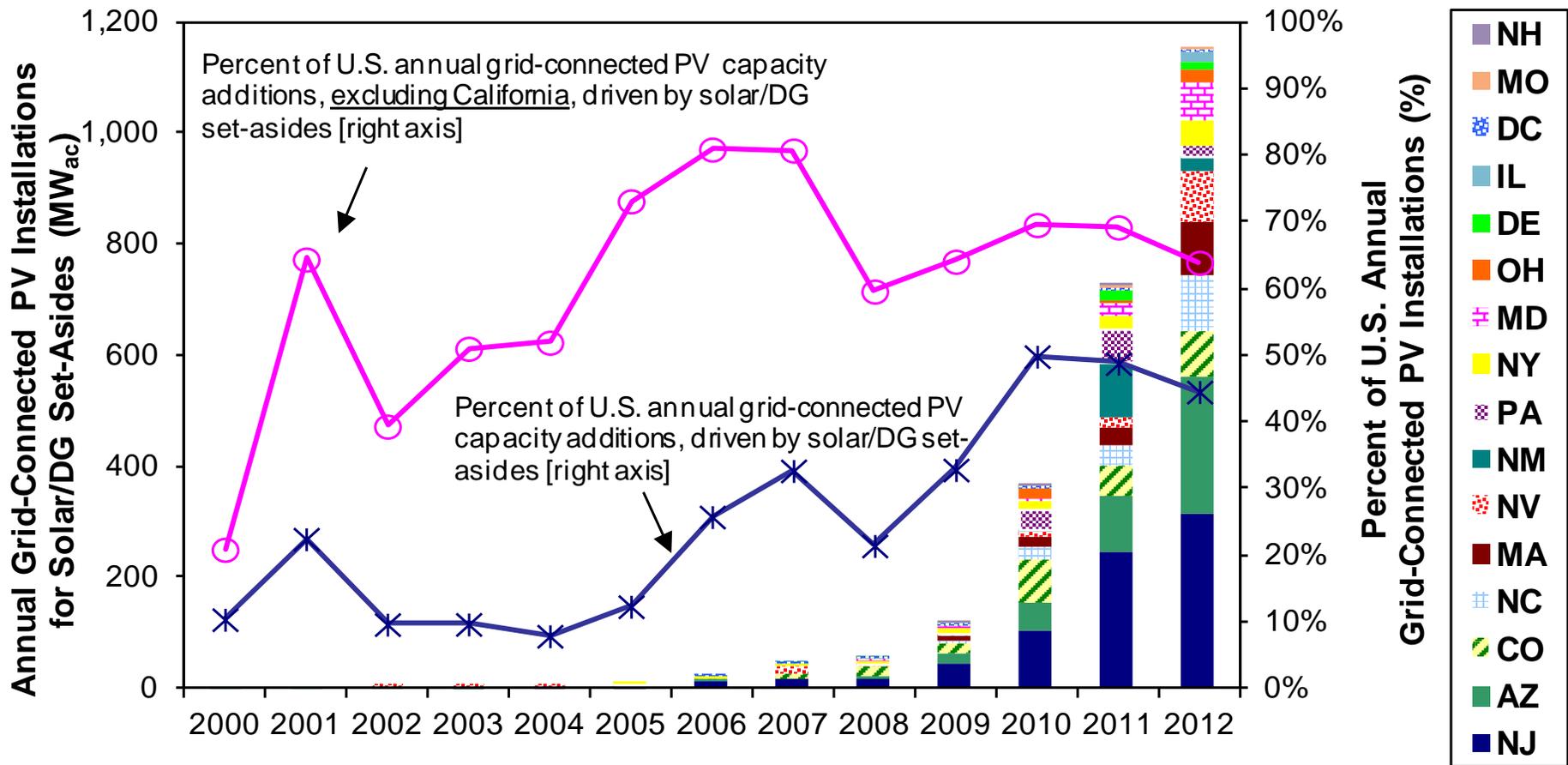


**Cumulative RPS Capacity Additions (1998-2012)**



\* Renewable additions are counted as "RPS-motivated" if and only if they are located in a state with an RPS policy and commercial operation began no more than one year before the first year of RPS compliance obligations in that state. On an energy (as opposed to capacity) basis, wind energy represents approximately 85%, biomass 8%, solar 4%, and geothermal 3% of cumulative RPS-motivated renewable energy additions from 1998-2012, if estimated based on assumed capacity factors.

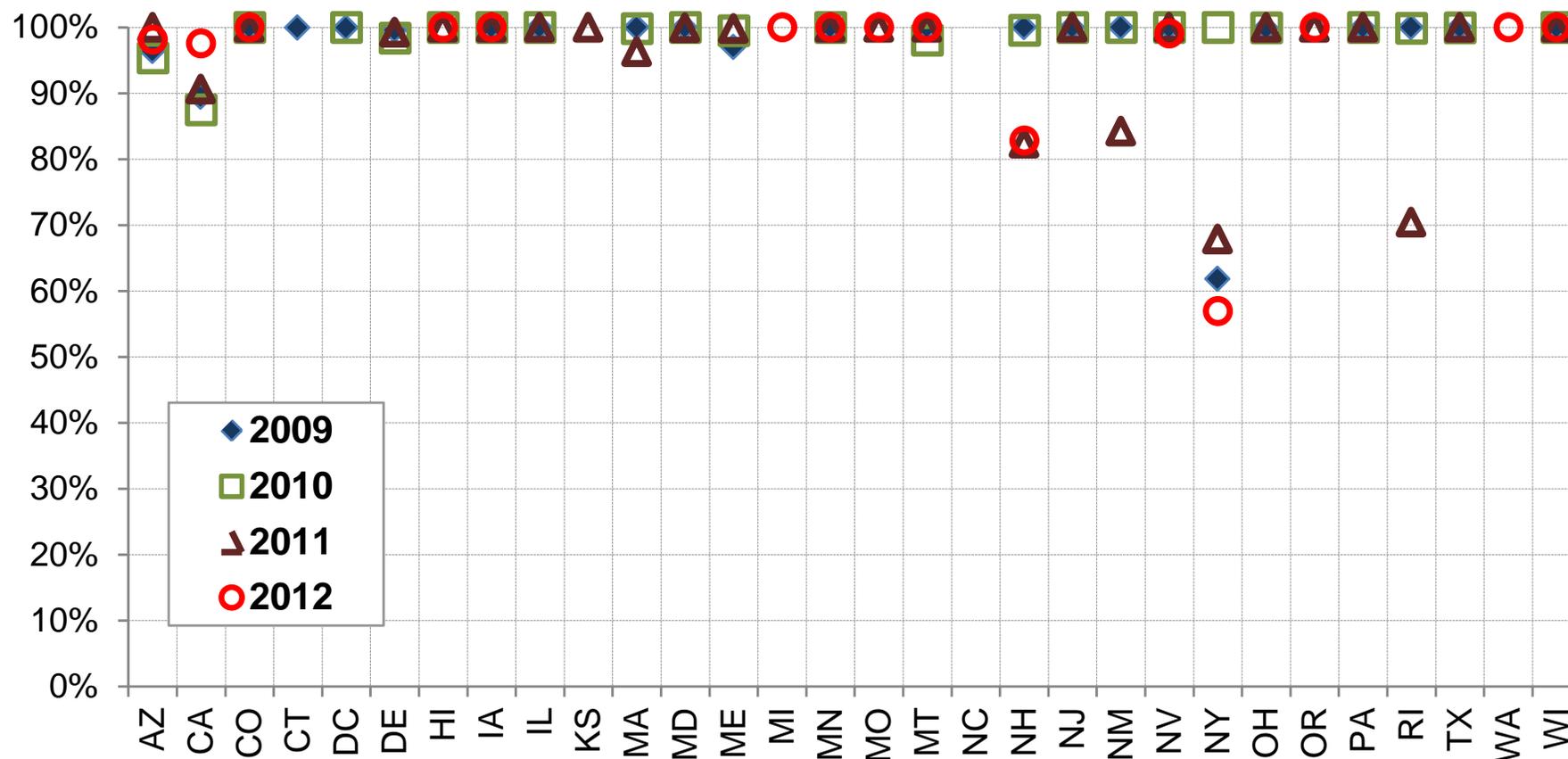
# Impact of Solar/DG Set-Asides is Growing: Drove ~50% of U.S. PV Additions in 2010-12



General RPS obligations also driving significant solar additions in California and Southwest

# Main Tier RPS Targets Largely Achieved; Isolated Struggles Apparent

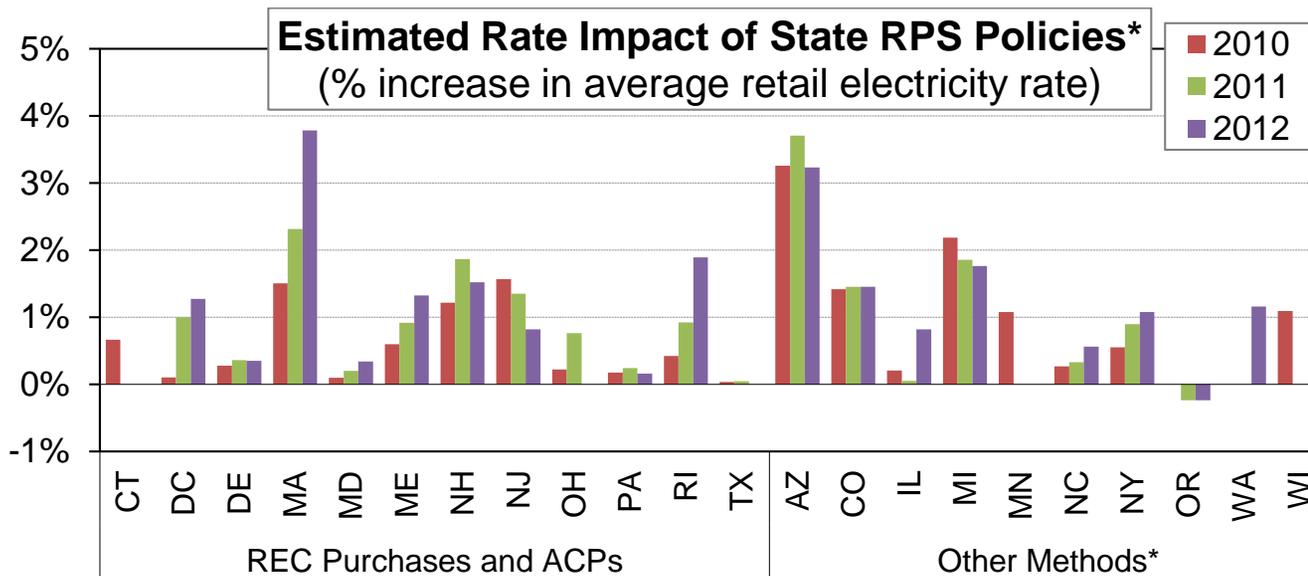
Percent of Main Tier RPS Target Met with Renewable Electricity or RECs  
(including available credit multipliers and banking, but excluding ACPs and borrowing)



Note: Percentages less than 100% do not necessarily indicate that “full compliance” was not technically achieved, because of ACP compliance options, funding limits, or force majeure events.

# Rate Impacts of State RPS Policies Have Thus Far Been Generally 'Modest' (<2%)

Translating REC prices or other available data on net incremental costs into retail rate impacts yields the results shown below



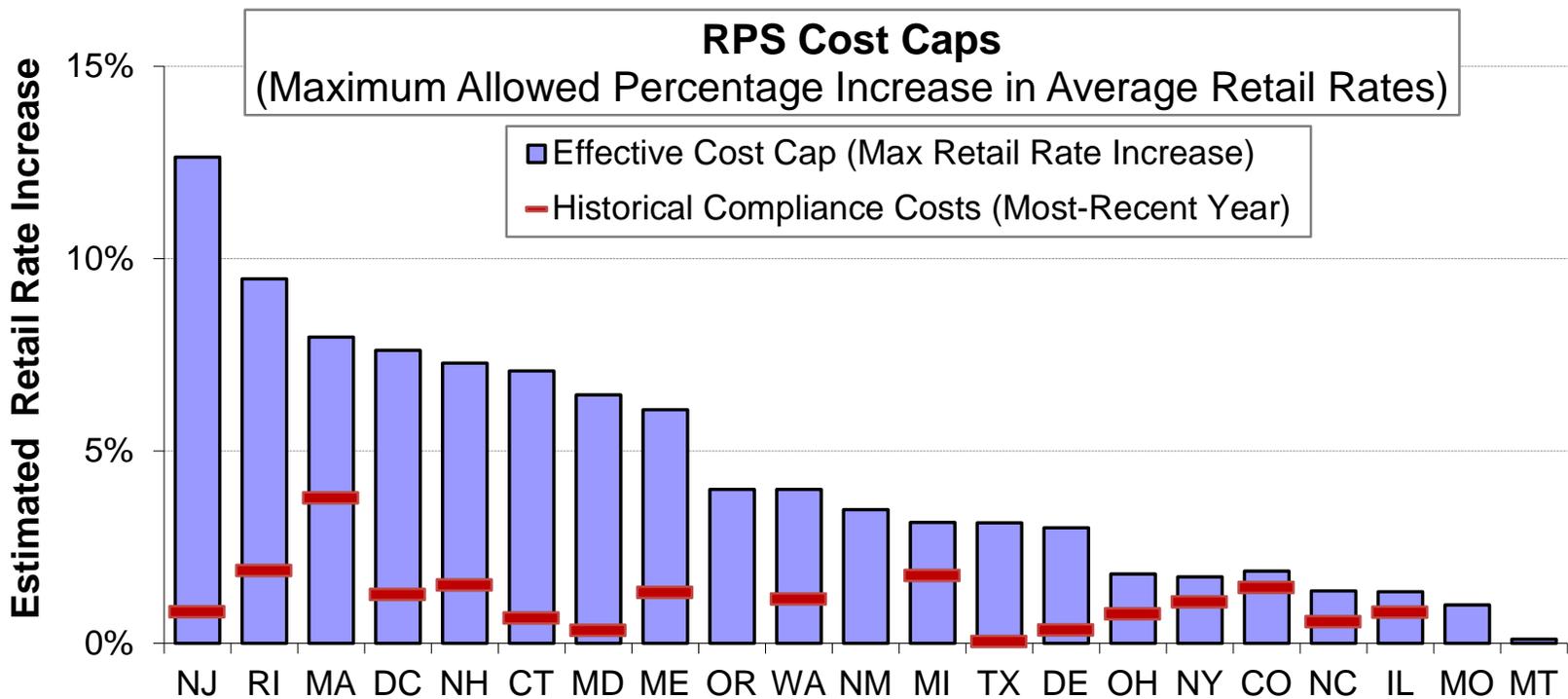
\* Other Methods for estimating rate impacts include RPS surcharge collections (AZ, CO, MI, NC), budget (NY), utility-reported incremental costs (OR, MN, WA), PUC analysis (IL, WI). States omitted if data on RPS incremental costs are unavailable (CA, IA, HI, KS, MO, MT, NM, NV).

- Simplified approach ignores some ratepayer costs (e.g., integration) and benefits (e.g., wholesale electricity price suppression)
- Limited/mixed data for states dominated by bundled contracts
- Rate impacts vary with target levels, REC prices, presence of set-asides, procurement mechanisms

Future compliance costs will be impacted by increasing RPS targets, changes to fed. tax incentives, and trajectories of RE costs and natural gas prices (among other factors)

# Most States Have Capped Rate Impacts Well Below 10% (13 States Below 5%)

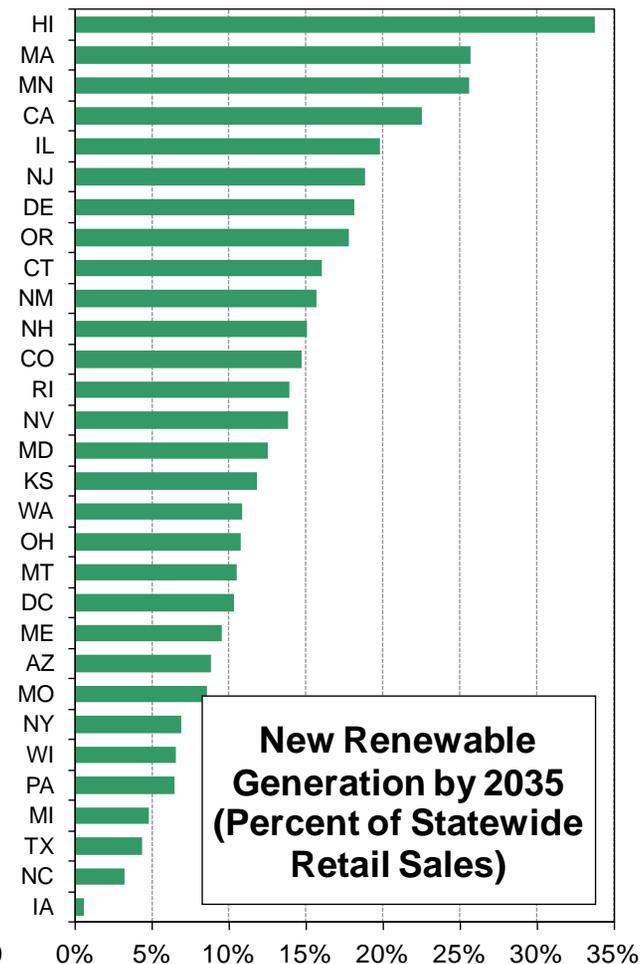
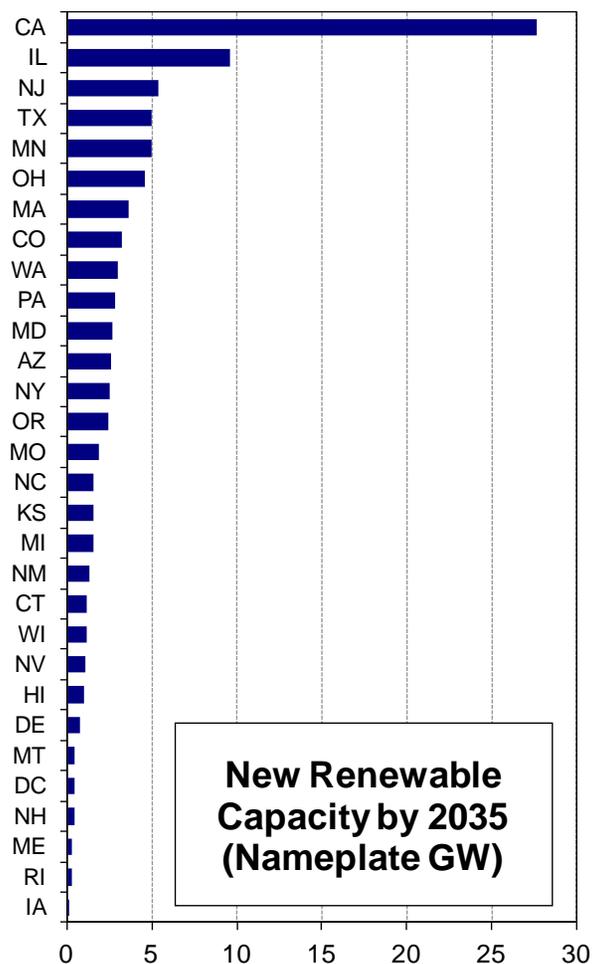
Many states' cost containment mechanisms can be translated into an estimated maximum increase in retail rates



No explicit cap on incremental compliance costs in 9 states (AZ, CA, IA, KS, HI, MN, NV, PA, WI), though KS caps gross revenue requirements and CA is currently developing its cost containment mechanism

# Future RPS Requirements are Sizable, But Well Within Recent RE Growth Rates

- **94 GW** of “New RE” required by 2035, if full compliance is achieved
- Equates to roughly **3-5 GW/yr** through 2020 and **2-3 GW** through 2035
- By comparison, RPS-driven RE additions have ranged from **6-13 GW/yr** in all but one year since 2008



\* New RE is defined based on state-specific distinctions between new vs. existing, or based on the year in which the RPS was enacted; it does not represent new renewables relative to current supply

# The Future Role and Impact of State RPS Programs Will Depend On...

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- The outcome of ongoing and future legislative and legal challenges
- Whether cost caps become binding
- The ever-present possibility of federal energy legislation
- How policymakers re-tune RPS' in response to changing market conditions
- Continued efforts to address challenges associated with volatile REC prices and limited availability of long-term contracts in restructured retail electricity markets
- How other related issues and barriers affecting RE deployment are addressed (transmission, integration, siting, EPA/environmental regulations, net metering, etc.)

# Thank You!

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## For further information:

**LBL RPS publications and resources:**

*[rps.lbl.gov](http://rps.lbl.gov)*

**LBL renewable energy publications:**

*<http://emp.lbl.gov/research-areas/renewable-energy>*

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