
State of the States: Update on RPS Policies and Progress

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Presentation Outline

- 1) Overview of State RPS Landscape
- 2) Policy Design Variations
- 3) Impacts: Past and Future
- 4) Emerging Issues and Challenges

What Is a Renewables Portfolio Standard?

Renewables Portfolio Standard (RPS):

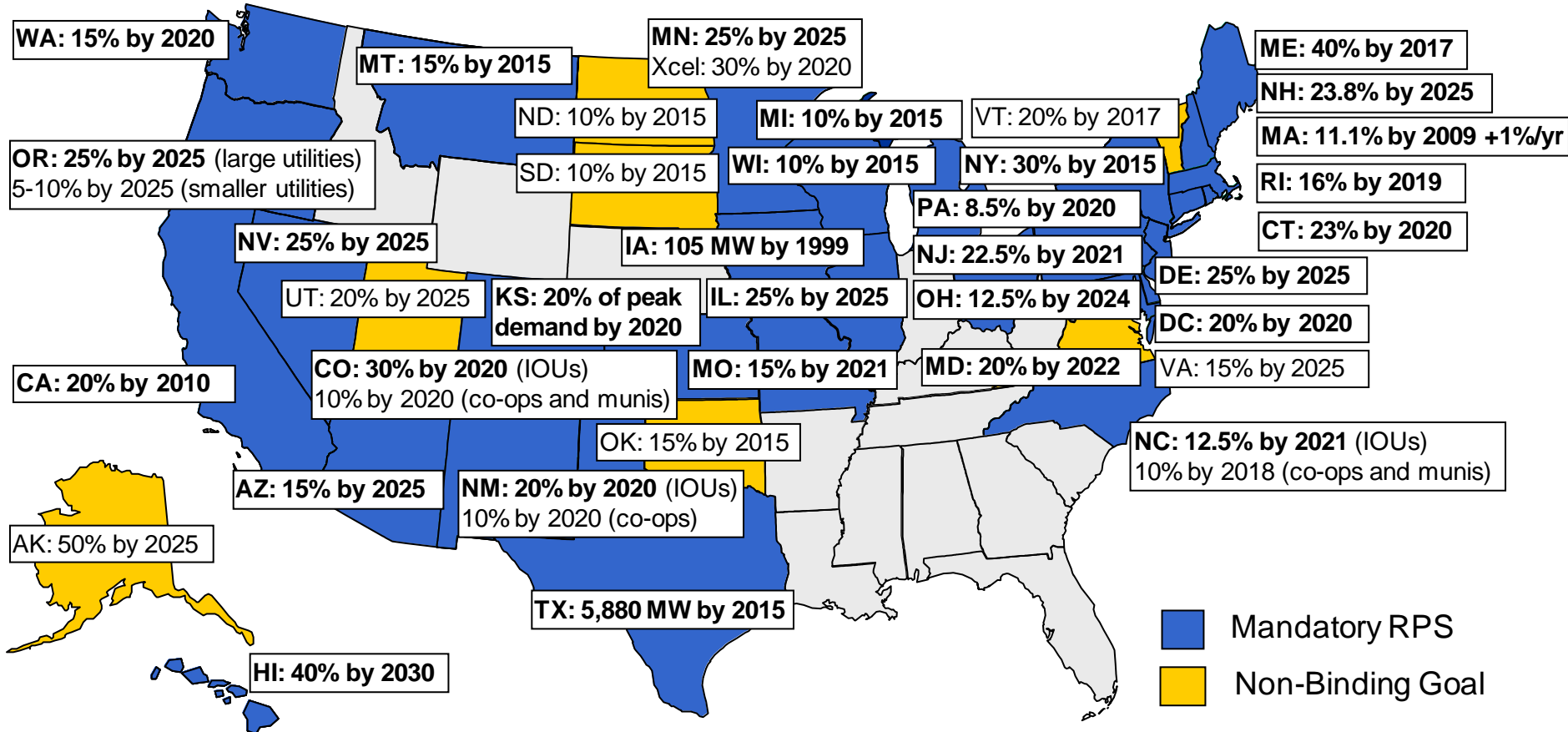
- A requirement on retail electric suppliers...
- to supply a minimum percentage or amount of their retail load...
- with eligible sources of renewable energy.

Typically backed with penalties of some form

Often accompanied by a tradable renewable energy credit (REC) program, to facilitate compliance

Never designed the same in any two states

RPS Policies Exist in 29 States and D.C.; 7 More States Have Non-Binding Goals

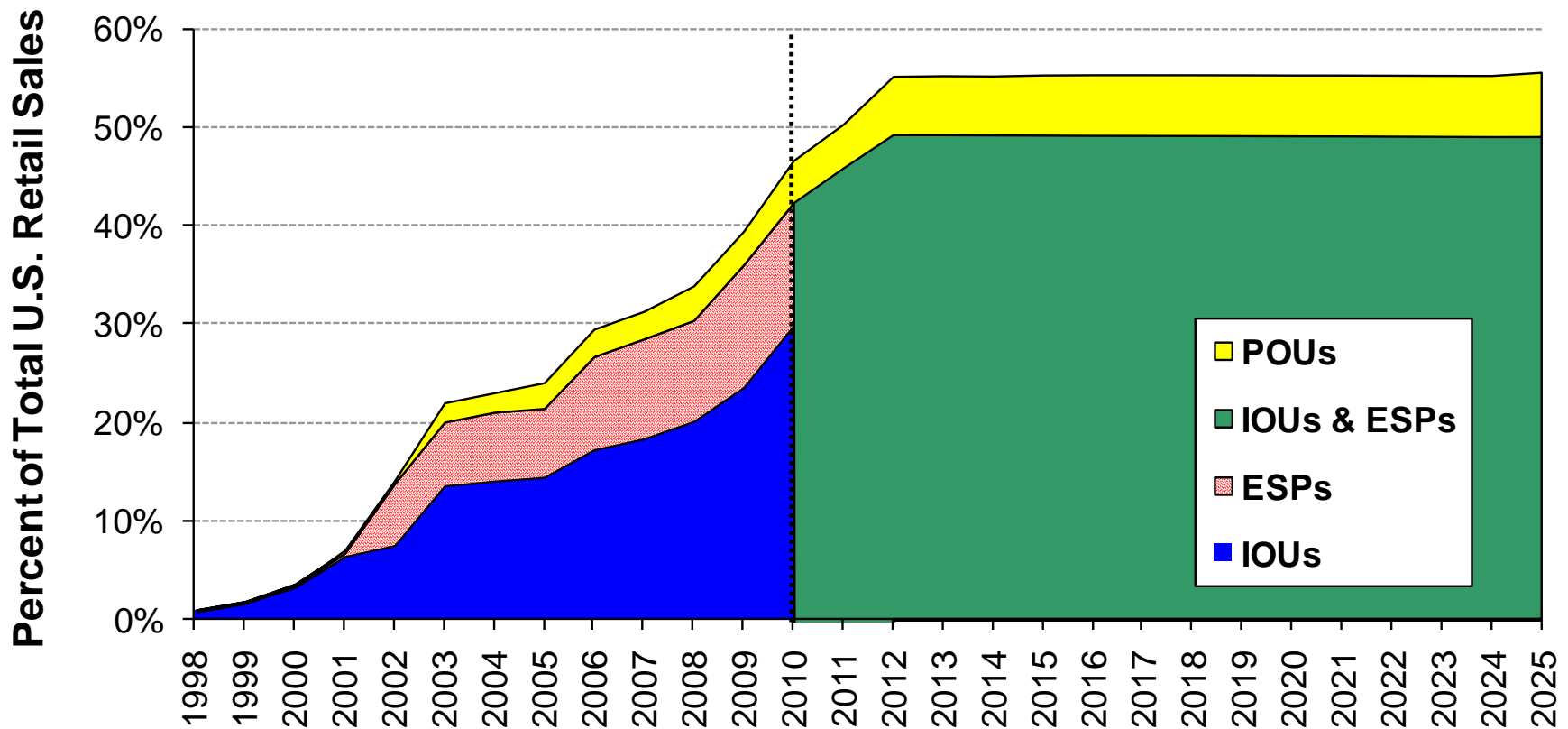


Source: Berkeley Lab

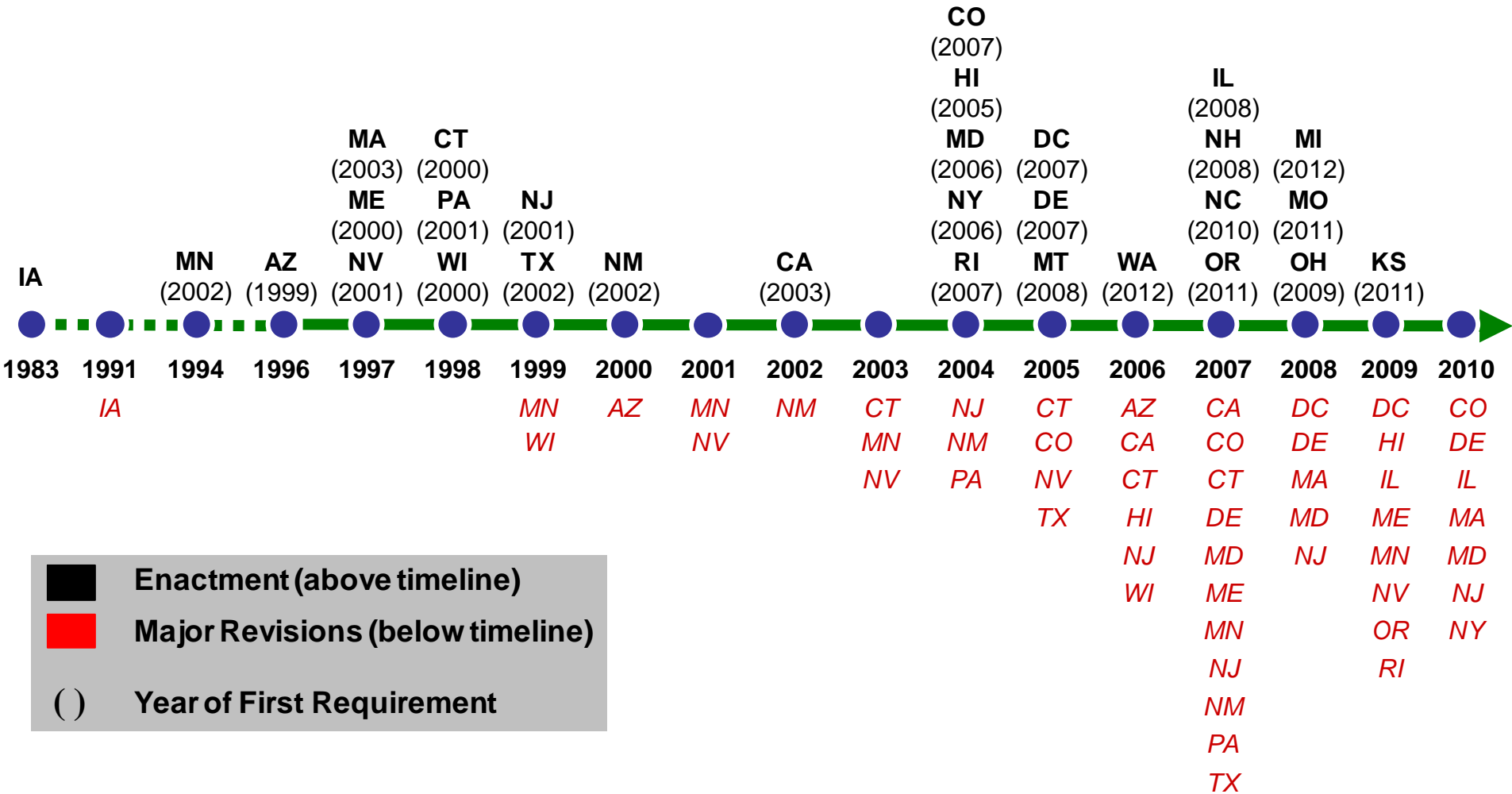
Most policies established through state legislation, but some through regulatory action (NY, AZ) or ballot initiatives (CO, MO, WA)

Existing RPS' Apply to 47% of U.S. Load in 2010 (Will Apply to 56% Once Fully Implemented)

U.S. Electrical Load with Active State RPS Obligations (Historical and Projected)



Enactment of New RPS Policies Is Waning, But States Continue to Hone Existing Policies



Enactment (above timeline)
 Major Revisions (below timeline)
 () Year of First Requirement



Notable Recent and Proposed Developments

State RPS Developments in 2010 (to-date)

- CA: Increase of RPS to 33% by 2020 under development; RECs allowance in limbo
- CO: Increased RPS to 30% by 2020; adopted new DG set-aside requiring 3% by 2020 (½ must be “retail DG”), in place of previous solar set-aside
- DE: Increased RPS to 25% by 2025; raised solar target to 3.5% by 2025; ended blanket exemption for munis and coops
- IL: Added interim targets for solar set-aside (2012-2015, IOUs only)
- MA: Developed regulations for solar set-aside, including annual SREC auction
- MD: Accelerated early-year targets for solar set-aside; raised solar ACP
- NJ: Increased and extended targets for solar set-aside to 5,316 GWh by 2025; requires rolling 15-year SACP schedule; automatic solar target adjustment
- NY: Increased RPS to 30% by 2015; augmented funding

General Trends in New/Revised RPS Programs

- Increased stringency of RPS purchase targets
- Expanded applicability to POUs, with greater leniency often provided
- Expanded use of more-aggressive solar/DG set-asides

State RPS Policies Feature Significant Design Differences

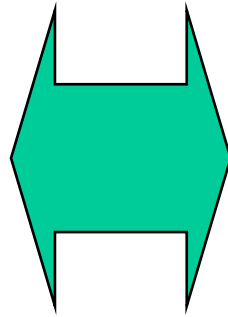
- Renewable purchase targets and timeframes
- Entities obligated to meet RPS, and use of exemptions
- Eligibility of different renewable technologies
- Whether existing renewable projects qualify
- Treatment of out-of-state generators
- Whether technology set-asides or other tiers are used
- Use of credit multipliers for favored technologies
- Allowance for RECs, and REC definitions
- Methods to enforce compliance
- Existence and design of cost caps
- Compliance flexibility rules, and waivers from compliance
- Contracting requirements and degree of regulatory oversight
- Compliance filing and approval requirements
- Compliance cost recovery
- Role of state funding mechanisms

Structure of RPS: RPS Compliance Models Vary Substantially

Regulated Markets

Dominated by long-term bundled contracts for electricity and RECs

Utility RFP solicitations or bilateral negotiations, with regulatory oversight



Restructured Markets

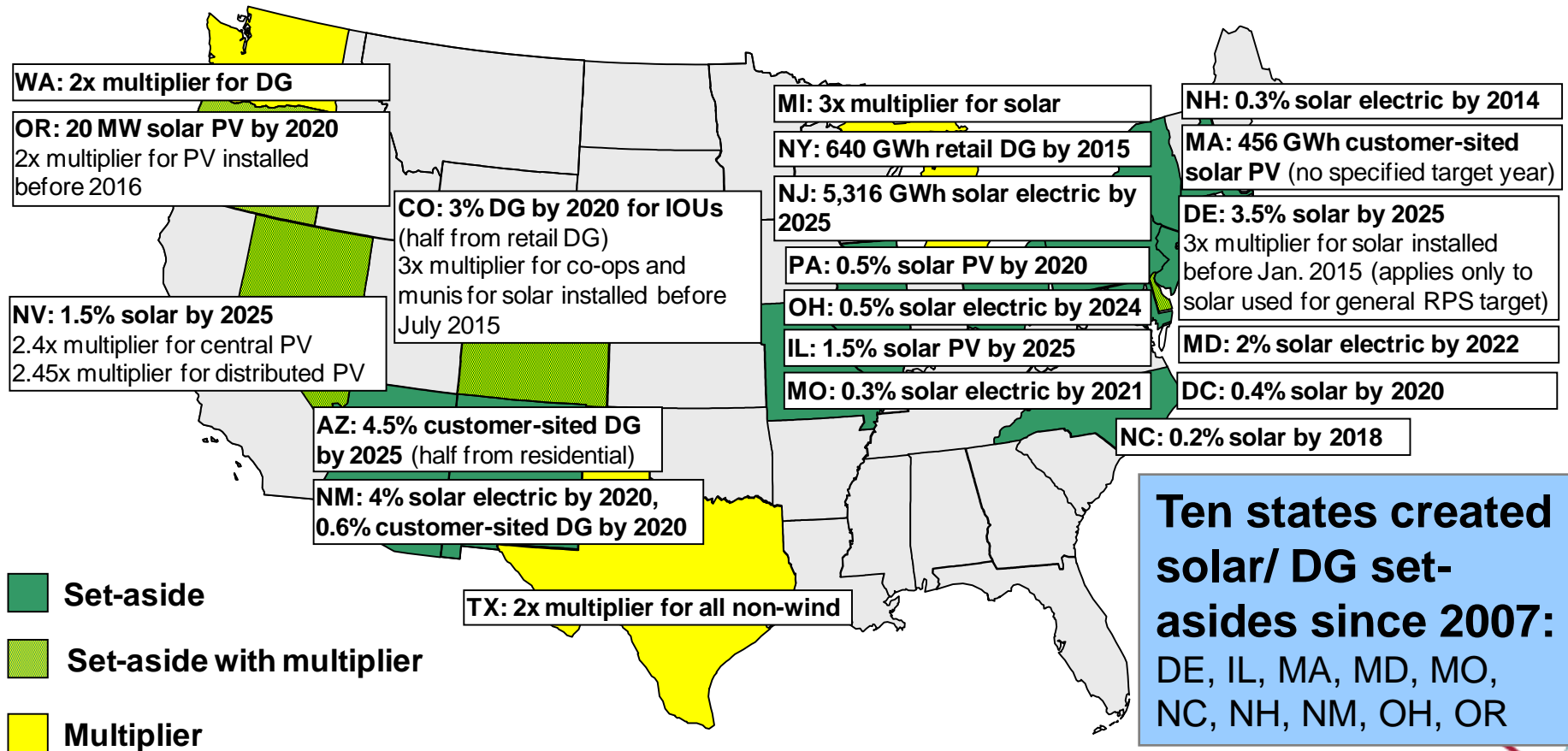
More often dominated by short-term trade in RECs, without PUC oversight

Developers often sell electricity and RECs separately

Two states require a government-directed agency to conduct procurements under the RPS: New York and Illinois

Solar/DG-Specific RPS Designs Becoming Common Nationwide

16 states + D.C. have solar or DG set-asides, sometimes combined with credit multipliers; 3 other states only have credit multipliers



Operational Experience with State RPS Policies Remains Somewhat Limited

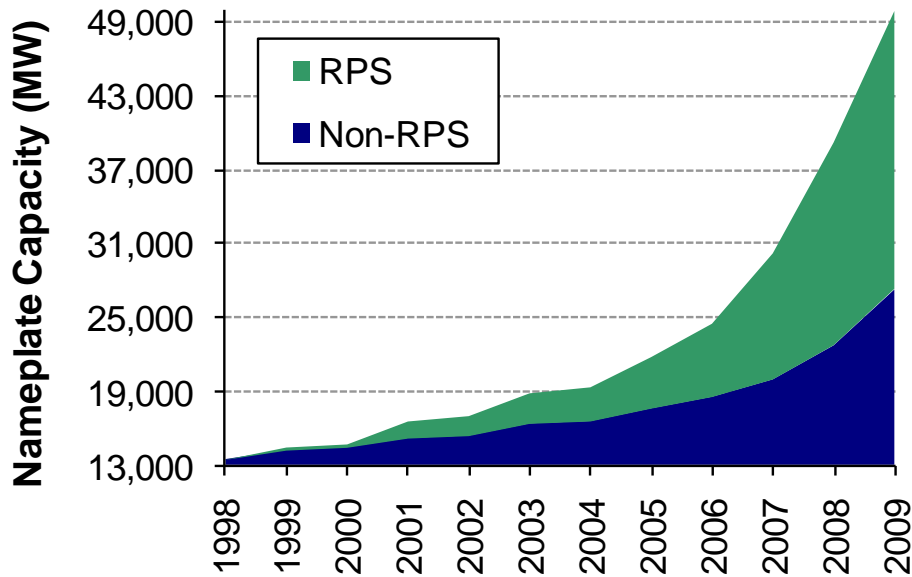
Operational Experience with State RPS Policies (years since first major compliance period)



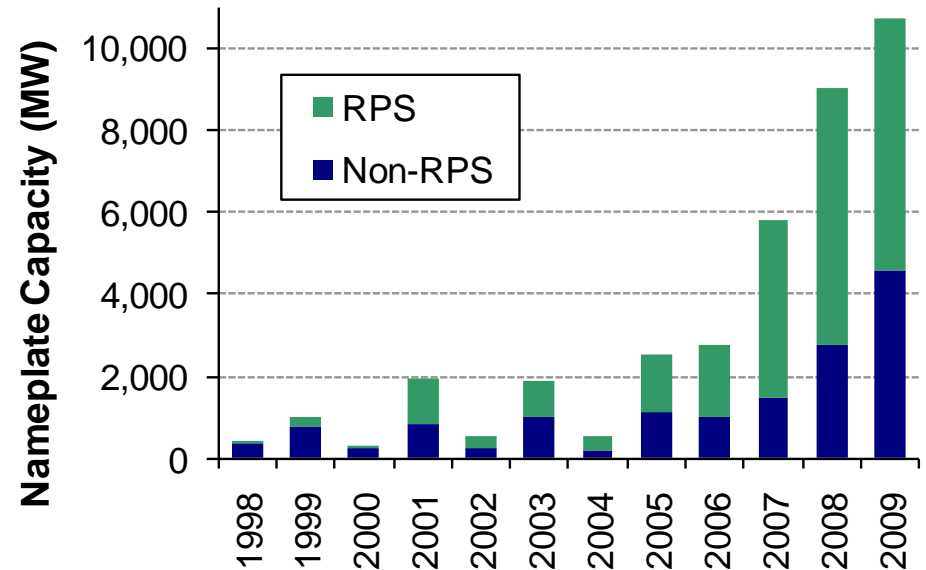
State RPS' Are Motivating Substantial Renewable Energy Development

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

Cumulative Renewable Capacity



Annual Renewable Capacity Additions

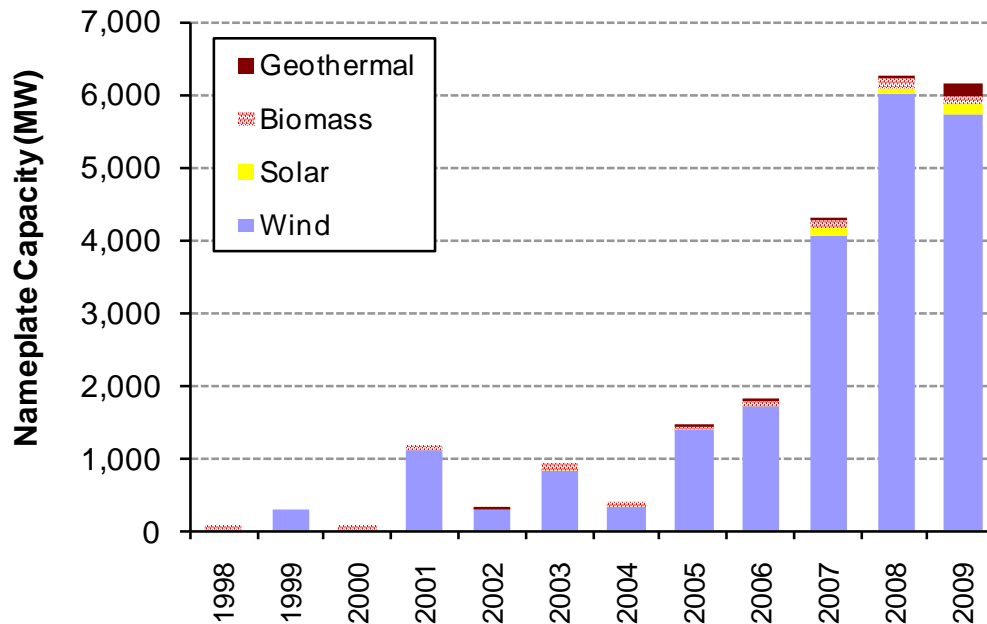


Though not an ideal metric for RPS-impact, 61% of the 37 GW of non-hydro renewable additions from 1998-2009 (**23 GW**) have occurred in states with active/impending RPS compliance obligations

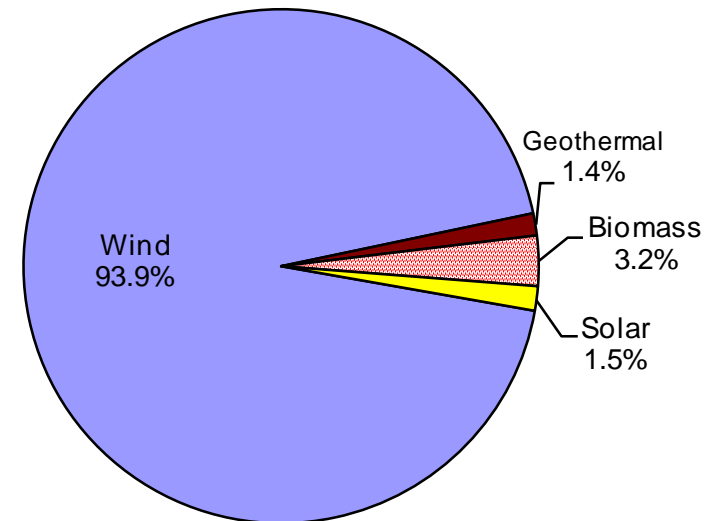
State RPS' Have Largely Supported Wind: Resource Diversity Limited So Far

RPS-Motivated* Renewable Energy Capacity Additions from 1998-2009, by Technology Type

Annual RPS-Motivated Capacity Additions

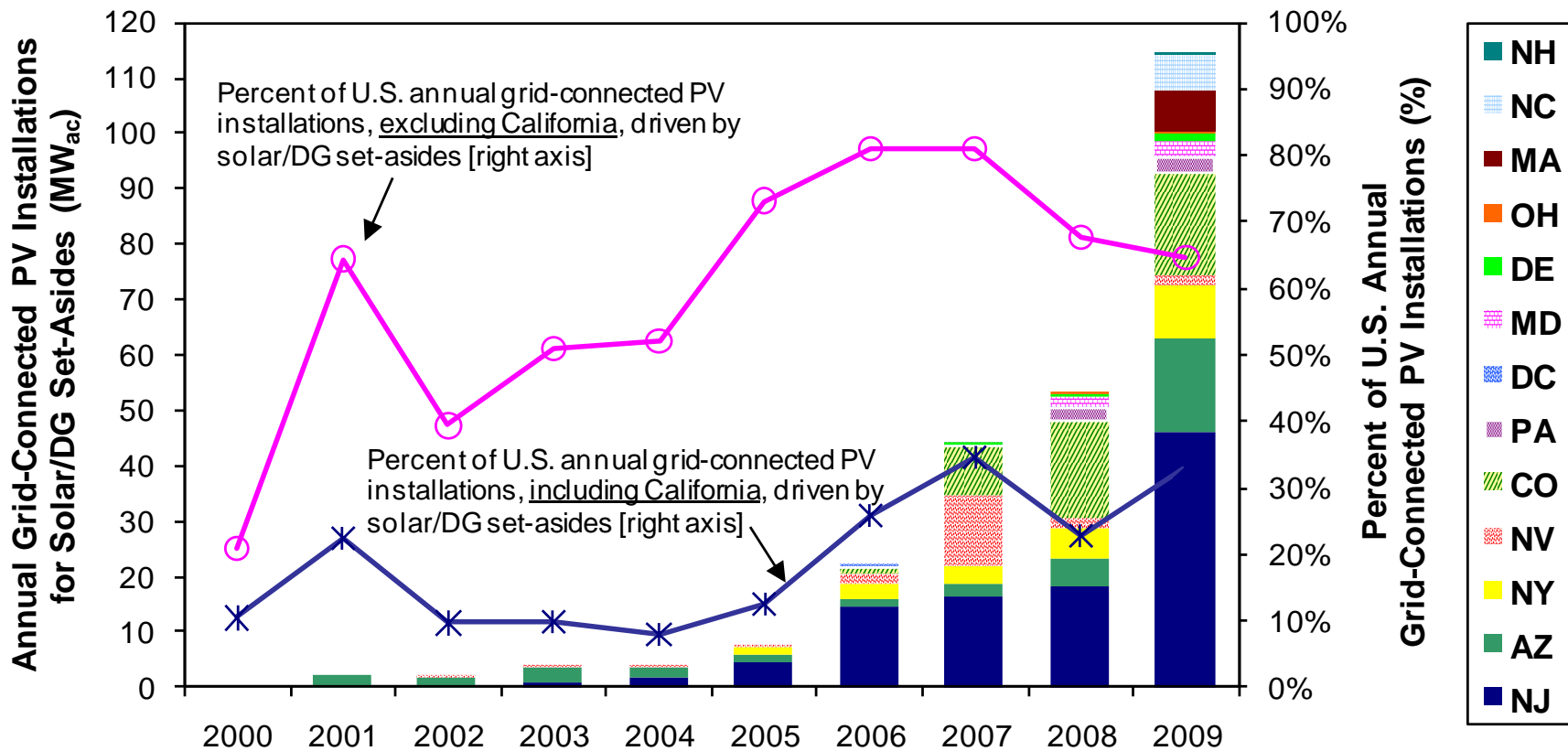


Total RPS-Motivated Capacity Additions (1998-2009)



*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 calendar year of RPS compliance obligations in the host state.

Impact of Solar/DG Set-Asides Is Growing: 253 MW_{ac} PV, 65 MW CSP from 2000-09



Set-asides also benefiting solar-thermal electric (CSP): 1 MW (Arizona) constructed in 2006, and 64 MW (Nevada) in 2007 (with many more projects planned)

Declining Solar Costs Will Increase RPS Resource Diversity Even without Set-Asides

Wind facing increased competition in California from solar; same is true elsewhere in SW and, to a lesser extent, in other regions

Increased competition largely driven by price reductions for utility-scale solar

More than 21,000 MW of contracts with new renewable generators signed in California since 2002*

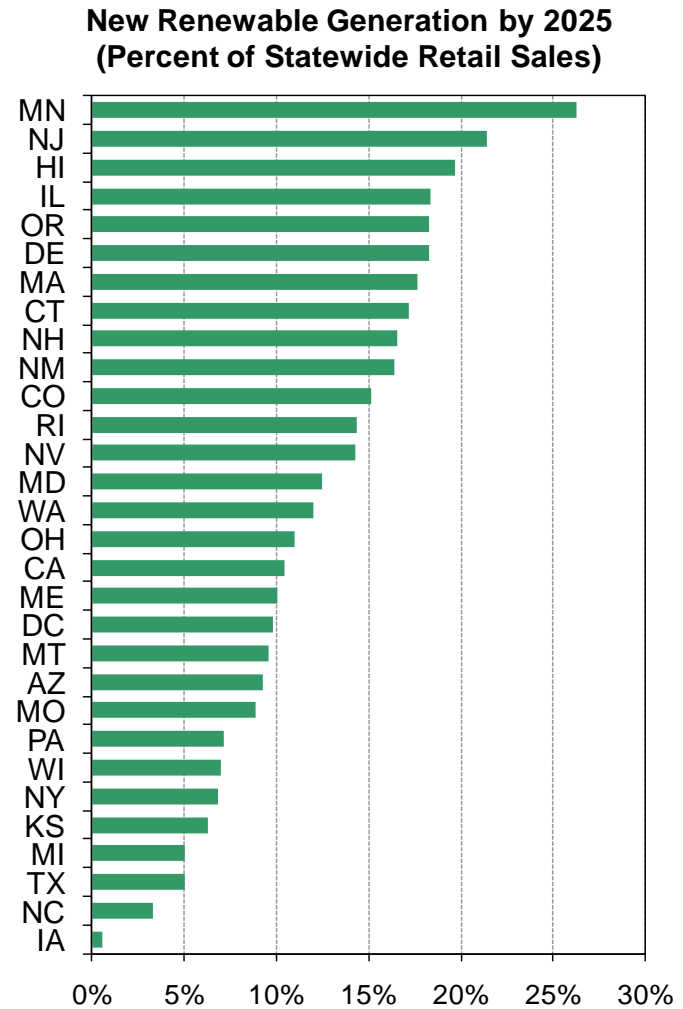
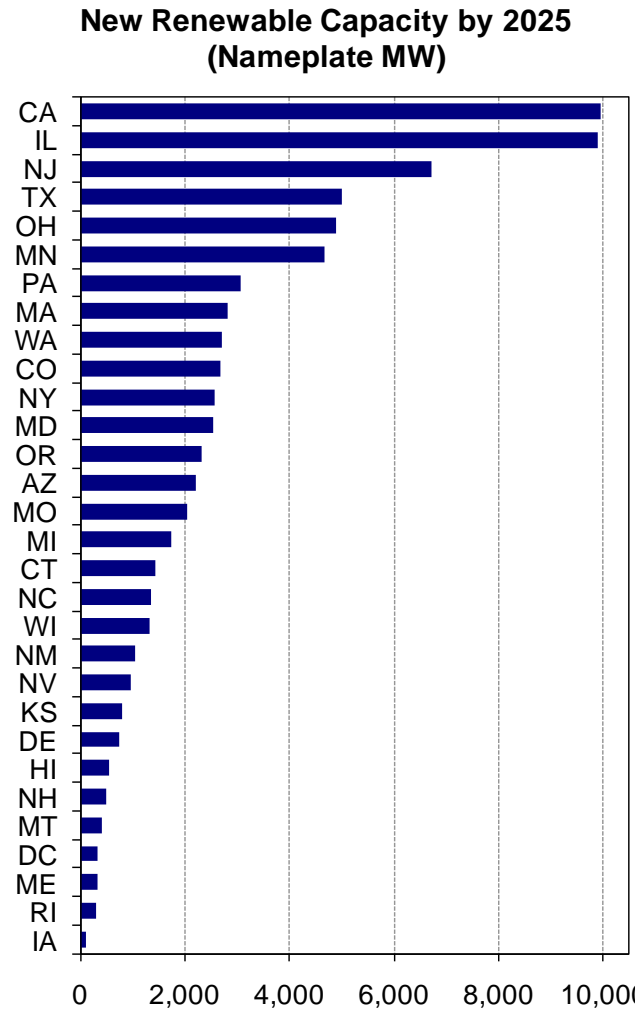
Wind	53%
Solar	41%
Geothermal	3%
Biomass/MSW	3%
Small hydro	<1%
Ocean	<1%

**Based on CPUC RPS contract database for IOUs and analysis of contract announcements by POUs*

Future Impacts of Existing RPS Policies Are Projected To Be Relatively Sizable

~76 GW of new RE* by 2025, if full compliance is achieved (97 GW including voluntary goals and 33% CA RPS)

6% of projected generation in 2025; 29% of projected load growth from 2000-2025

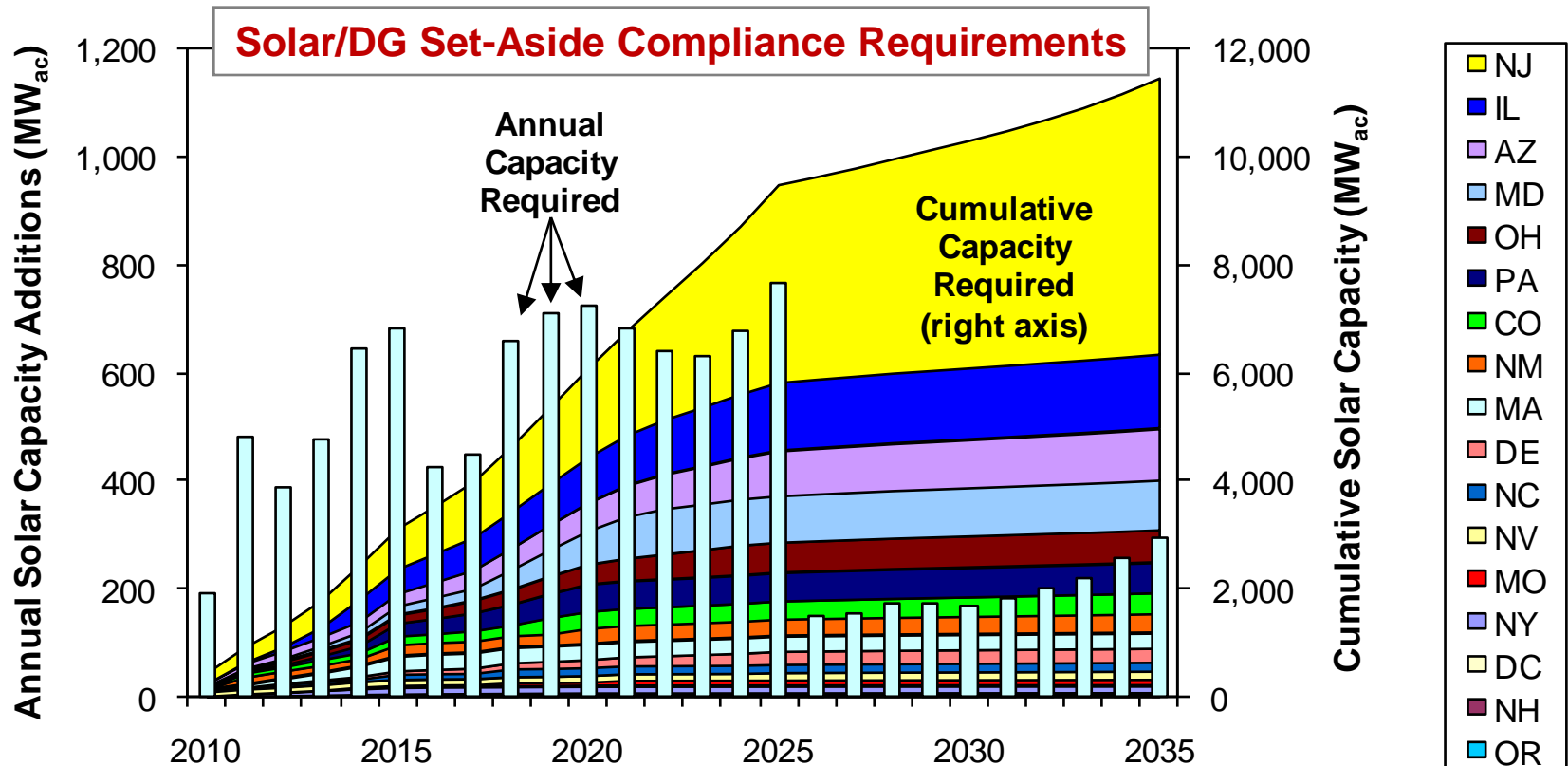


* New renewables defined based on state-specific distinctions between new vs. existing or on the year in which the RPS was enacted



Future Impacts of Solar/DG Set-Asides Are Also Projected To Be Substantial

- Cumulative capacity requirement grows to **9,500 MW by 2025**
- Required average annual solar capacity additions of **~400 MW/yr** from 2010-14, **~600 MW/yr** from 2015-25

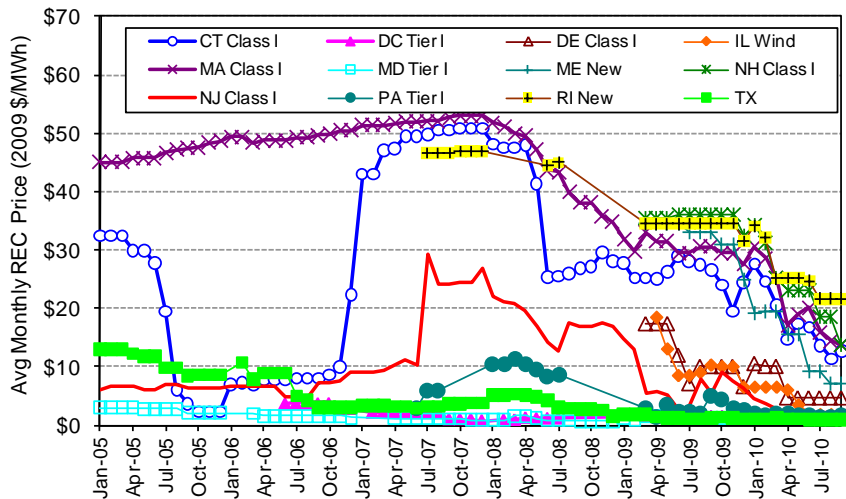


And Yet... As Always, Challenges Abound Today, and Others Are on the Horizon

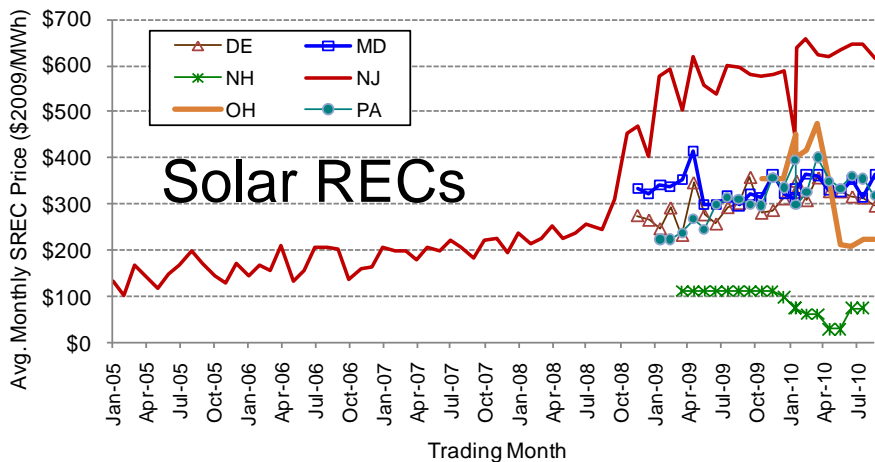
- Price trends and near-term over-supply of RE
- Required additional RE deployment is “limited”
- State RPS compliance challenges in some cases
- Other emerging state policy design issues

REC Prices Have Dropped Substantially in Many Regions Over the Last Two Years

Main Tier and Class I RECs



Sources: Evolution Markets and Spectron. Plotted values are the last trade (if available) or the mid-point of Bid and Offer prices, for the current or nearest compliance year.



Solar RECs

Sources: New Jersey Clean Energy Program (NJ), Spectron (NH), PJM-GATS (all other states). Plotted values are the weighted average selling price, except NH, where they are the mid-point of the reported Bid and Offer prices for the current or nearest compliance year.

REC price trends reflect “over-supply” of RE to meet RPS in many regions (Calif. the clear exception)

Wholesale electricity prices have also declined substantially over the same period...

Making RE development economics more challenging in near term

State RPS, and Proposed Federal RPS, Require Fewer RE Additions than Experienced in 2008-09

Recent RE capacity additions vs. RE additions required to meet current state RPS policies and proposed Federal RPS

Recent Renewable Capacity Additions (2008-2009)	9-11 GW/yr
Average Annual Renewable Capacity Additions (2010-2025)	
State RPS Requirements	3-4 GW/yr
State RPS Requirements + Voluntary Goals (inc. 33% CA)	~5 GW/yr
Proposed Federal RPS (Bingaman 2010) + State RPS	3-9 GW/yr

- ➔ **Continued growth at 2008-09 rate would far exceed level required to meet existing state RPS targets, and would be sufficient to meet the most recent Federal RPS proposal**
- ➔ **Demand from non-RPS markets (green power, IRP, least cost) may be needed to maintain 2008-09 installation rate**

Targets Largely Met with Renewable Energy or RECs, But Some Struggles Are Apparent

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

State	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
AZ	-	-	89%	64%	31%	31%	26%	25%	30%	88%
CA	-	-	-	-	-	100%	100%	98%	97%	88%
CO	-	-	-	-	-	-	-	-	100%	100%
CT	-	no data	no data	no data	no data	100%	100%	96%	100%	no data
DC	-	-	-	-	-	-	-	-	99%	100%
DE	-	-	-	-	-	-	-	-	97%	96%
HI	-	-	-	-	-	-	100%	-	-	-
IA	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
IL	-	-	-	-	-	-	-	-	-	100%
MA	-	-	-	-	100%	65%	64%	74%	99%	100%
MD	-	-	-	-	-	-	-	100%	100%	100%
ME	-	100%	100%	100%	100%	100%	100%	100%	100%	100%
MN	-	-	-	61%	72%	72%	81%	no data	99%	100%
MT	-	-	-	-	-	-	-	-	-	99%
NH	-	-	-	-	-	-	-	-	-	63%
NJ	-	-	100%	100%	100%	100%	100%	100%	100%	99%
NM	-	-	-	-	-	-	-	100%	100%	100%
NV	-	-	-	-	30%	30%	95%	39%	50%	100%
NY	-	-	-	-	-	-	-	52%	25%	24%
PA	-	-	no data	no data	-	-	-	100%	100%	88%
RI	-	-	-	-	-	-	-	-	98%	100%
TX	-	-	-	99%	96%	99%	99%	100%	99%	100%
WI	-	40%	100%	100%	100%	100%	100%	100%	88%	99%
Weighted Average	100%	98%	100%	91%	86%	94%	97%	94%	92%	90%

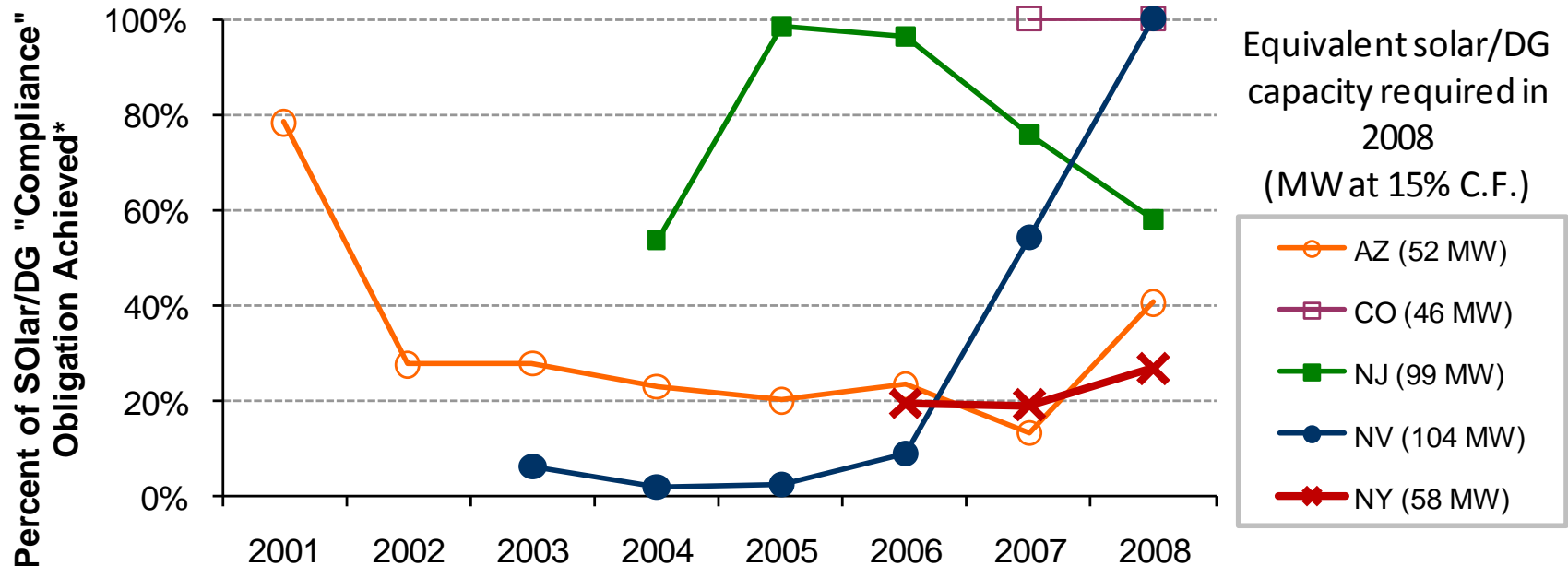
blank cells = no compliance obligation existed in that year

"no data" = compliance data unavailable for that year

States with Solar Set-Asides Not Universally Achieving their Targets with RE or RECs

Early-year retirement of solar electricity/RECs, relative to set-aside requirements, mixed: average level in 2008 = **68%**

States with Large Solar/DG Targets in 2008



Note: Percent of "Compliance" Obligation Achieved excludes ACPs but includes applicable credit multipliers. In cases where this figure is below 100%, suppliers may not have been technically out of compliance due to solar ACP compliance options, funding limits, and force majeure provisions.

Emerging Issues Facing RPS Programs: State Policy Design

- Long-term contracting needs in “restructured” markets otherwise dominated by short-term REC transactions
- Addressing the dual desires for liquid RE markets *and* in-state benefits in the face of the Commerce Clause
- Managing compliance enforcement procedures, force majeure events, and cost caps as targets become binding
- Maintaining some stability and predictability in the face of numerous ongoing policy design changes
- Interactions between state and possible Federal RPS’
- Addressing the other barriers to renewable energy: transmission, integration, siting, etc.