NARUC 122nd Annual Meeting
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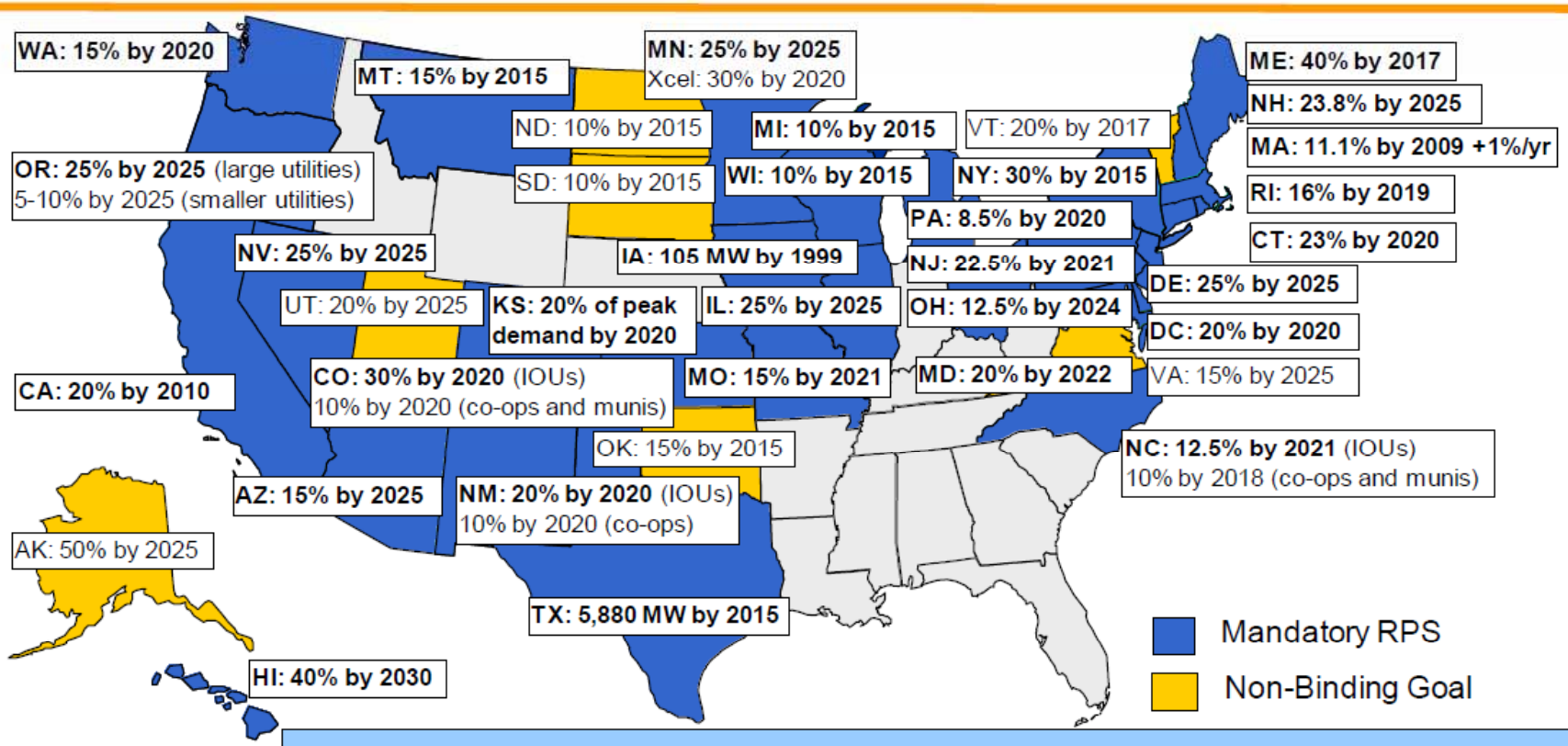
The Status of State RPS Efforts

- Trends and Challenges -

Mark Sinclair
Clean Energy States Alliance

State RPS Policies: 29 States and D.C.
(7 More States Have Non-Binding Goals)



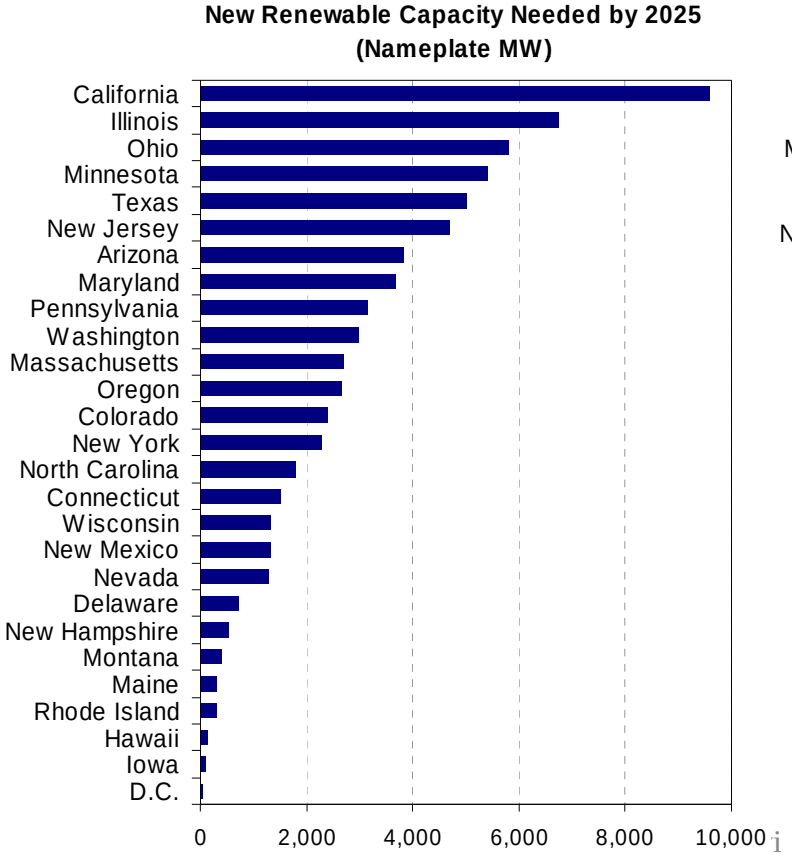
Source: Berkeley Lab

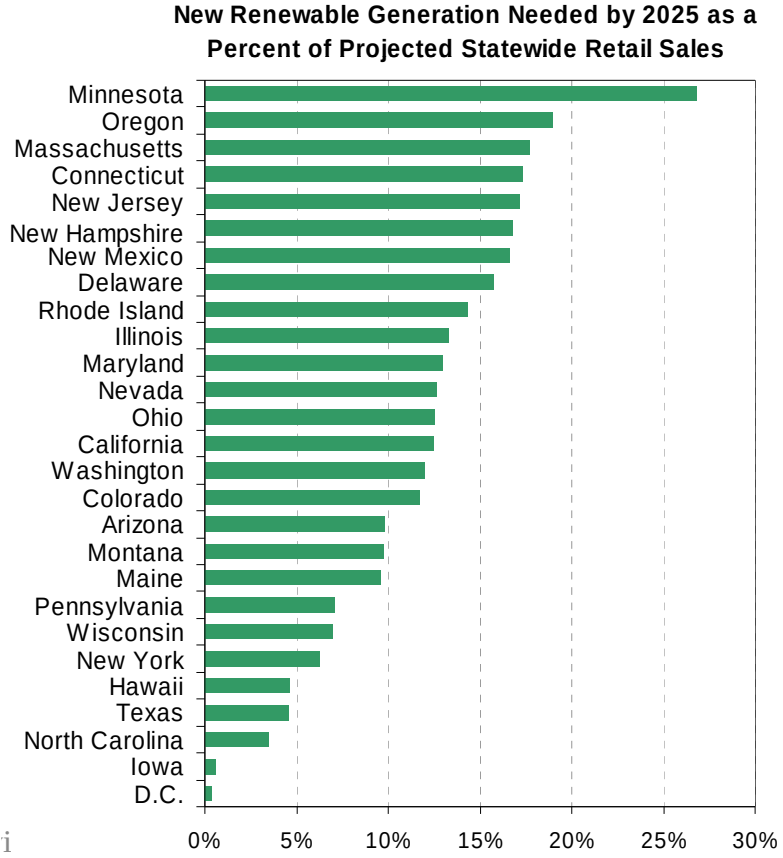
Existing RPS policies will apply to **56%** of U.S. electricity demand once fully implemented; require **73 GW** of new RE capacity by 2025

Of the 37 GW of RE capacity added from 98-09, **23 GW** occurred in states with active or impending RPS compliance obligations

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

- Roughly 73 GW of new renewables capacity by 2025, if full compliance is achieved (increases to 88 GW including all non-binding renewable targets)
- The 73 GW would represent ~5.5% of total U.S. generation in 2025
- 18% of projected load growth from 2000-2025 met by this new generation





Trends Among Recently Established or Revised RPS Programs

- Increased stringency of RPS renewable energy purchase targets
- Expanded use of resource-specific set-asides, especially for solar power
- Expanded applicability of RPS policies to publicly owned utilities

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State RPS Policies Feature Significant Design Differences

- Renewable purchase targets and timeframes
- Eligibility of different renewable technologies
- Whether existing renewable projects qualify
- Treatment of out-of-state generators
- Whether tech. 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
- Compliance filing and approval requirements
- Compliance cost recovery
- Role of state funding mechanisms

Geographic Eligibility and Electricity Delivery Rules Vary Considerably

Rules for geographic eligibility and electricity delivery vary greatly

Variation reflects differing:

- state interests in supporting in-state or in-region RE
- interpretations of the requirements imposed by the Interstate Commerce Clause
- wholesale market structure and geography

Geographic Eligibility and Delivery Requirements	States	Notes
In-state generation requirement	HI, IA	IA: also allows location in broader utility service area
In-region generation requirement	MN, OR, PA	MN: RECs originating within M-RETS; OR: WECC for unbundled RECs, U.S. portion of WECC and delivered to LSE for renewable electricity; PA: PJM projects for all LSEs, MISO projects for some LSEs
Electricity delivery required to state or to LSE		
Direct transmission inter-tie between generators and state	NV, TX	NV: allows limited sharing of transmission inter-tie with other generators; TX disallows such sharing
Broader delivery requirements to state or to LSE	AZ, CA, MT, NM, NY, OH, WI	CA: relaxed scheduling allows shaped/firmed products; NY: strict hourly scheduling to state and strong preference for in-state resources in solicitation process; WI: projects must be owned by or under contract to LSE
Electricity delivery required to broader region		
Generators anywhere outside region must deliver electricity to region	DE, ME, NJ, WA	DE: also provides credit multipliers for in-state wind installed before 2013; NJ: resources outside PJM must be "new"; WA: if outside Pacific Northwest, requires delivery to state
Generators in limited areas outside region must deliver electricity to region	CT, DC, MA, MD, NH, RI	All: renewable facilities must be located in control areas adjacent to state's ISO; DC: LSEs may also purchase unbundled RECs (without electricity delivery) from states that are adjacent to PJM
In-state generation encouragement		
In-state multipliers	CO	No restriction on location of RECs creation, but credit multiplier for in-state projects (DE also provides in-state encouragement through multipliers)
Cost-effectiveness test	IL	In-state unless insufficient cost-effective resources, then from adjoining states, then from other regions; after 2011, equal preference to in-state and adjoining states
Limit on RECs from out-of-state generators	NC	Up to 25% compliance can be met with unbundled RECs from outside state (no limit for one LSE, Dominion); remainder must be in-state or delivered to LSE

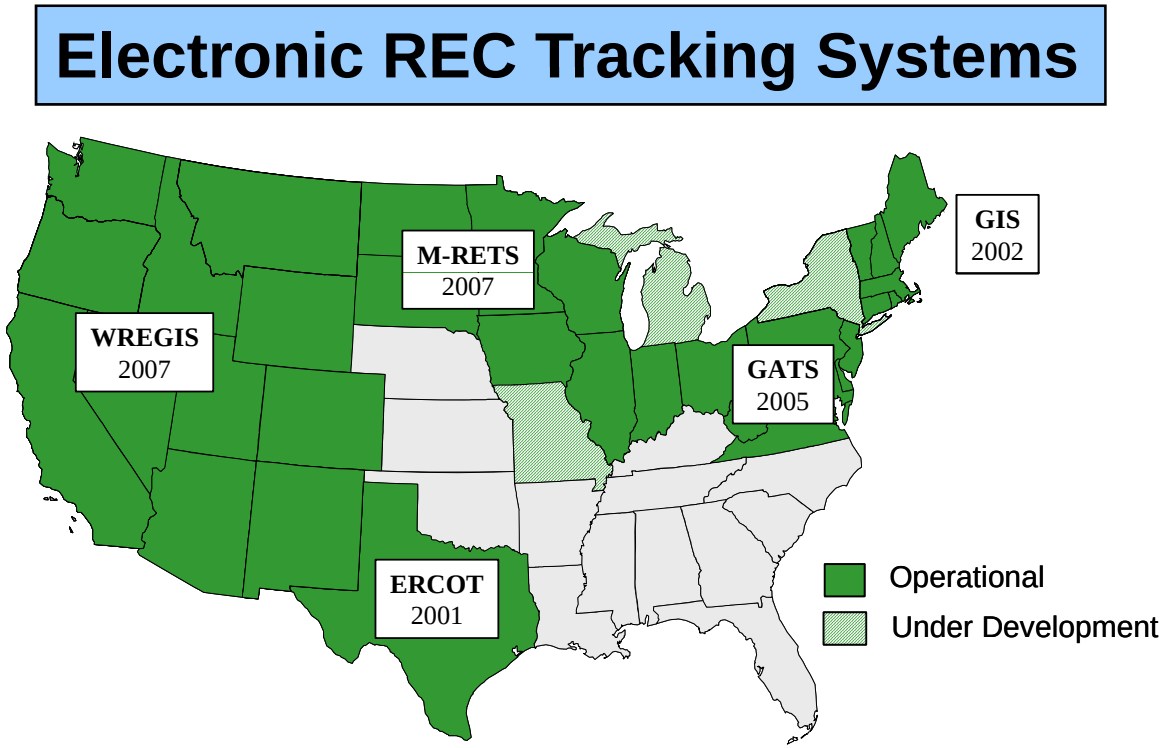
The Use of Renewable Energy Certificates and Certificate Tracking Systems Expand

Electronic REC tracking systems are prevalent

Most state RPS policies now allow unbundled RECs (often with some restrictions)

Exceptions are Arizona, California, Hawaii, and Iowa

REC definitions are not uniform across states



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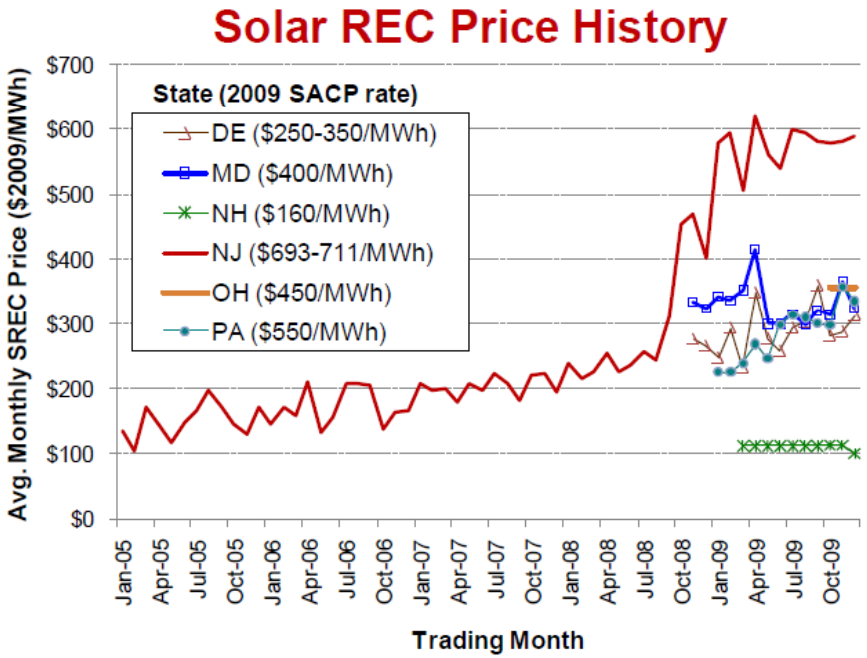
Contracting-Related Challenges Persist

- **Uncertain and Fragmented REC Markets:** lack of liquidity/transparency/ price certainty creates financing challenges
- **Incomplete Contracting/ Incentive Policies:** especially of concern in states with retail competition, and for smaller solar systems



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.

A Number of States Have Encouraged Longer-Term Contracting

Renewable projects are capital intensive, and concerns about the challenges of project financing with REC price variability has spurred some states to adopt provisions to help projects secure financing

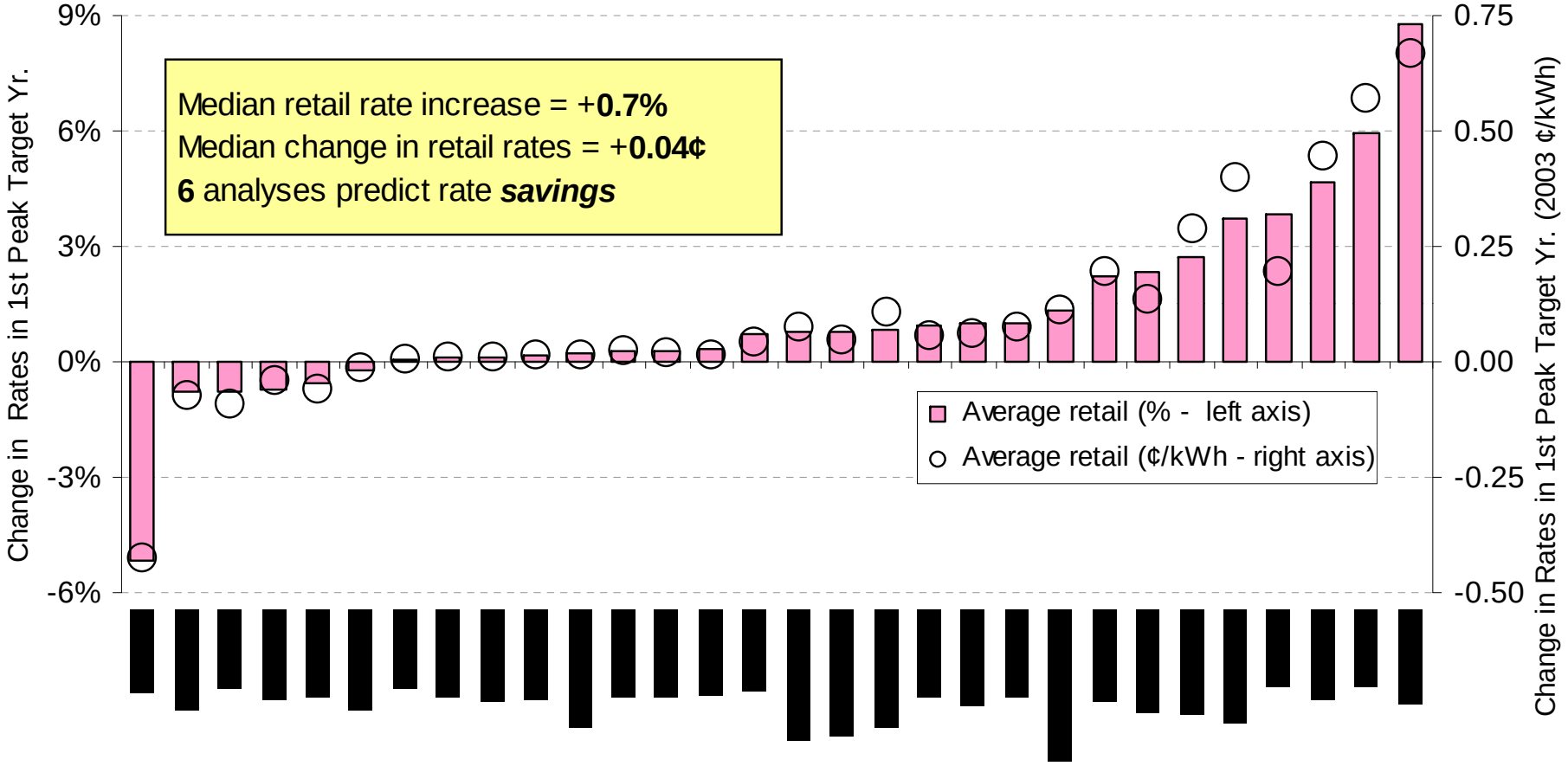
Contract Duration Requirement	CA	10+ years
	CO	20+ years
	CT	100 MW, 10+ years
	IA	Ownership or long-term contract
	MD	Solar, 15+ years
	MA	10-15 years, if reasonable proposals
	MT	10+ years
	NV	10+ years
	NC	Solar, Sufficient length to stimulate development
	PA	Good faith effort includes seeking long-term contracts
	RI	PUC requires that default utility investigate long-term contracting
Central Procurement	NY	Central procurement where NYSERDA purchases attributes under long-term contract
	IL	Central procurement in which long-term contracts are likely to be offered

Given Uncertainty in Future Costs, Cost Caps of Various Designs Are Common

1. **Alternative compliance payment (with automatic cost recovery):** MA, ME, NH, NJ, RI
2. **Alternative compliance payment (with possible cost recovery):** DE, MD, OR, DC
3. **Retail rate / revenue requirement cap:** CO, IL, MD, NM, OH, OR, WA
4. **Renewable energy contract price cap:** HI, MT, NM
5. **Per-customer cost cap:** AZ, NC, NM
6. **Renewable energy fund cap:** AZ, CA, NY
7. **Financial penalty may serve as cost cap:** CT, OH, PA, TX

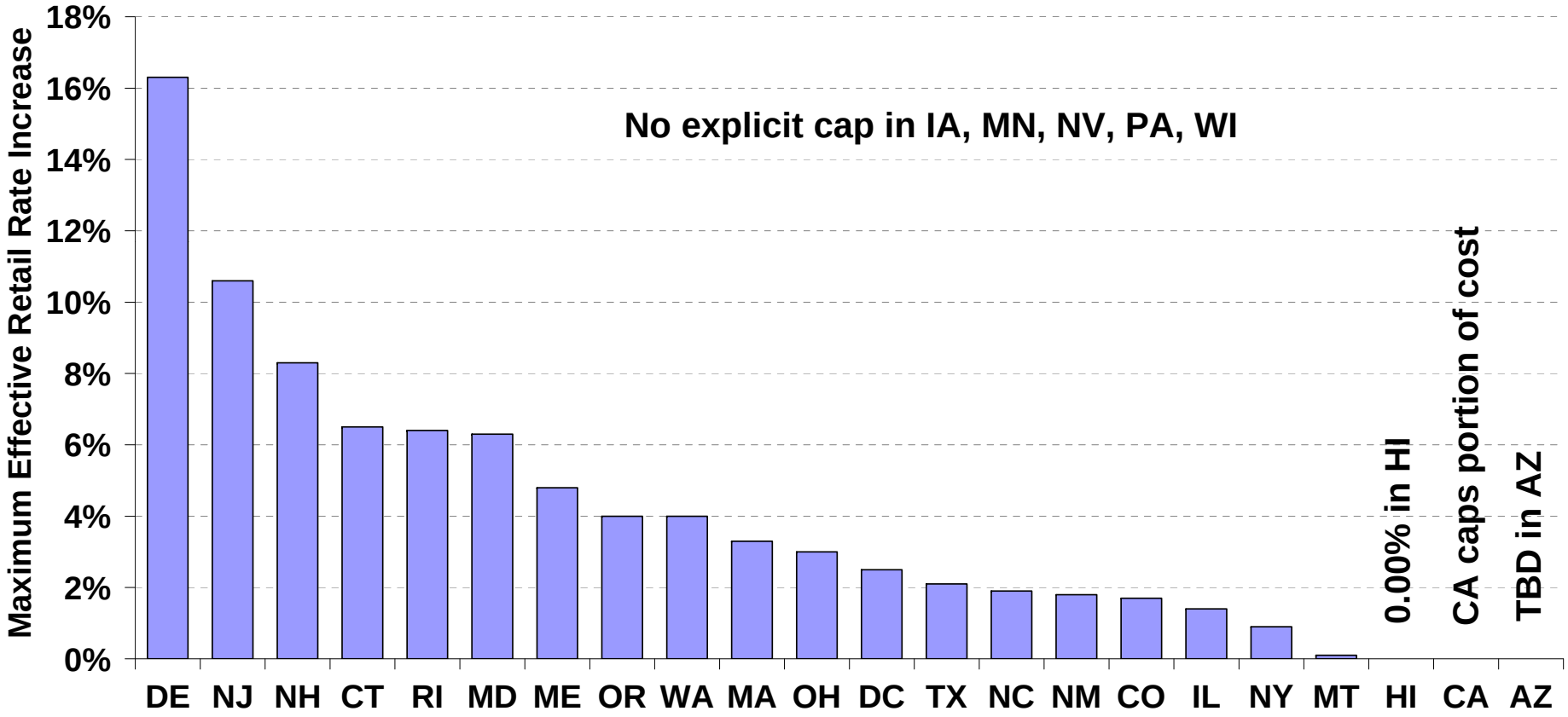
Cost Concerns:

21 of 30 State RPS Analyses Predict Rate Increases of Less Than or Equal to 1%



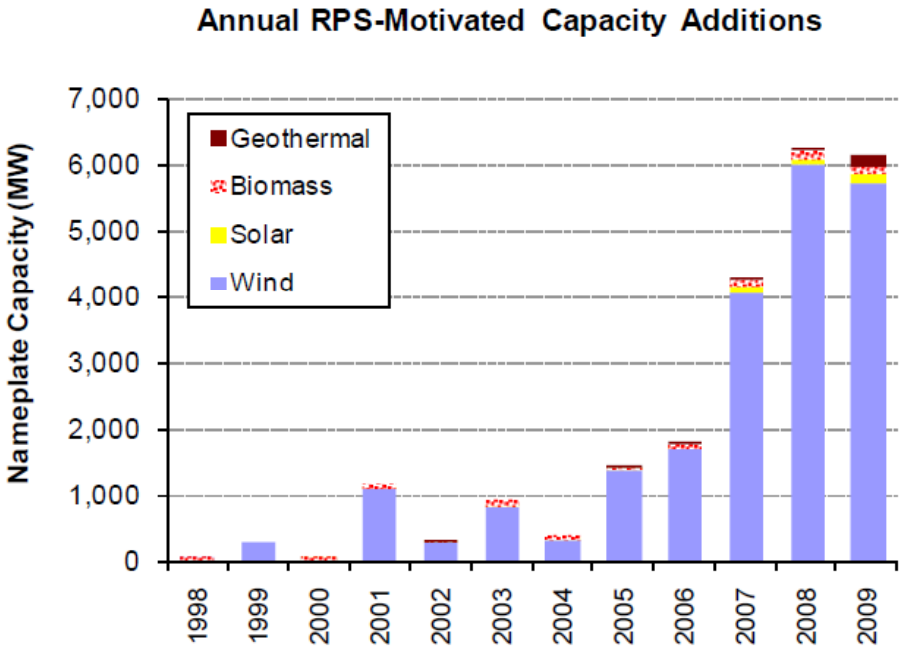
Source: http://eetd.lbl.gov/ea/ems/reports/61580.pdf

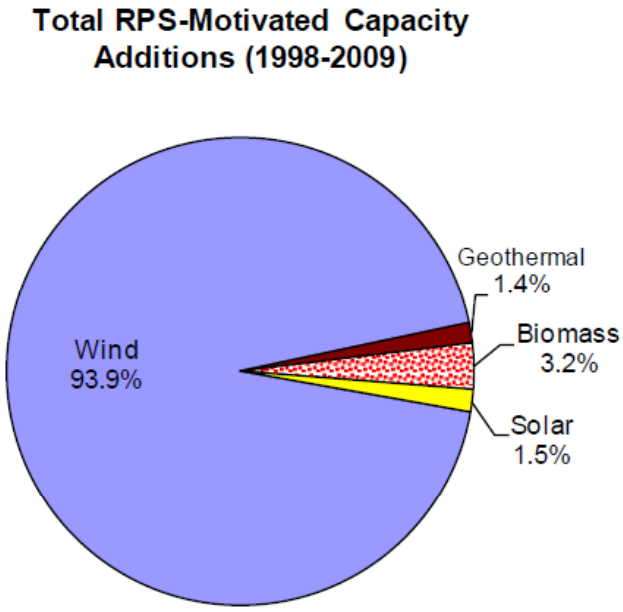
Most States Have Capped Rate Impacts Well Below 10% (13 States Below 4%)



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

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





**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.*

Why Have We Seen So Little Renewable Resource Diversity Under State RPS?

- **By design, most RPS policies originally designed to be technology-neutral, stimulating competition among all eligible resources**

- **RPS programs of this design are not likely to provide much impetus for more-costly technologies, or for smaller projects:**
  - Cost barriers: only the lowest-cost technologies can compete effectively
  - Solicitation barriers: smaller projects not always able to easily participate in competitive solicitations

- **10 of 30 state RPS policies provide no differential support for solar/distributed energy; experience shows that:**
  - These RPS policies are unlikely to provide meaningful support to customer-sited PV in the near term
  - With the exception of the Southwest, these policies are unlikely to greatly benefit utility-scale solar (PV and CSP) in the very near term
  - But… with solar costs declining, some of these "facts" may change

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RPS Policies Are Increasingly Being Designed to Support Resource Diversity

Set Asides: A requirement that some portion of the RPS come from certain technologies, technology types, or applications

Credit Multipliers: Provides selected technologies or applications more credit than other forms of generation towards meeting the RPS

Set-Asides			Credit Multipliers
General Technology	**Specific Technology**	**Specific Application**	
Class I vs. II: CT, DC, MA, MD, ME, NJ	Solar Energy: DC, DE, IL, MA, MD, MO, NC, NH, NJ, NM, NV, OH, OR, PA Wind Energy: IL, ME (goal), MN, NJ (offshore), NM Existing Biomass/Methane: NH Existing Hydropower: NH Geothermal or Biomass: NM Swine Waste: NC Poultry Waste: NC Non-Wind: TX (goal)	Distributed Generation: AZ, CO, NM, NY Community Ownership: MN (goal), MT (wind), OR (goal, community and small scale)	Solar Energy: DE (general RPS), MI, CO (POUs), NV (PV), OR Wind Energy: DC, MD, DE (offshore) Methane: DC, MD Fuel Cells: DE Waste Tires: NV Non-Wind: TX Distributed Generation: NV (PV), WA Community Ownership: CO, ME

No differential support CA, IA, KS, WI

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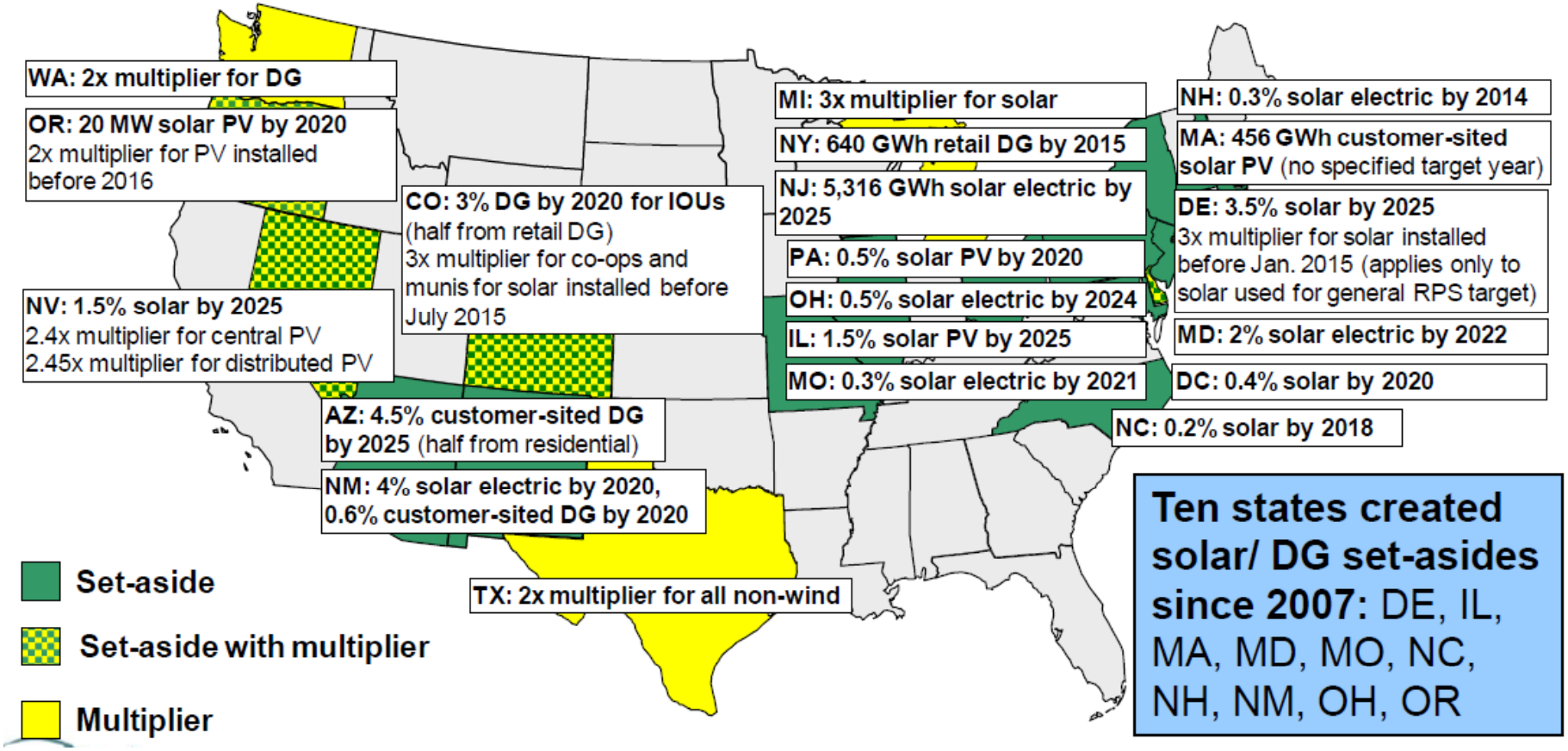
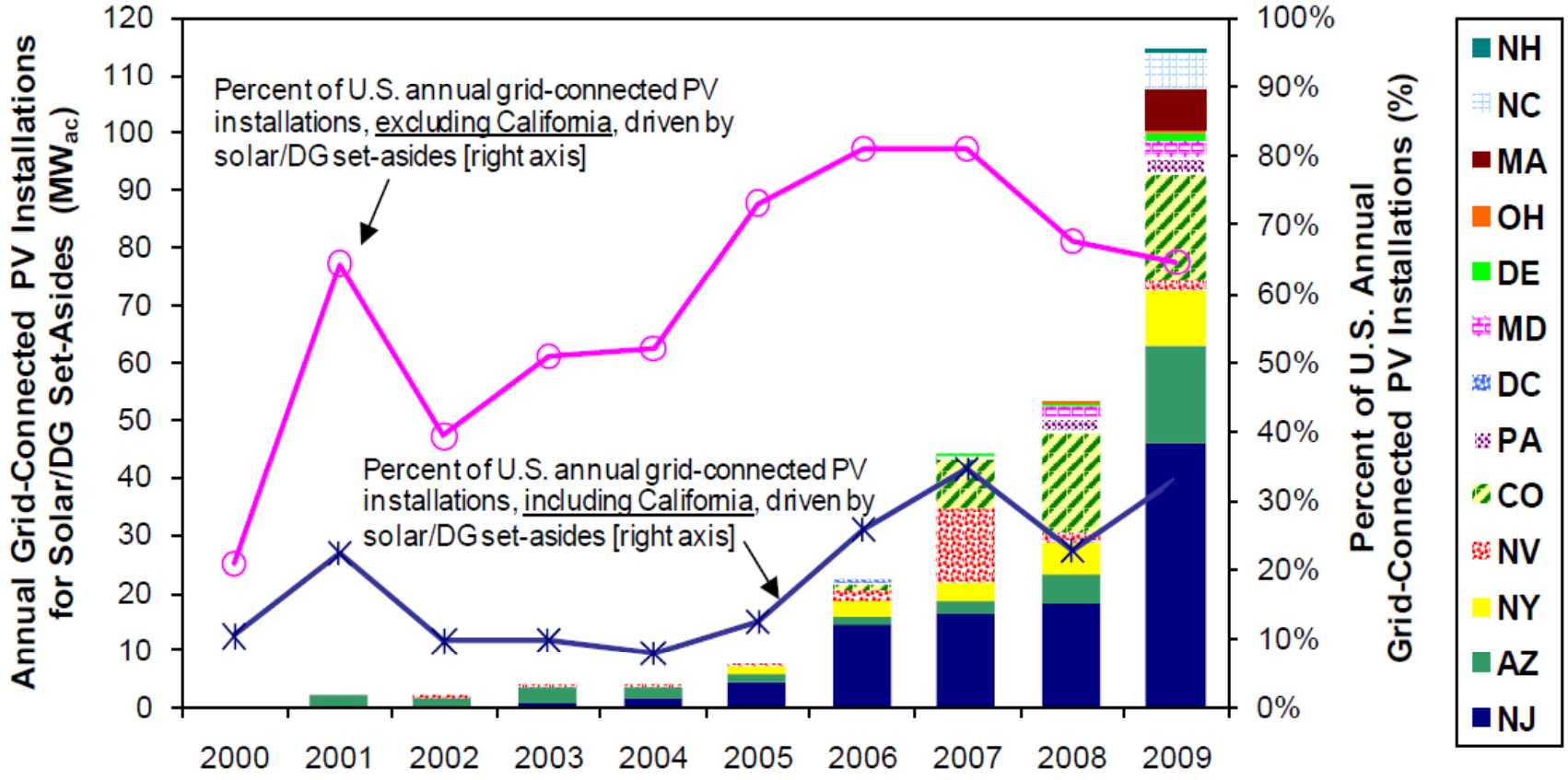
Solar/DG-Specific RPS Designs Becoming Common Nationwide

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



Ten states created solar/ DG set-asides since 2007: DE, IL, MA, MD, MO, NC, NH, NM, OH, OR

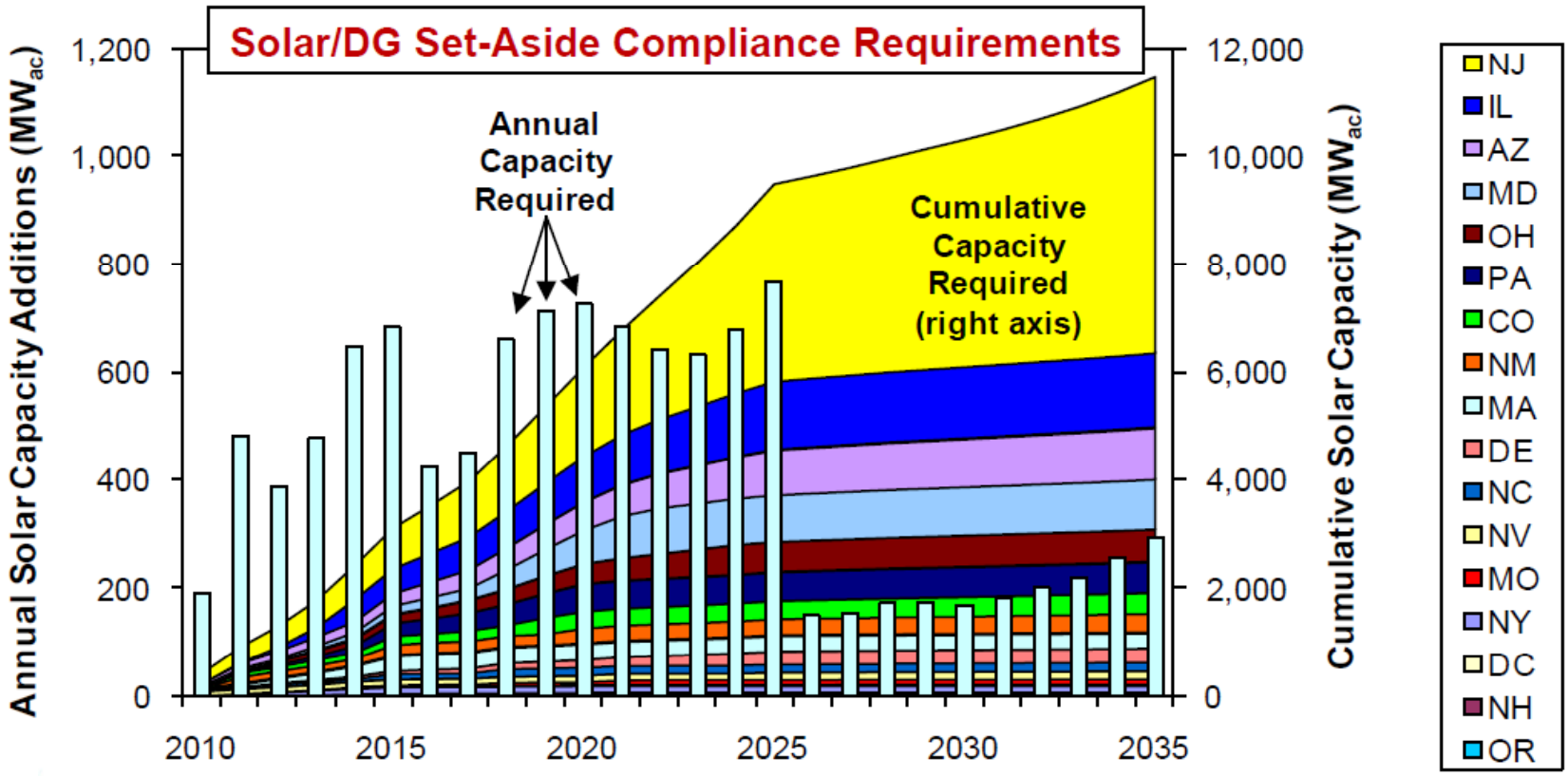
Impact of Solar/DG Set-Asides Is Growing: 253 Mw_{ac} of PV from 2000-2009



** PV additions are counted as being motivated by a solar/DG set-aside if and only if they are located in a state with an solar/DG set-aside policy and installation occurred no more than one year before the first calendar year of set-aside compliance obligations in the host state. The only exception is the 10 MWac El Dorado PV project installed in Nevada in 2008; the electricity generated by this project is being sold into California, and therefore is not attributed to Nevada's set-aside. Data on annual state PV capacity provided by Larry Sherwood (IREC).*

Solar/DG Set-Asides Will Require Substantial Growth in Solar Capacity

- 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



Emerging Issues Will Influence Future Impacts of RPS Policies on Solar Growth

- Utility-scale solar appears competitive against other renewables in the Southwest
- Full compliance with set-asides has not been achieved in many markets
  - Uncertain and fragmented solar REC markets
  - Incomplete contracting/incentive policies
- Cost caps/funding limits may become binding
- Fate of in-state geographic requirements unclear under the interstate commerce clause

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Emerging Issues Facing RPS Programs

Growing Demand for Renewable Electricity

- Stringency of RPS targets are on the rise
- Greater use of resource-specific set-asides, especially for solar

Emerging Barriers To Address

- Rising costs of renewable energy (wind, biomass, geothermal)
- Uncertainty of federal tax incentives
- Restricted capital markets and availability of finance
- Need for dramatic increases in transmission infrastructure and removal of siting constraints
- Deal with the risk of contract failure, especially for emerging technologies

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Emerging Issues Facing RPS Programs

- Developing regional markets for renewable energy as renewable energy demands grow
- Long-term contracting needs especially for solar resources, and in the midst of the financial crisis
- Maintaining some stability and predictability in the face of numerous design changes
- Interactions between state RPS programs and possible Federal RES

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Conclusions

- The popularity of RPS policies has grown, RPS' are already a major driver of renewable energy, and the importance of these programs is expected to build over the coming decade
- Designing an effective RPS is not easy, and varying state experiences highlight the importance of design details
- RPS programs do not operate in isolation: transmission and permitting policies, as well as federal tax incentives, play major roles in program effectiveness
- A host of emerging challenges will need to be overcome if state RPS success is to be achieved

Contact Info

Mark Sinclair
Executive Director
Clean Energy States Alliance
MSinclair@cleanegroup.org

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- Ed Holt, Ed Holt Associates for solar RPS provision analysis

Requirements for In-State Generation Are Coming Under Constitutional Fire

The constitutionality of RPS "in-state generation" requirements has long been an open question. Until recently, no party has felt sufficiently aggrieved to issue a challenge.

- On April 16, 2020, TransCanada filed suit against Massachusetts in U.S. District Court, alleging that the solar set-aside "in-state generation" requirement violates the Interstate Commerce Clause
- TransCanada is a competitive retail supplier in MA and claimed that the requirement forces it to pay higher prices for solar RECs and/or solar ACPs
- MA and TransCanada have since settled this issue without requiring a change to the "in-state" provision of the solar set-aside
- It remains to be seen whether this is a harbinger of similar legal challenges to come

Proposed Federal Renewable Energy Standard

- Spring 2009: Senate Energy Committee (ACELA)
- Summer 2009: House (ACES)
- September 2010: REPA introduced in Senate
- Lame duck session: ??

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Key Provisions of Renewable Energy Promotion Act of 2010 (Bingaman RES)

- 15% by 2021
- 26.67% EE compliance
- Small utility exemption
- Baseline exclusion for large hydro, new nuclear, and CCS
- National credit trading with separate federal REC
- ACP: 2.1 cents/kwh & inflation
- 4% rate impact cap
- State savings clause

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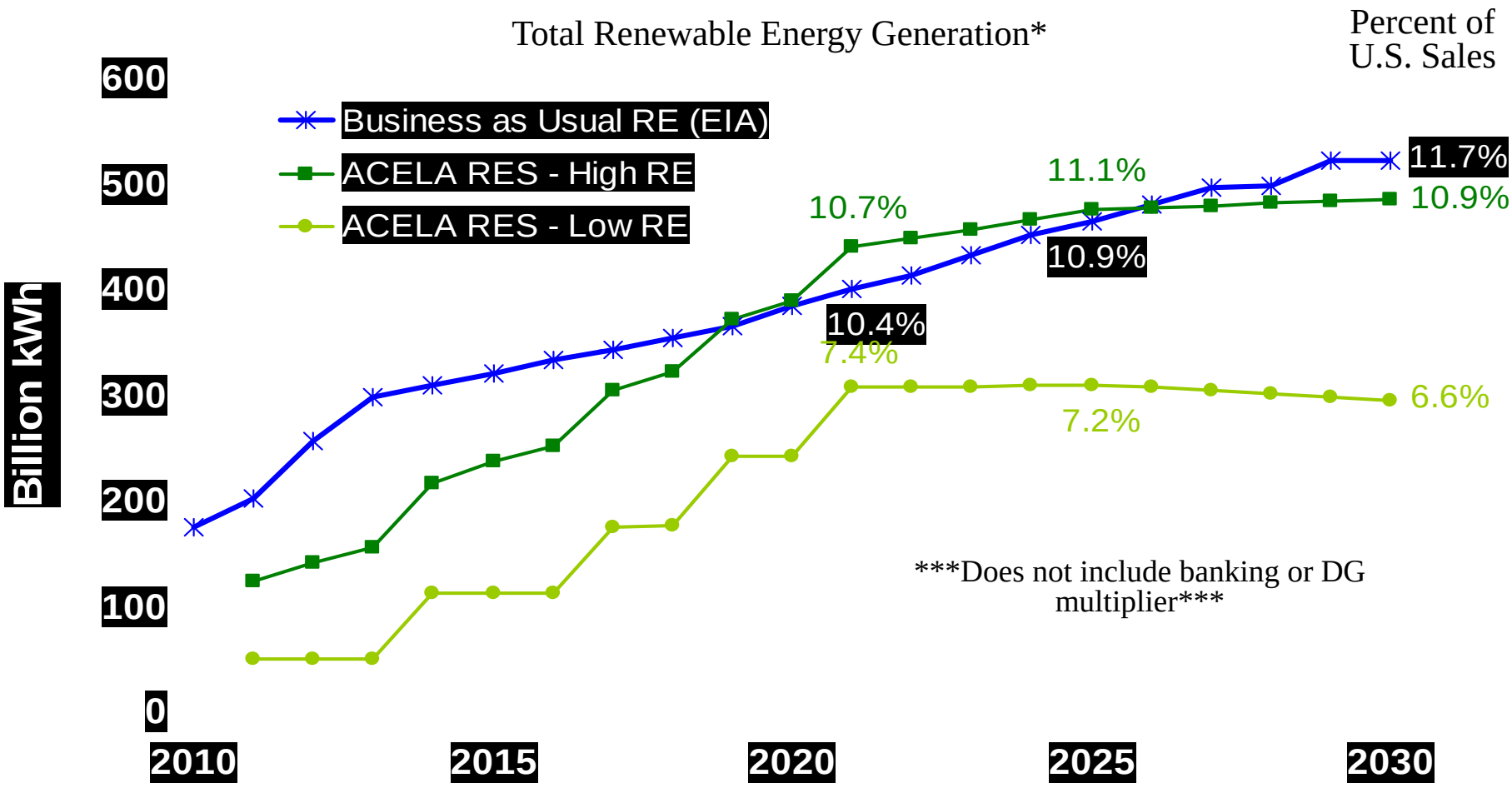
Federal-State RES Interaction Issues

- Dual REC system
- Surplus federal RECs
- Federal RECs issued for state RES ACP payments
- RE funds from ACPs administered by states: allocation

ACELA RES - Comparison with BAU



High RE Case: 30 states opt into EE + states do not allow trading of RE credits from higher state standards to other states for federal RES compliance.

Low RE Case: All states opt into EE, + states do allow trading of RE credits from higher state standards.

*In addition to hydro & MSW. Sources: EIA (AEO 2010, STEO), UCS.

Source: Jeff Deyette, UCS