Energy Technologies Area Lawrence Berkeley National Laboratory

U.S. Renewable Portfolio Standards

2018 Annual Status Report

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Download at: *rps.lbl.gov*

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Acronyms

ACP: Alternative compliance payment
DG: Distributed generation
EIA: Energy Information Administration
GW: Gigawatt
GWh: Gigawatt-hour
IOU: Investor-owned utility
LSE: Load-serving entity
MSW: Municipal solid waste
MW: Megawatt
MWh: Megawatt-hour
NEPOOL: New England Power Pool
PPA: Power purchase agreement
PUC: Public utilities commission
RE: Renewable electricity
REC: Renewable electricity certificate
RPS: Renewables portfolio standard
SACP: Solar alternative compliance payment
SREC: Solar renewable electricity certificate
TWh: Terawatt-hour

Highlights

Evolution of state RPS programs: Significant RPS-related policy revisions in 2018 include increased RPS targets in CA, CT, MA, and NJ; a phase-out of NJ's solar carve-out; a clean peak standard in MA; and new or increased offshore wind carve-outs in NJ and NY.

Historical impacts on renewables development: Roughly half of all growth in U.S. renewable electricity (RE) generation and capacity since 2000 is associated with state RPS requirements. Nationally, the role of RPS policies has diminished over time, representing 34% of all U.S. RE capacity additions in 2017. However, within particular regions—namely, the Northeast, Mid-Atlantic, and West—RPS policies continue to play a central role in supporting RE growth.

Future RPS demand and incremental needs: Meeting RPS demand growth will require roughly a 50% increase in U.S. RE generation by 2030, equating to 56 GW of new RE capacity. To meet future RPS demand, total U.S. RE generation will need to reach 15% of electricity sales by 2030 (compared to 11% today), though other drivers will also continue to influence RE growth.

RPS target achievement to-date: States have generally met their interim RPS targets in recent years, with only a few exceptions reflecting unique, state-specific policy designs.

REC pricing trends: Prices for NEPOOL Class I RECs continued to fall in 2018, as surplus RPS supplies grew, while PJM Tier I REC prices began to rebound. Price trends for solar RECs vary by state, though no major shifts occurred in 2018.

RPS compliance costs and cost caps: RPS compliance costs totaled $4.1 billion in 2017, which equates to 2.0% of average retail electricity bills in RPS states. Though total U.S. RPS compliance costs rose from 2016, recent trends show that falling RE costs and REC prices have helped to offset the upward pressure on compliance costs from rising RPS targets.

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What is a Renewables Portfolio Standard (RPS)?

aka renewable energy standard (RES), alternative energy standard (AES), etc.

Renewables Portfolio Standard

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 certificate (REC) program to facilitate compliance
Never	Designed the same in any two states

This report covers U.S. state RPS policies. It does <u>not</u> cover:

– Voluntary renewable electricity goals
– Broader clean energy requirements without a renewables-specific component
– RPS policies outside of the United States or in U.S. territories

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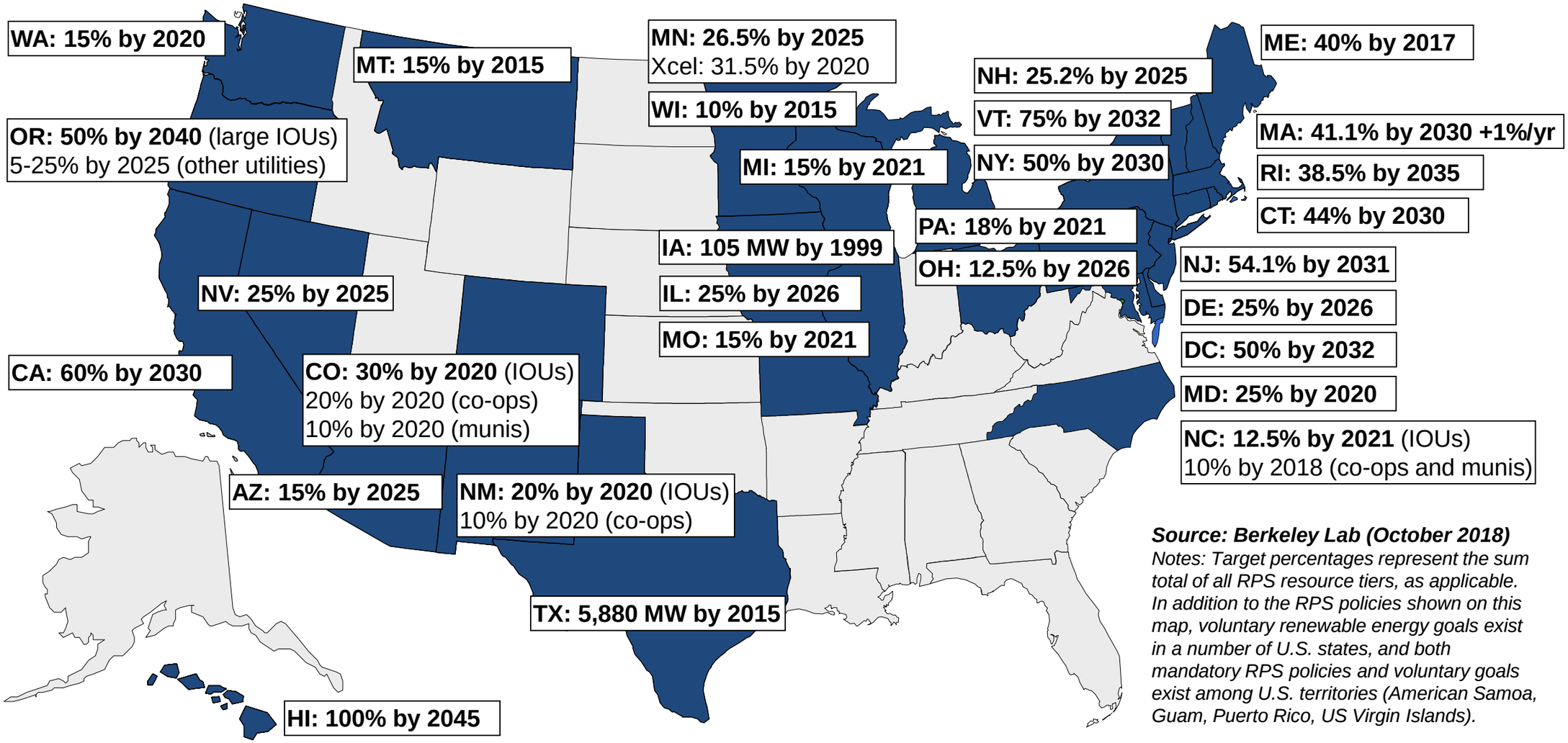
RPS Policies Exist in 29 States and DC

Apply to 55% of Total U.S. Retail Electricity Sales



Source: Berkeley Lab (October 2018)

Notes: Target percentages represent the sum total of all RPS resource tiers, as applicable. In addition to the RPS policies shown on this map, voluntary renewable energy goals exist in a number of U.S. states, and both mandatory RPS policies and voluntary goals exist among U.S. territories (American Samoa, Guam, Puerto Rico, US Virgin Islands).

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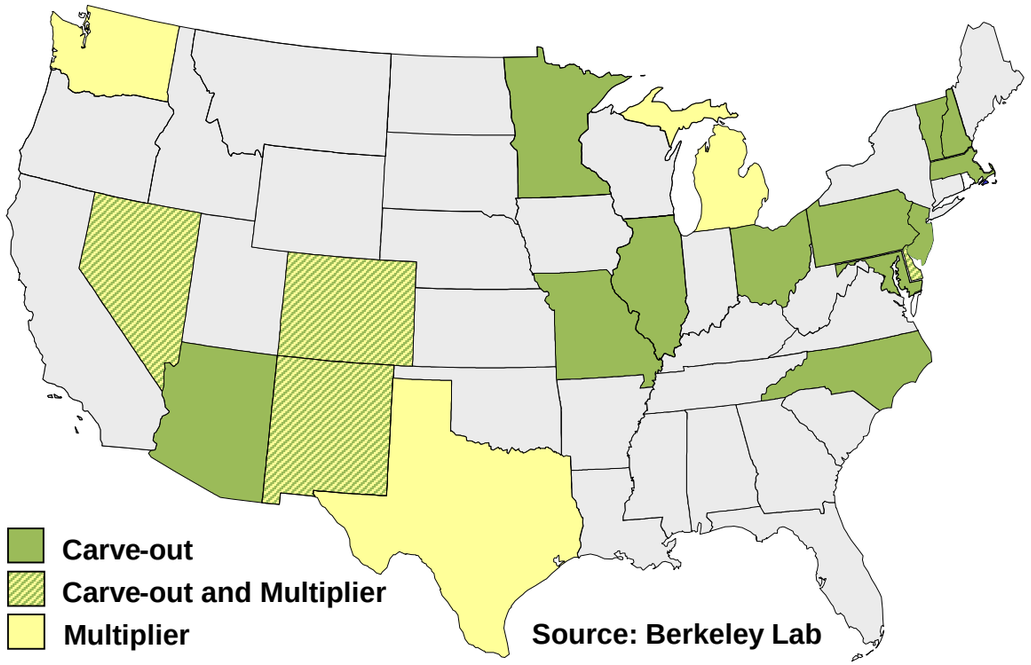
RPS Policies and Rules Differ Significantly from State to State

Major Variations Across States

- Targets and timeframes
- Entities obligated and exemptions
- Eligibility rules related to technology, vintage, location, and deliverability
- Use of resource tiers, carve-outs, or multipliers (e.g., see map)
- REC definitions, limitations, and tracking systems
- Contracting requirements or programs
- RPS procurement planning/oversight
- Compliance enforcement methods, reporting, and flexibility rules
- Existence and design of cost caps, alternative compliance payment rates

Solar or Distributed Generation (DG) Carve-Outs and Credit Multipliers

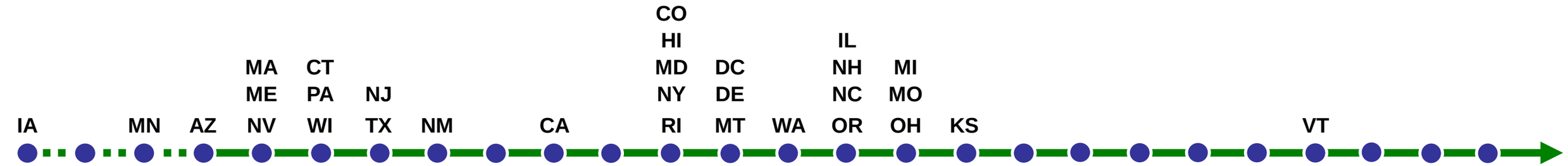


16 states + D.C. have solar or DG carve-outs, sometimes combined with credit multipliers; 3 other states only have credit multipliers

Most RPS Policies Have Been on the Books for a Decade or More

But states continue to make regular and significant revisions

RPS Enactment



Major Revisions

1991	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
IA	*MN*	*AZ*	*MN*	*NM*	*CT*	*NJ*	*CT*	*AZ*	*CA*	*DC*	*HI*	*CO*	*CA*	*MA*	*CO*	*IL*	*CA*	*DC*	*CT*	*CA*
	WI		*NV*		*MN*	*NM*	*CO*	*CA*	*CO*	*DE*	*IL*	*DE*	*CT*	*MD*	*CT*	*MA*	*CT*	*IL*	*MA*	*CT*
					NV	*PA*	*NV*	*CT*	*CT*	*HI*	*ME*	*IL*	*DC*	*NJ*	*MD*	*OH*	*HI*	*MA*	*MD*	*MA*
							TX	*HI*	*DE*	*MA*	*MN*	*MA*	*DE*	*NH*	*MN*	*OR*	*KS*	*MI*	*ME*	*NJ*
								NJ	*MD*	*MD*	*NV*	*MD*	*IL*	*NM*	*MT*	*WI*	*VT*	*NY*	*NH*	*NY*
								WI	*ME*	*NJ*	*OR*	*NJ*	*MA*	*NY*	*NM*			*OR*	*PA*	
									MN		*RI*	*NY*	*MD*	*OH*	*NV*			*RI*		
									NJ				*NC*							
									NM				*WI*							
									PA											
									TX											

Source: Berkeley Lab
Current as of October 2018

General Trends in RPS Revisions

Increasing and extending RPS targets: More than half of all RPS states have raised their overall RPS target or carve-out at some point since initial RPS adoption; many in recent years

Long-term contracting programs: Often aimed at regulated distribution utilities in competitive retail markets; may target specific types of resources (solar/DG, offshore wind)

Addressing valuation and integration issues: Though still an emerging trend, several states have created separate “clean peak” standards or energy storage targets in tandem with an RPS

Adjusting alternative compliance payment (ACP) rates and cost caps: Both increases and decreases have occurred as states seek to achieve compliance at least-cost

Refining resource eligibility rules: Particularly for hydro and biomass (e.g., related to project size, vintage, eligible feedstock, repowered facilities); also geographic eligibility rules

Although many states have introduced bills to repeal, reduce, or freeze their RPS programs, only two (OH, KS) have thus far been enacted

RPS Legislation and Other Revisions in 2018 (to-date)

Most proposals sought to strengthen or make small technical changes

RPS-Related Bills Introduced and Enacted in 2018

	Strengthen	Weaken	Neutral	Total
Introduced	**48**	**22**	**31**	**101**
Enacted	**4**	**1**	**6**	**11**

Data Source: EQ Research (August 31, 2018)
Notes: Includes legislation from 2018 sessions, 2017-2018, and 2018-2019 sessions. Companion bills in both chambers are counted as a single bill.

"Major" RPS revisions in 2018:

- **CA:** Increased RPS to 60% by 2030 and added goal of 100% zero-carbon electricity by 2045
- **CT:** Increased and extended Class I target to 40% by 2030, reduced Class I ACP rate, and created a new long-term contracting program
- **MA:** Increased Class I growth rate to 2% of retail sales per year over 2020-2029 period, and added a clean peak standard
- **NJ:** Increased and extended Tier I target to 50% by 2030, phases out solar carve-out, increased offshore wind energy carve-out to 3,500 MW, and created new caps on RPS compliance costs
- **NY:** Created offshore wind procurement program with a target of 2,400 MW by 2030

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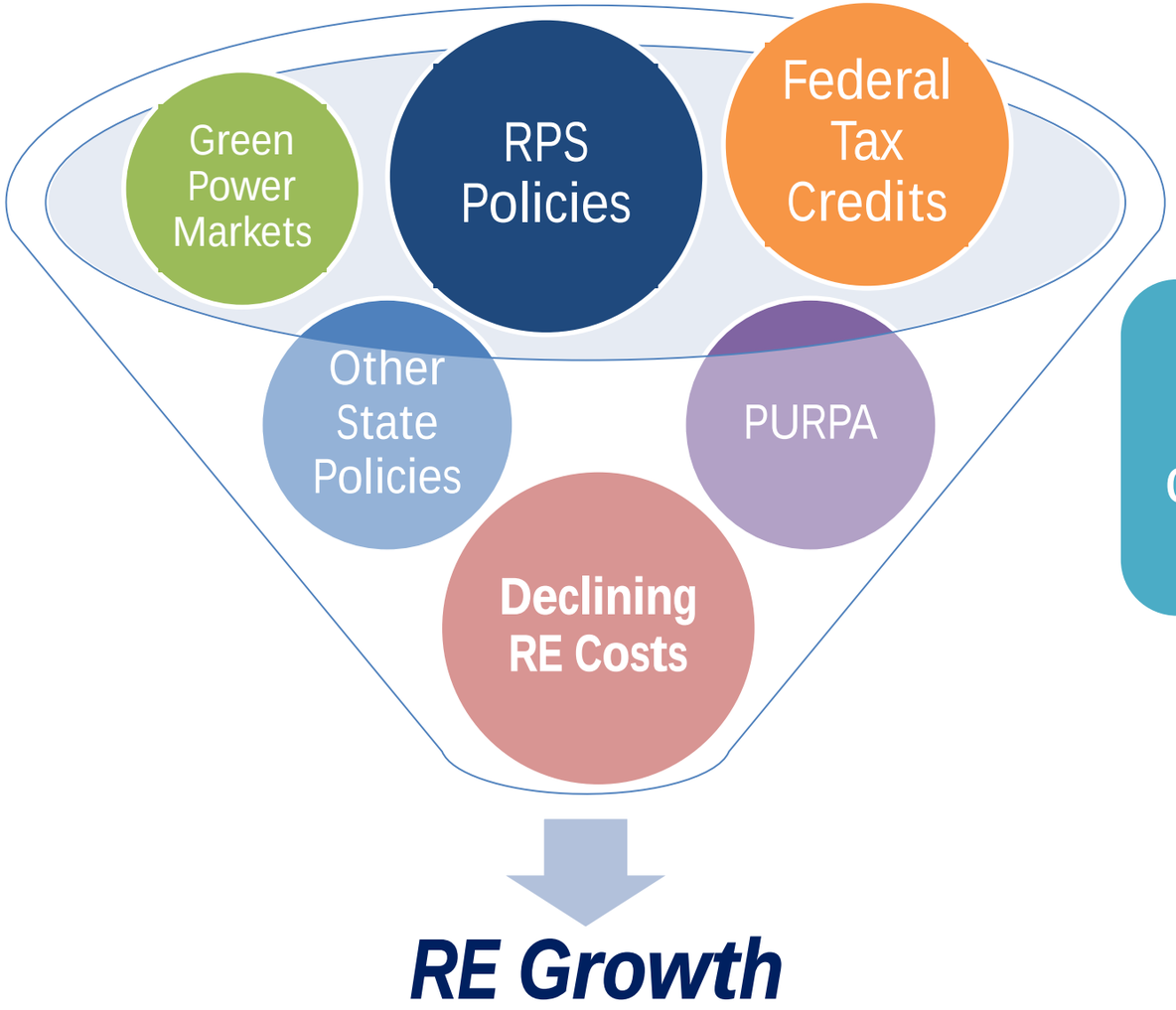
RPS Policies Exist amidst a Broader Array of Market and Policy Drivers for RE Growth

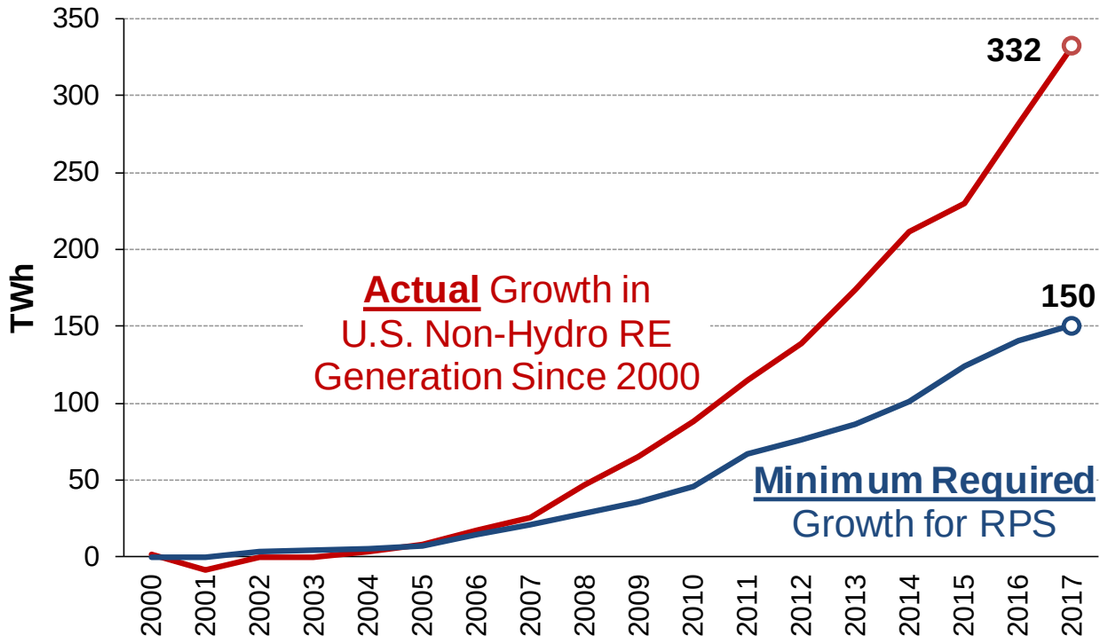


Separating out the incremental impact of any one driver is challenging, given potential overlaps and interactions

RPS Policies Have Been One Key Driver for RE Generation Growth

RPS requirements constitute roughly half of total U.S. RE growth since 2000

Growth in Non-Hydro Renewable Generation: 2000-2017



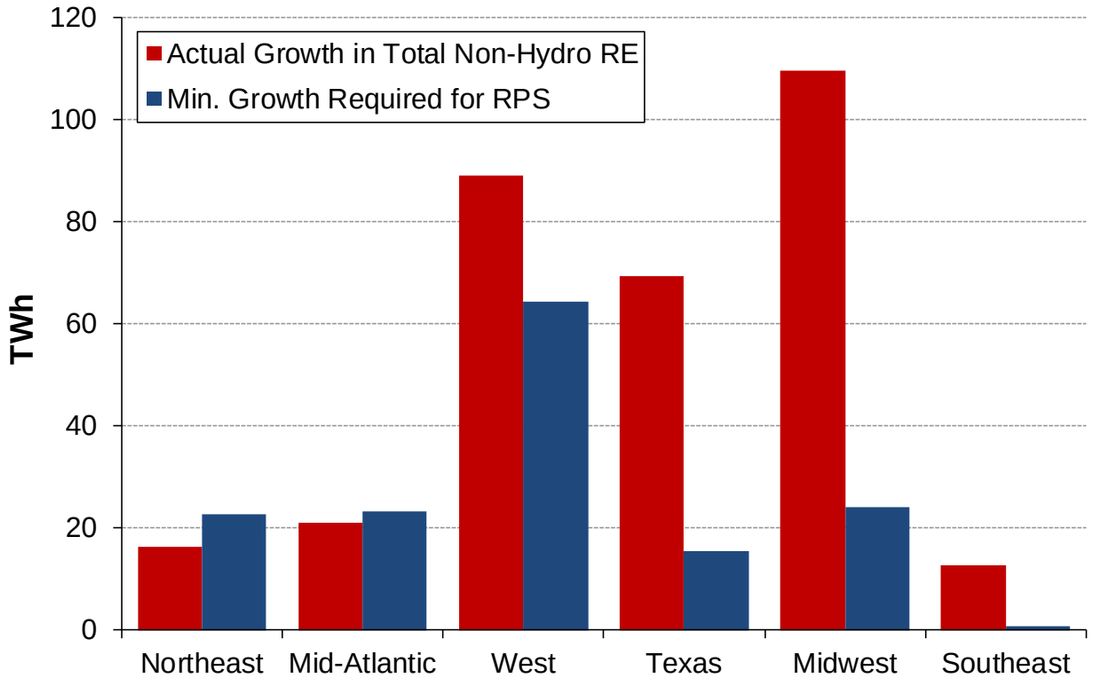
Notes: Minimum Growth Required for RPS excludes contributions to RPS compliance from pre-2000 vintage facilities, and from hydro, municipal solid waste, and non-RE technologies. This comparison focuses on non-hydro RE, because RPS rules typically allow only limited forms hydro for compliance.

- Total non-hydro RE generation in the U.S. grew by 332 TWh since 2000
  - Many factors contributed to that growth (tax credits, other incentives, cost declines, etc.)
- RPS policies required 150 TWh increase over the same period (45% of total RE growth)
  - Not strict attribution: some of that would have occurred without RPS
- RE growth outside of RPS's associated with:
  - Voluntary green power markets, including corporate procurement
  - Net metering
  - Economic utility purchases

RPS Role in Driving RE Growth Varies by Region

Seemingly most critical in the Northeast, Mid-Atlantic, West

Growth in Non-Hydro Renewable Generation: 2000-2017



Notes: Northeast consists of New England states plus New York. Actual growth shown for that region is estimated based on new RE capacity that meets the vintage requirements for RPS eligibility. Mid-Atlantic consists of states that are primarily within PJM (in terms of load served).

Northeast, Mid-Atlantic, West

- Actual RE growth corresponds relatively well with RPS needs
- Northeast and Mid-Atlantic also draw on RECs from neighboring regions to meet compliance obligations

Texas and the Midwest

- Actual RE growth has far-outpaced RPS needs, driven by attractive wind energy economics

Southeast

- Negligible regional RPS demand (only NC), though some RE growth serving RPS demand in PJM
- Recent growth in utility-scale solar driven by utility procurement

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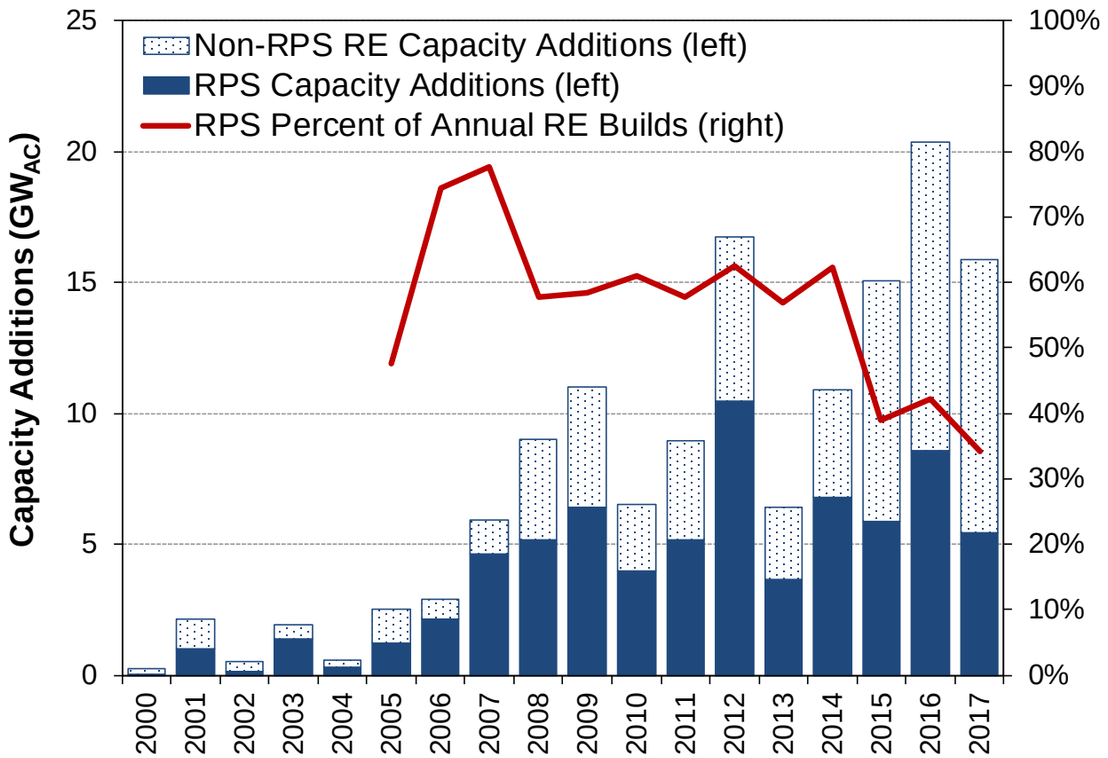
RPS's Have Provided a Stable Source of Demand for RE New-Builds

Though RPS *portion* of annual RE capacity additions has declined in recent years

Annual Renewable Capacity Additions

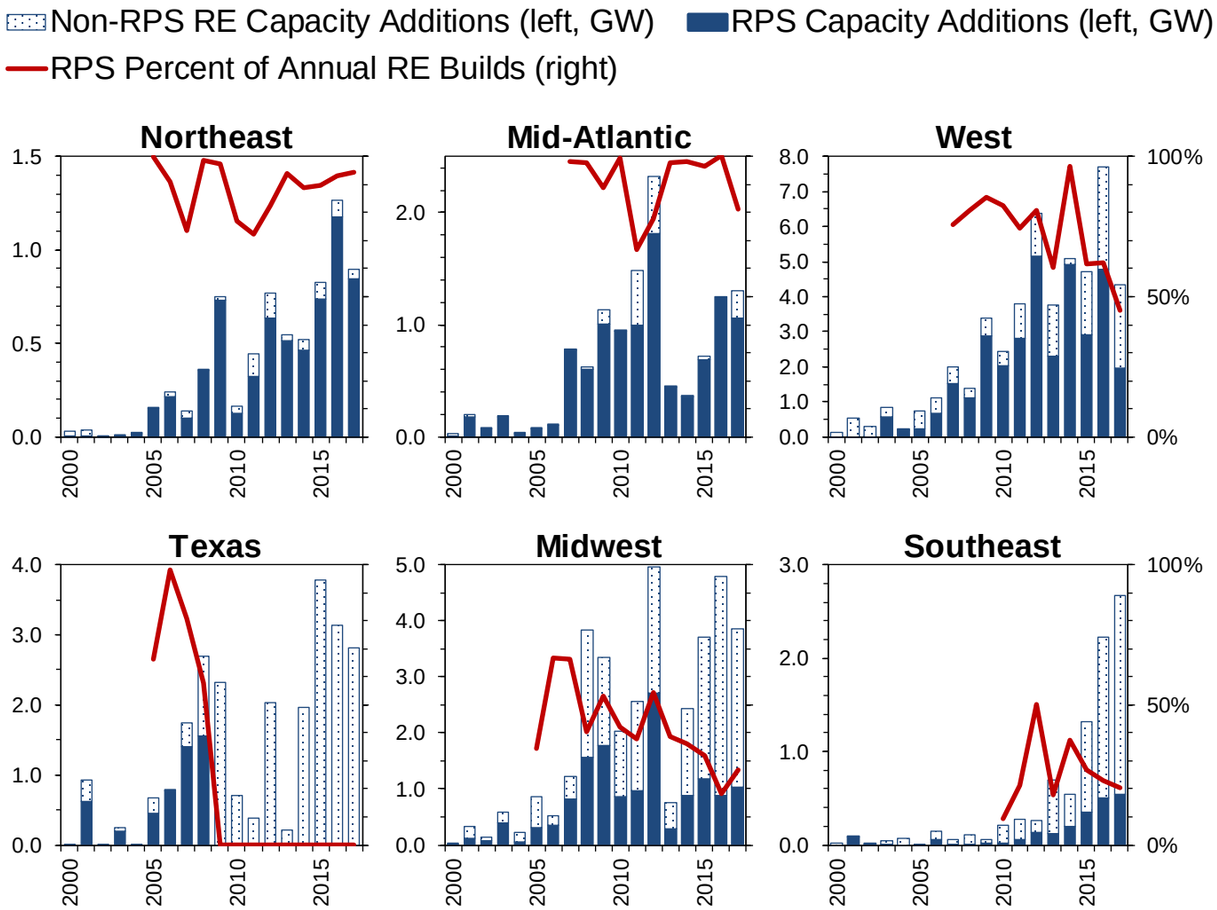


Notes: RPS Capacity Additions consists of RE capacity contracted to entities with active RPS obligations or sold on a merchant basis into regional RPS markets.

- Over the past decade, 4-8 GW per year of RE capacity added for RPS demand (6 GW/yr. on average)
  - Has provided a floor in down years (e.g., 2010, 2013)
- RE capacity additions servicing RPS obligations constitute just over half (~52%) of the 140 GW added since 2000
- The RPS-portion of new RE builds has declined over the past three years to 34% in 2017 (vs. 60% in 2008-14)
- Recent RE growth outside of RPS programs primarily consists of:
  - Continued strong wind growth in Texas and the Midwest
  - Net-metered PV (especially in California)
  - Emergence of utility-scale PV in non-RPS markets

RPS Policies Remain Central to RE Growth in Particular Regions

Recent RE additions in Northeast, Mid-Atlantic, West primarily serve RPS demand



Notes: See earlier slide for regional definitions

RPS policies have been a ***larger*** driver in…

- **Northeast:** Relatively small market, but almost all capacity additions serving RPS demand
- **Mid-Atlantic:** Combo of solar carve-out capacity and wind projects (merchant or corporate procurement, but RPS-certified and likely selling RECs for RPS needs)
- **West:** The bulk of U.S. RPS capacity additions in recent years; split evenly between CA and other states

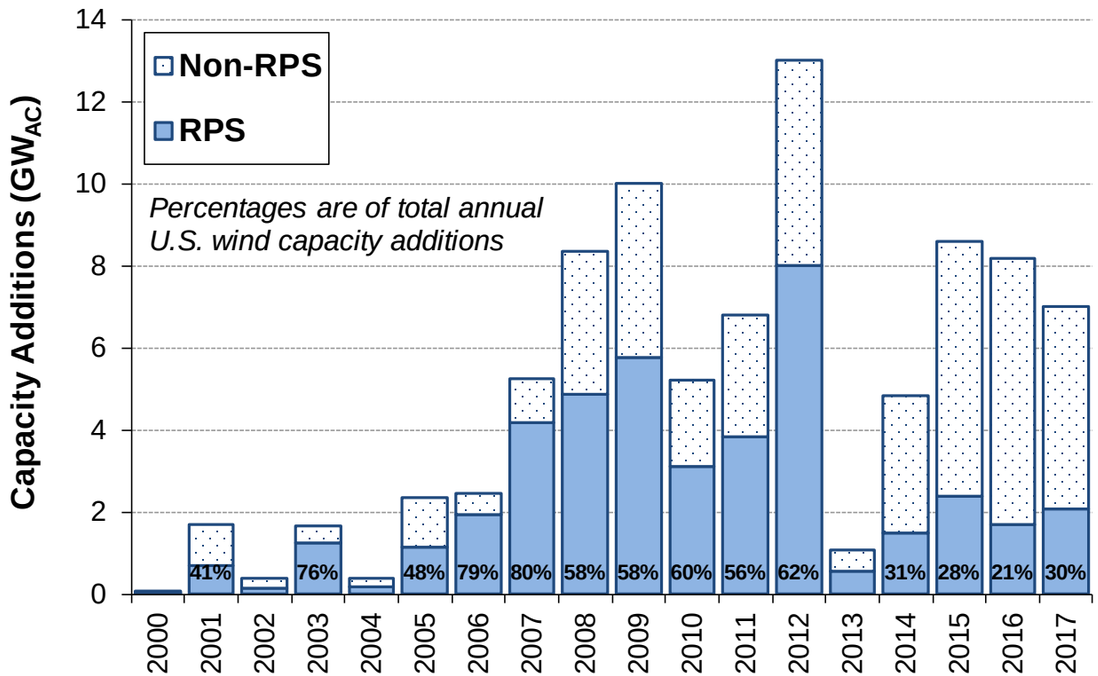
But have been a ***smaller*** driver in…

- **Texas:** Achieved its final RPS target in 2008 (7 years ahead of schedule); all growth since is Non-RPS
- **Midwest:** Lots of wind development throughout the region, some contracted to utilities with RPS needs
- **Southeast:** RE growth almost all utility-scale PV; primarily driven by PURPA and utility procurement, but some serving RPS demand in NC and PJM

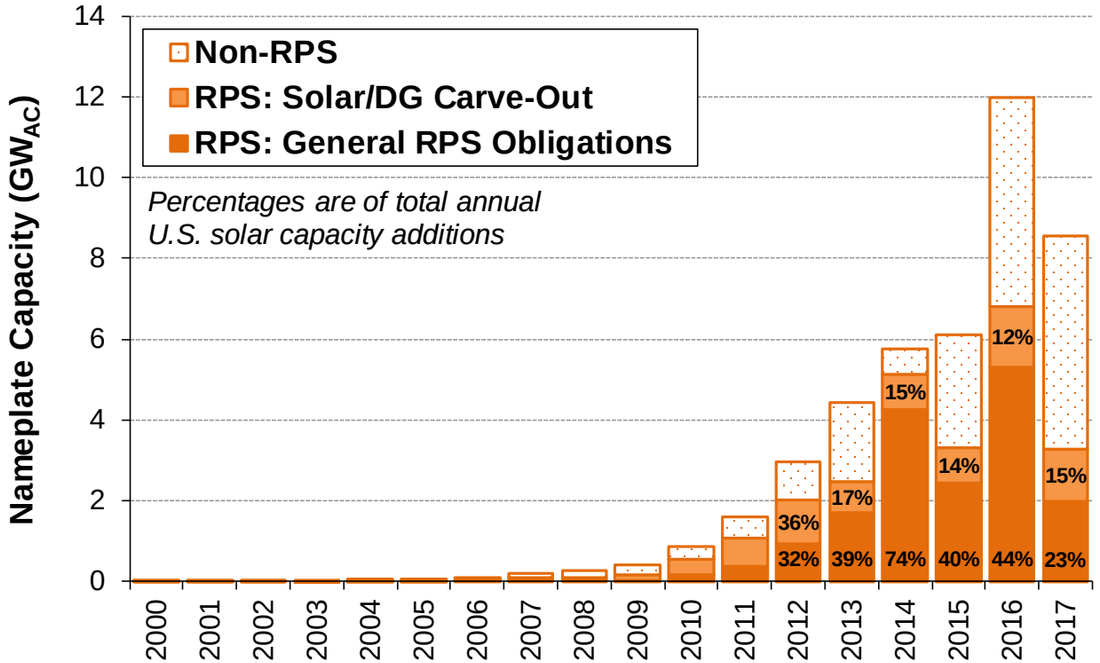
RPS's Have Historically Been a More Significant Driver for Solar Growth than for Wind, But That Is Changing

In 2017, **30%** of all wind additions were dedicated to RPS demand, while **38%** of solar additions serve RPS needs (23% for general RPS obligations + 15% for carve-outs)

Wind Capacity Additions



Solar Capacity Additions



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Most States Won’t Reach Their Final RPS Year Until at Least 2025

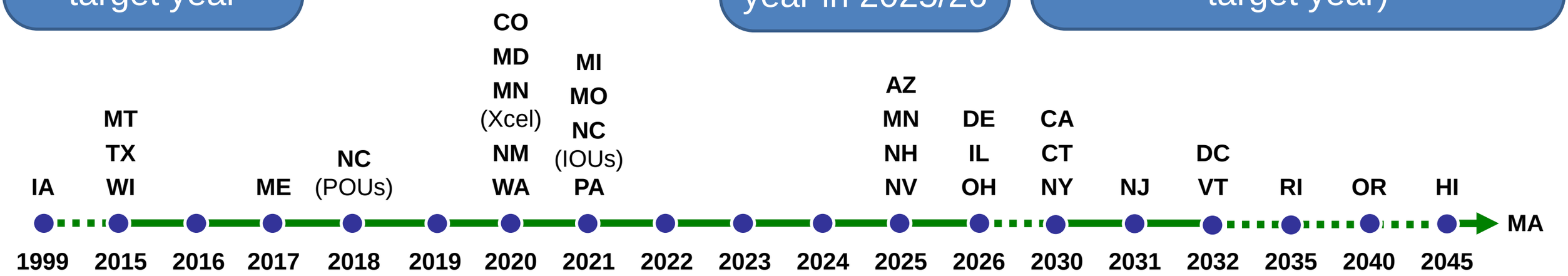
Year of Maximum RPS Percentage Requirement

5 states have passed their terminal RPS target year

8 others will do so within the next few years

7 states will hit their terminal RPS target year in 2025/26

10 states have targets extending to 2030 or beyond (incl. MA, which has no final target year)

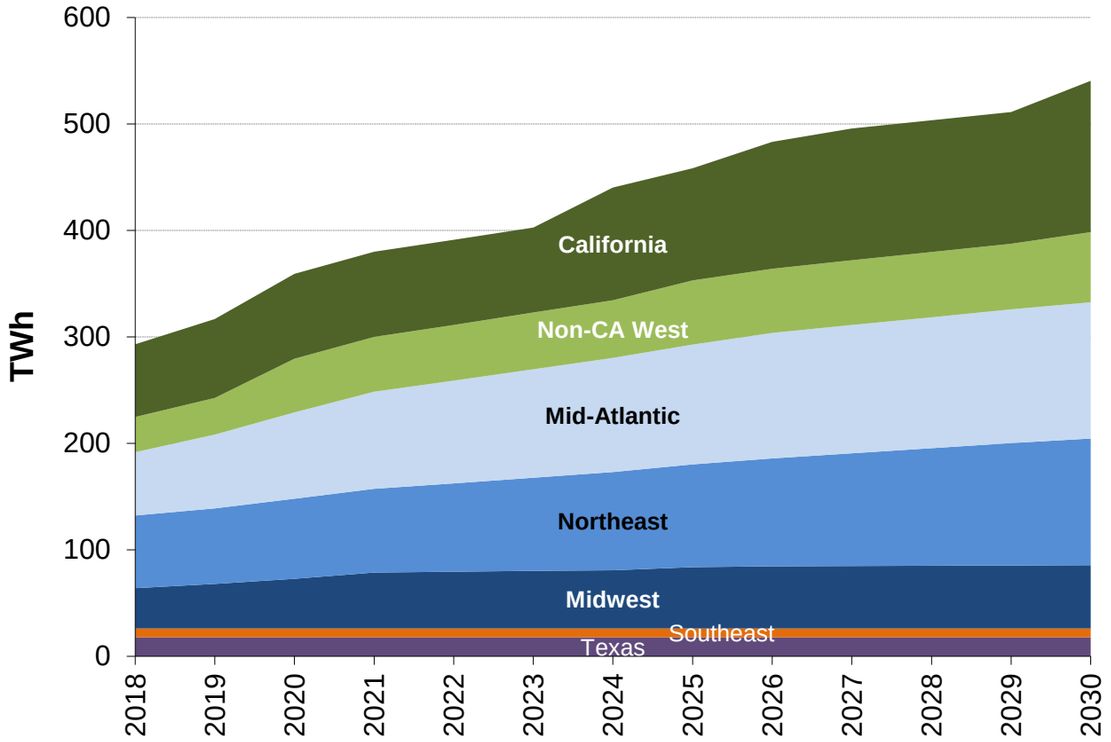


RPS needs will continue to slowly grow after final targets, due to load growth and RE retirements

Projected RPS Demand (i.e., total RPS compliance requirement)

Total U.S. RPS demand grows by 80% through 2030

Projected RPS Demand (TWh)



Notes: Projected RPS demand is estimated based on current targets, accounting for exempt load, likely use of credit multipliers, offsets, and other state-specific provisions. Underlying retail electricity sales forecasts are based on regional growth rates from the most-recent EIA Annual Energy Outlook reference case.

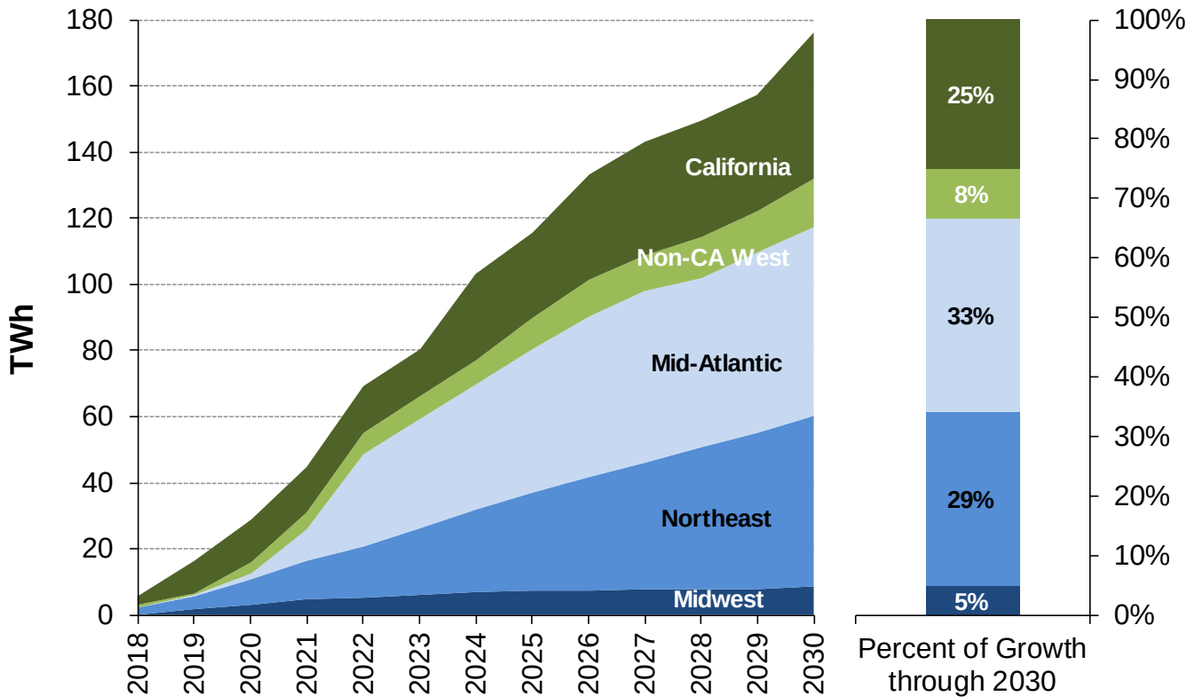
- Under current policies, total RPS demand grows from roughly 290 TWh in 2018 to 540 TWh in 2030
  - Represents the total RE needed to satisfy RPS compliance requirements in each year
- To be sure, increased demand does not equate to required increase in supply
  - Some utilities and regions are ahead of schedule, others are behind
  - Some growth in RPS demand will be met with banked RECs

State-level RPS demand projections available for download at: rps.lbl.gov

Required Increase in RPS Generation Supply

Equates to almost a 50% increase in U.S. renewable energy generation

Required Increase in RPS Generation (TWh)



Notes: For regulated states, incremental RPS needs are estimated on a utility-specific basis, based on each utility's RPS procurement and REC bank as of year-end 2017. For restructured states, incremental RPS needs are estimated regionally, based on the pool of RPS-certified resources registered in the regional REC tracking system, allocated among states based on eligibility, demand, and other considerations.

Required increase in RPS supply estimated:

- Relative to *available* RPS resources as of year-end 2017 (see figure notes for further details)
- Accounting for REC banking over the forecast period, per each state's rules

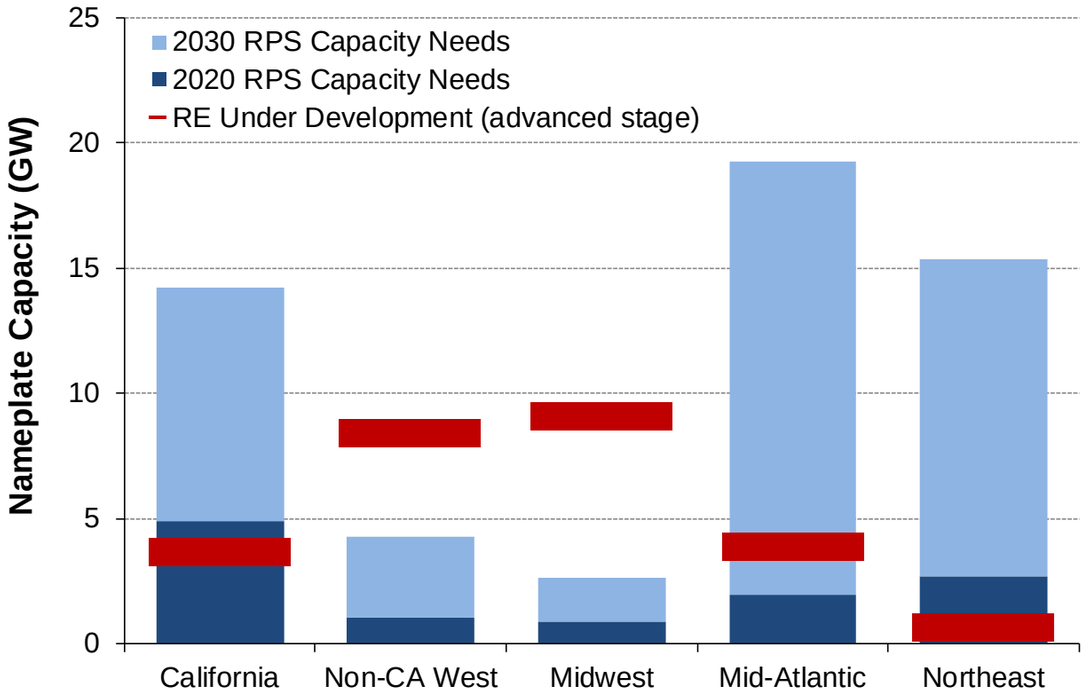
- 180 TWh increase in RPS resources needed to meet RPS demand growth through 2030
  - By comparison, current U.S. RE = ~400 TWh
- Greatest incremental needs in:
  - **Mid-Atlantic** (boosted by recent legislation in NJ and IL, but also significant needs for OH)
  - **Northeast** (mostly NY's 50%-by-2030 standard)
  - **California** (60% statewide RPS by 2030)

Required RE Capacity Builds for RPS

Roughly 12 GW needed by 2020, 56 GW by 2030

- Requires an average build-rate of 4 GW per year
  - Below historical rate (7 GW/year for RPS-related capacity additions, 12 GW/year for all RE capacity additions)
- 36 GW of new RE capacity currently under development (and at an advanced stage) will meet some of these incremental needs
  - Especially in Non-CA West and Midwest (and potentially in neighboring regions)
  - Not all of that capacity will be available for RPS needs
  - An additional ~130 GW of new capacity at earlier stages of development not counted here
- Retirement of existing RPS capacity is not captured in this analysis, but will require additional new RE capacity over time

Required Increase in RPS Capacity (GW)



Notes: Calculated from estimated incremental generation needed to meet RPS demand, based on state-specific assumptions about the mix and capacity factor of new RPS supply. RE Under Development consists of units permitted or under construction, site preparation, or testing as of October 2018, plus units that entered commercial operation in 2018, based on data from ABB-Ventyx Velocity Suite.

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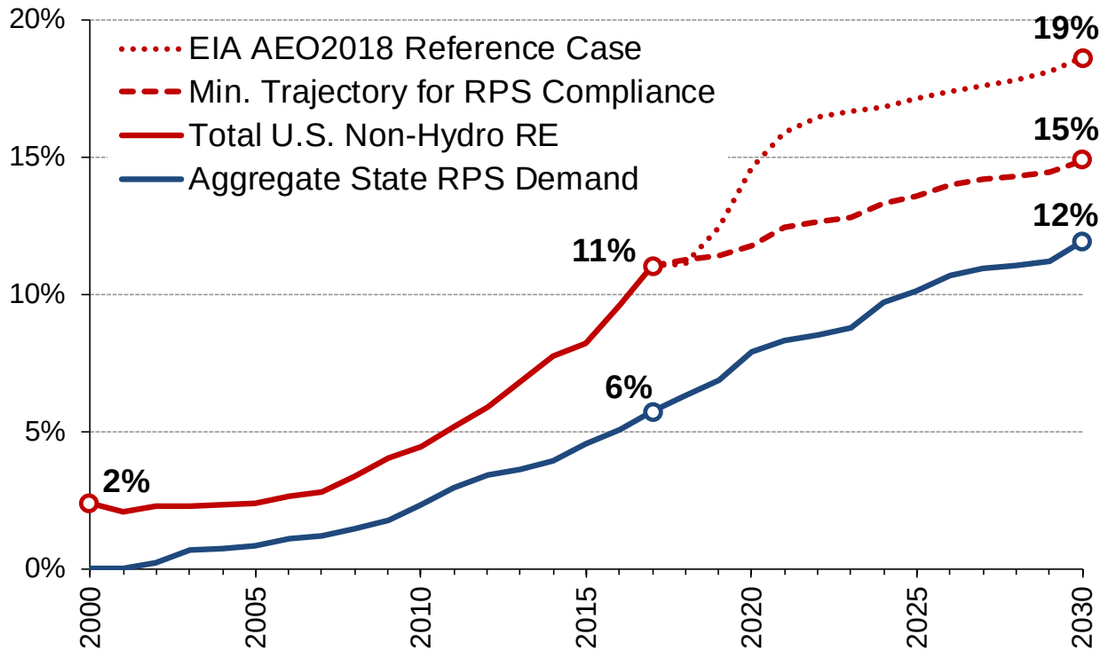
Comparison of U.S. RPS Demand and RE Supply

EIA-forecasted RE growth projected to well-exceed minimum RPS needs

U.S. RPS Demand vs. RE Supply
(% of U.S. Retail Electricity Sales)



Notes: The figure focuses on non-hydro RE, given the limited eligibility of hydro for state RPS obligations. Accordingly, the Aggregate State RPS Demand excludes historical and projected contributions by hydro as well as by municipal solid waste, demand-side management, and other non-RE technologies.

- In aggregate, state RPS targets equate to 12% of U.S. retail electricity sales by 2030
- To meet those targets, total U.S. RE supply will need to reach 15% of retail sales
  - Accounts for the fact that not all existing RE supplies are available for future RPS demand
- EIA projects much greater RE growth, reaching 19% of retail sales by 2030
  - Rapid growth prior to expiration of ITC/PTC in early 2020s, followed by slower growth through 2030
- RPS policies clearly just one driver for continued RE growth

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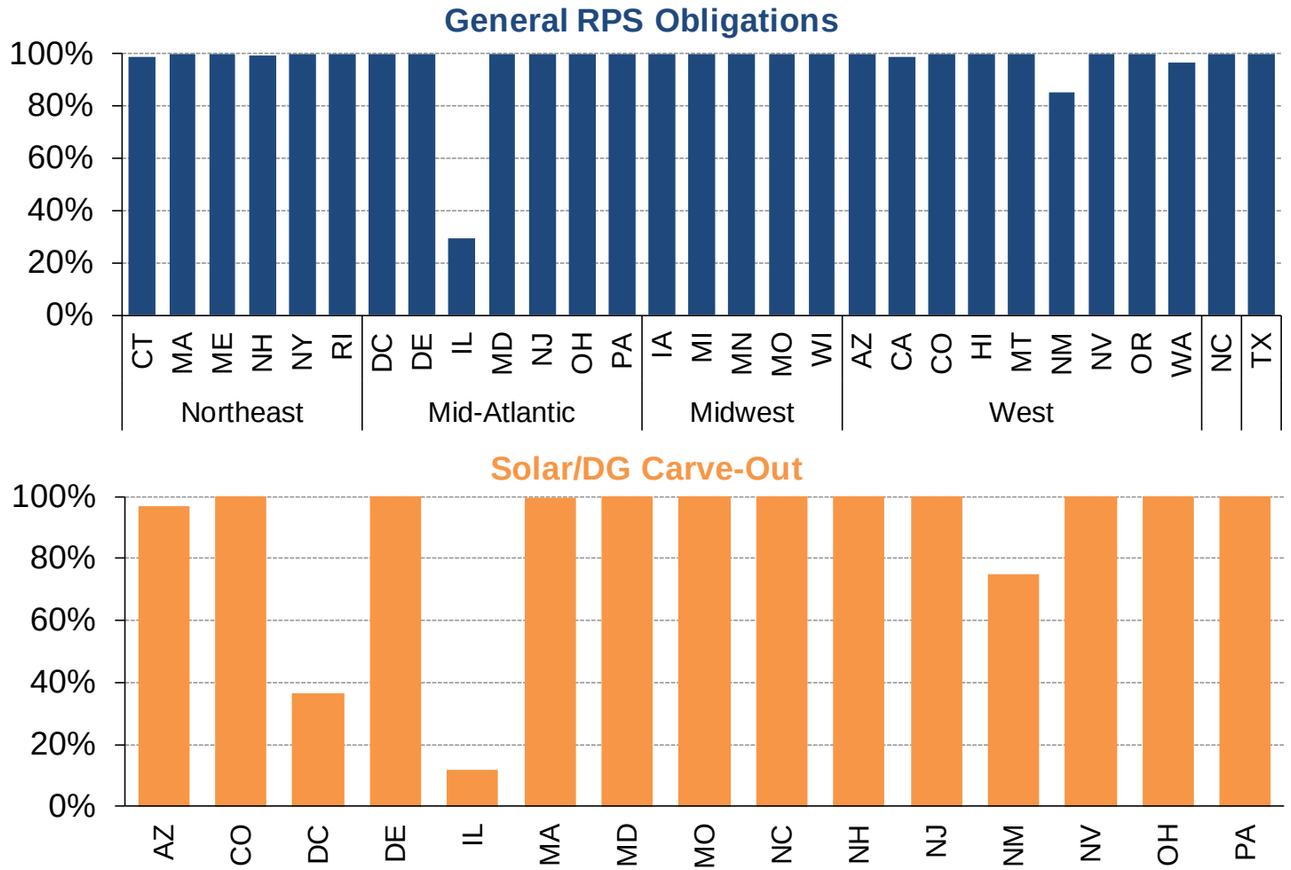
States Have Generally Met Their Interim RPS Targets

Exceptions typically reflect unique state-specific issues

Percentage of RPS Obligations Met with RECs or RE
For most-recent compliance year available in each state



- Many states/utilities well ahead of schedule, easily meeting interim targets
- Others met interim targets only by relying on stockpile of banked RECs from prior years
- Relatively few instances where interim targets significantly missed
  - **DC (Solar):** In-district eligibility requirements limit pool of supply
  - **IL (General RPS & Solar):** Alternative retail suppliers required to meet at least 50% of RPS with ACPs
  - **NH (Solar):** Unusually low solar ACPs have led to SRECs flowing into neighboring Class I markets
  - **NM (General RPS & Solar/DG):** Procurement reduced due to large-customer cost caps

Notes: "General RPS Obligations" refers to the non-carve-out portion of RPS requirements in each state. For New England states, it refers to Class I obligations, and for PJM states it refers to Tier I obligations.

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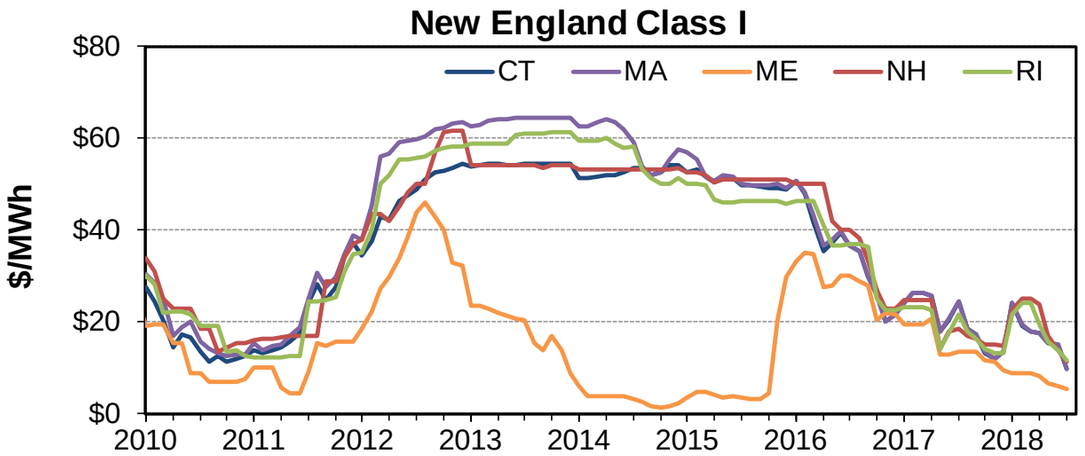
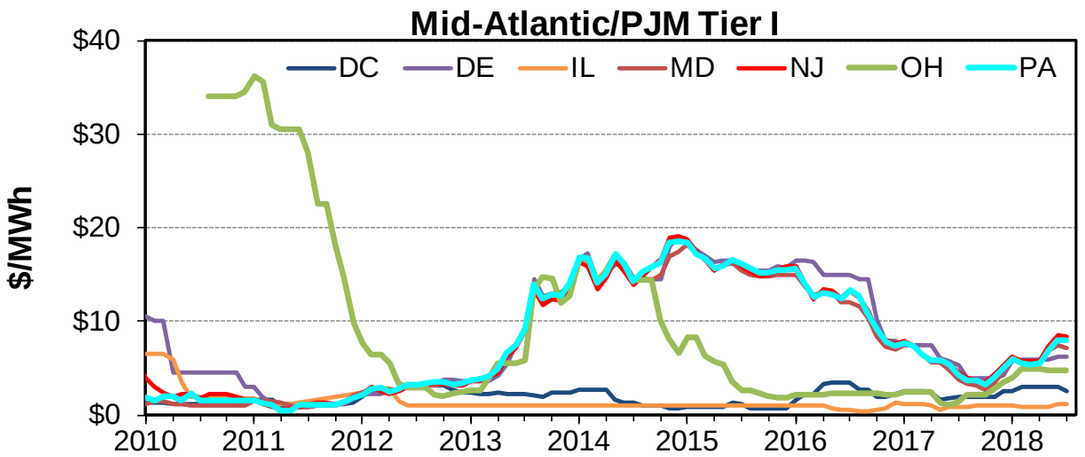
REC Pricing Trends for "Primary Tier" RPS Obligations

Prices in 2018 continuing to slide in New England, rebounding upward in PJM





Source: Marex Spectron. Plotted values are the average monthly closing price for the current or nearest future compliance year traded in each month.

REC prices are a function of supply-demand balance and ACP rates

- As a result, REC prices can be volatile, sensitive to changes in eligibility rules
- Regional markets in New England and Mid-Atlantic emerge based on common pools of eligible supply

New England:

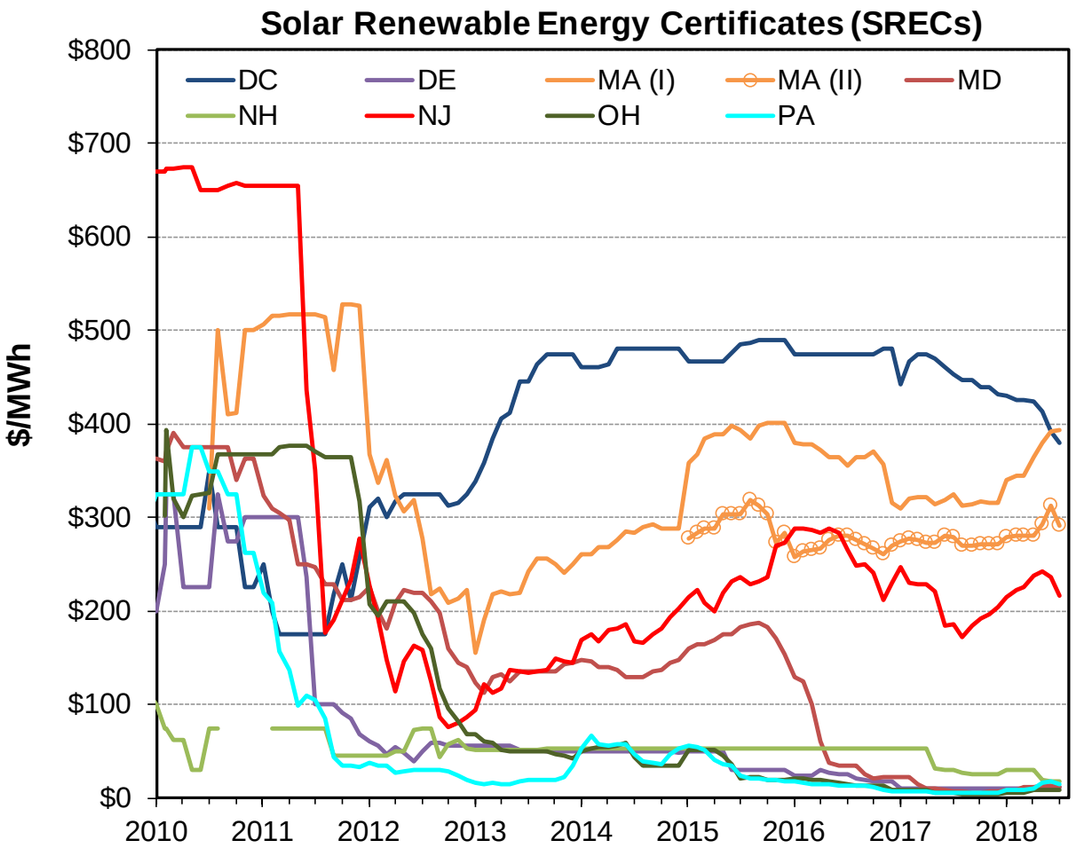
- Growing regional supplies have pushed prices to all time lows (~$10/MWh, compared to $55-65 ACP levels)

Mid-Atlantic/PJM:

- Bifurcated market based on geographic eligibility rules (more restrictive rules & higher prices in NJ/PA/MD/DE)
- Wind growth in PJM and adjacent states drove prices down from historical peak, prior to recent rebound

SREC Pricing Trends for RPS Solar Carve-Outs

2018 has seen some movement in DC, NJ, MA; other states remain over-supplied



Sources: Marex Spectron, SRECTrade, Flett Exchange. Depending on the source used, plotted values are either the mid-point of monthly average bid and offer prices or the average monthly closing price, and generally refer to prices for the current or nearest future compliance year traded in each month.

SREC pricing is highly state-specific due to *de facto* in-state requirements in most states and varying ACPs

- **DC:** Acute undersupply due to in-district requirements; downward trend in 2018 due to grandfathering provisions
- **MA:** Price movements bounded by clearinghouse floor and SACP
- **NJ:** Fairly well-balanced market; looming oversupplies averted by recent legislation
- **MD:** Substantial over-supply emerged in 2015-2016 causing prices to bottom out, where they have remained
- **DE, PA**, **OH** heavily oversupplied, in part due to eligibility of out-of-state projects
- **NH:** Low solar ACP ($55/MWh)

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RPS Compliance Costs

Definition, data sources, and limitations

RPS Compliance Costs: Net cost to the load-serving entity (LSE), above and beyond what would have been incurred in the absence of RPS

Retail Choice (Restructured) States

- RPS compliance primarily via unbundled RECs
- We estimate RPS compliance costs based on REC plus ACP expenditures
- Rely wherever possible on PUC-published data on actual REC costs; otherwise use broker spot market prices
- ***Limitations:*** Growing use of bundled PPAs; ignores merit order effect and some transmission/integration costs

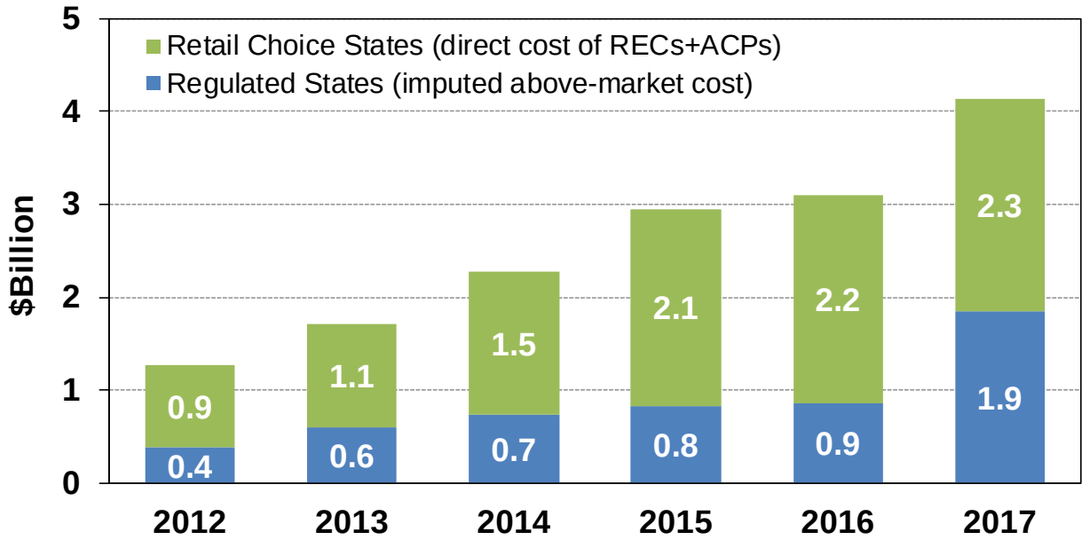
Regulated States

- RPS compliance primarily via bundled PPAs
- We synthesize available utility and PUC compliance cost estimates
- Compliance costs imputed by comparing gross RPS procurement costs to a counterfactual (e.g., market prices or a long-term avoided cost projection)
- ***Limitations:*** Varying methods across states; incomplete or sporadic reporting (no data for several states)

Aggregate U.S. RPS Compliance Costs

Totaled roughly $4.1B in 2017, up from $3.1B in 2016

Total RPS Compliance Costs



Notes: Retail Choice States include New England, PJM, and New York; the costs shown for that group primarily reflect REC purchases and ACPs. Regulated States consist of all other states; costs shown for that group reflect PUC/utility estimates for the above-market cost of RPS resources. Costs were extrapolated for states/utilities without available data, based on other states/utilities in the region.

These data should be considered a rough approximation given diverse methods used to estimate compliance costs across states

- **In general, two countervailing dynamics**
  - RPS targets growing over time
  - While RE costs (or REC prices) are falling
- **Retail choice states**
  - Falling REC prices have largely offset increasing RPS targets (in aggregate) à Compliance costs flat since 2015
- **Regulated states**
  - Effect of falling PPA prices muted by mix of older (more expensive) and newer (less expensive) RPS resources
  - Sizeable cost increase from 2016-2017 driven primarily by a methodological issue in California (related to assumptions used to calculate avoided costs)*

** To calculate the above-market cost of RPS resources, the CPUC compares RPS procurement costs to the all-in cost of a combined-cycle gas turbine (the "Market-Price Referent" or MPR). Prior to 2017, the CPUC had been using an MPR based on 2011 natural gas prices and other assumptions. For the 2017 report, these assumptions were updated to reflect 2017 conditions.*

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RPS Compliance Costs as a Percentage of Customer Bills

Averaged 2.0% of retail electricity bills in 2017

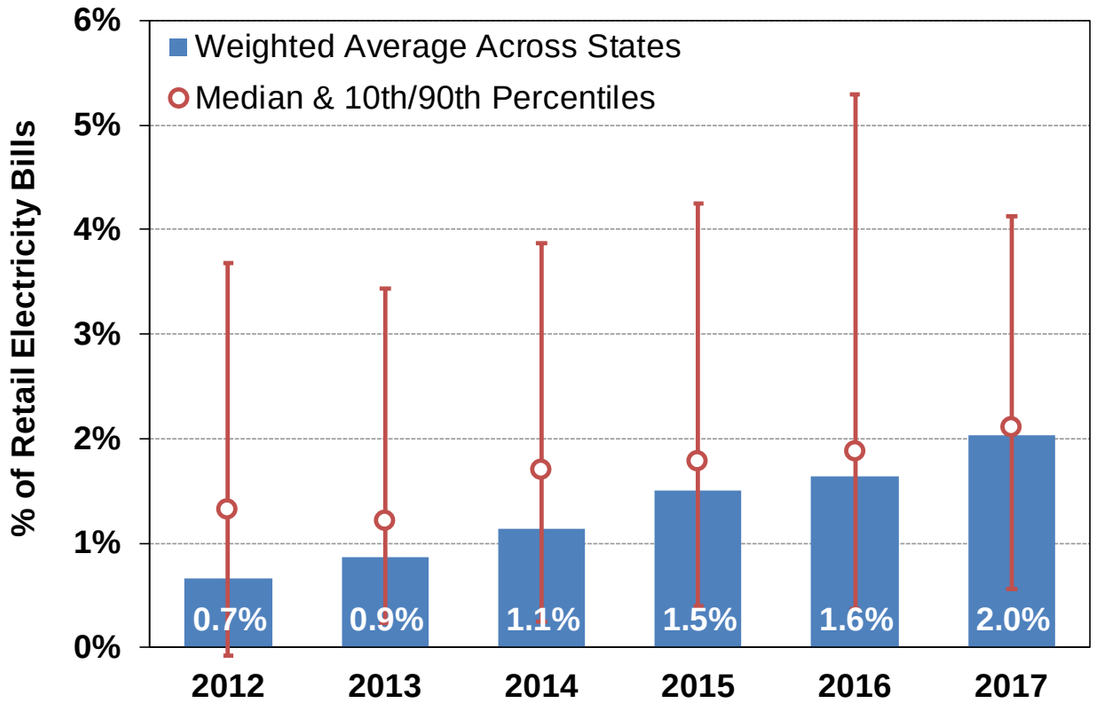
A proxy for "rate impact", albeit a rough one:

- Some impacts (merit order effect, integration costs) not fully captured
- Compliance costs borne by LSE not always fully or immediately passed through to ratepayers
- ACPs may be credited to ratepayers or recycled through incentive programs

- Costs as a percent of retail bills have generally risen over time with rising targets, as discussed on previous slide
- Wide variability across states, as evident by percentile bands, ranging from 0.6% to 4.1% in 2017 (10th to 90th percentile range) à more detail on next slide

RPS Compliance Costs

Percentage of Average Retail Electricity Bill

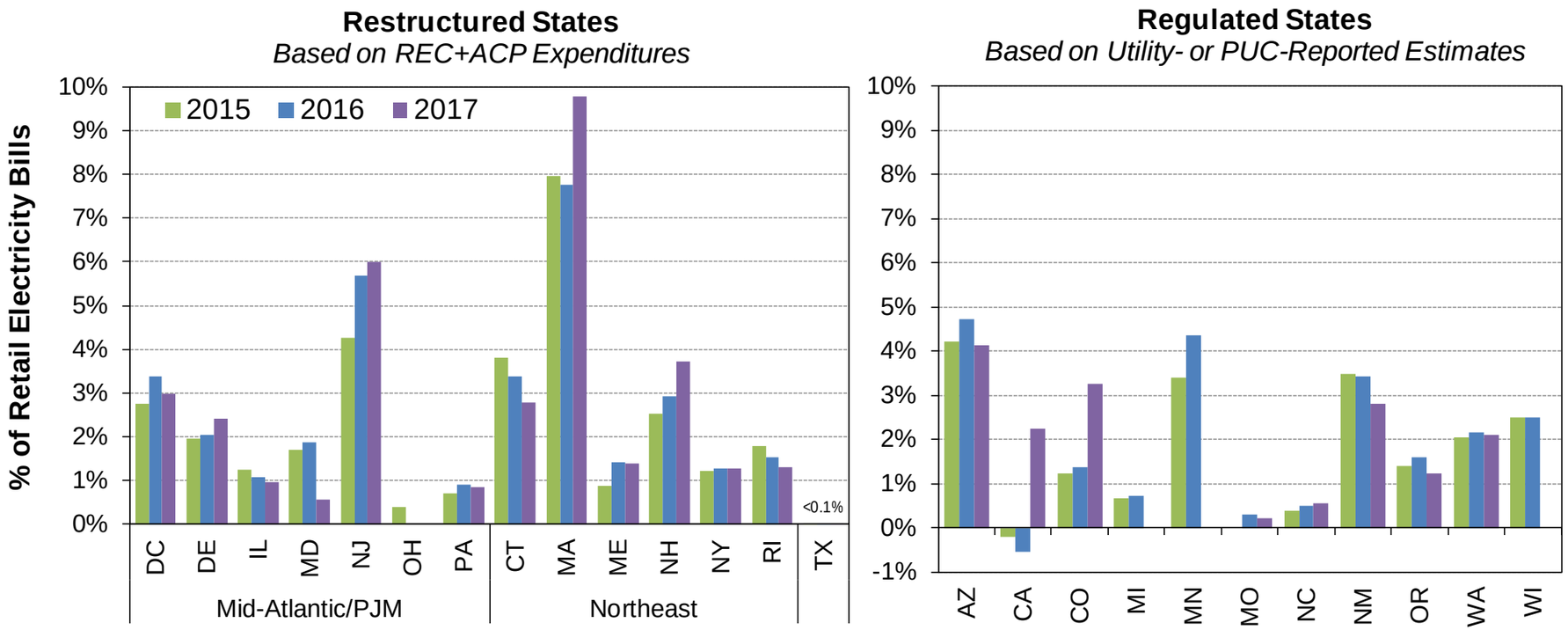


Notes: Annual averages are weighted based on each state's total revenues from retail electricity sales. 2016 and 2017 compliance cost data are provisional, as several states have yet to finalize compliance results for those years.

State-Specific RPS Compliance Costs

Reflect differences in both policy design and underlying RE economics

RPS Compliance Costs *(Percentage of Average Retail Electricity Bill)*



Cross-state variation in RPS compliance costs the result of differences in:

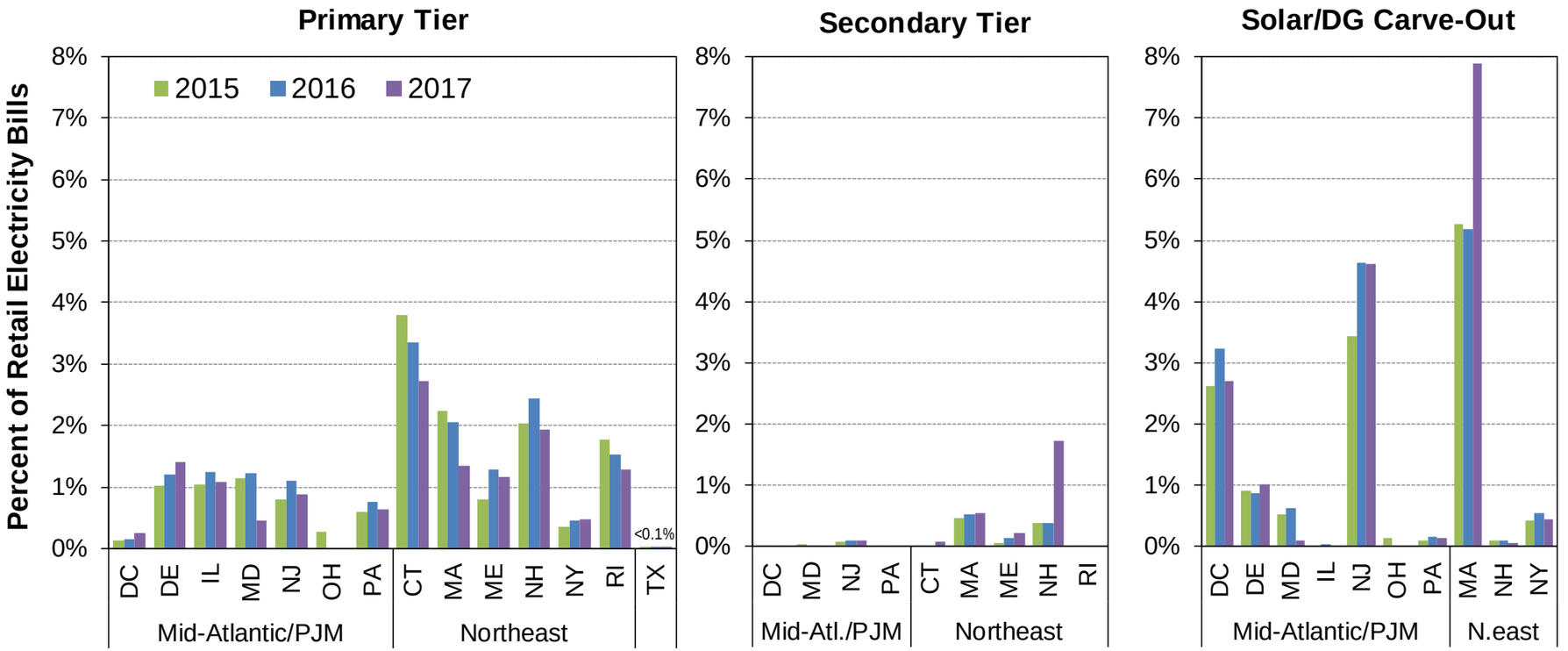
- RPS target levels
- Resource tiering/mix
- Local RE costs/characteristics
- REC prices
- Balance between short/long-term procurement instruments
- Reliance on pre-existing resources
- Wholesale electricity prices
- State-specific cost calculation methods

Notes: RPS compliance cost estimates for restructured states are based, whenever possible, on the average cost of all RECs retired for compliance, including both spot market purchases and long-term contracts. For states with compliance years that begin in the middle of each calendar year (DE, IL, NJ, and PA), compliance years are mapped to the figure based on the end-date of each compliance year. Compliance cost data are wholly unavailable for IA, HI, MT, NV, and VT; these states are therefore omitted from the chart.

RPS Compliance Costs by Resource Tier

Restructured states only

RPS Compliance Costs *(Percentage of Average Retail Electricity Bill)*



Notes: RPS compliance cost estimates for restructured states are based, whenever possible, on the average cost of all RECs retired for compliance, including both spot market purchases and long-term contracts. For states with compliance years that begin in the middle of each calendar year (DE, IL, NJ, and PA), compliance years are mapped to the figure based on the end-date of each compliance year. Several regulated states also include RPS carve-outs, but compliance cost data typically are not available for those carve-outs specifically.

Primary Tier: Geographic trends reflect differences in PJM Tier 1 and NEPOOL Class I REC prices; fairly consistent downward trend with falling REC prices

Secondary Tier: Generally a marginal contributor to overall RPS compliance costs (due to low REC prices)

Solar/DG Carve-Out: The largest component of RPS compliance costs in several states (DC, NJ, MA) with high SREC prices and/or relatively high targets

RPS Cost Containment Mechanisms

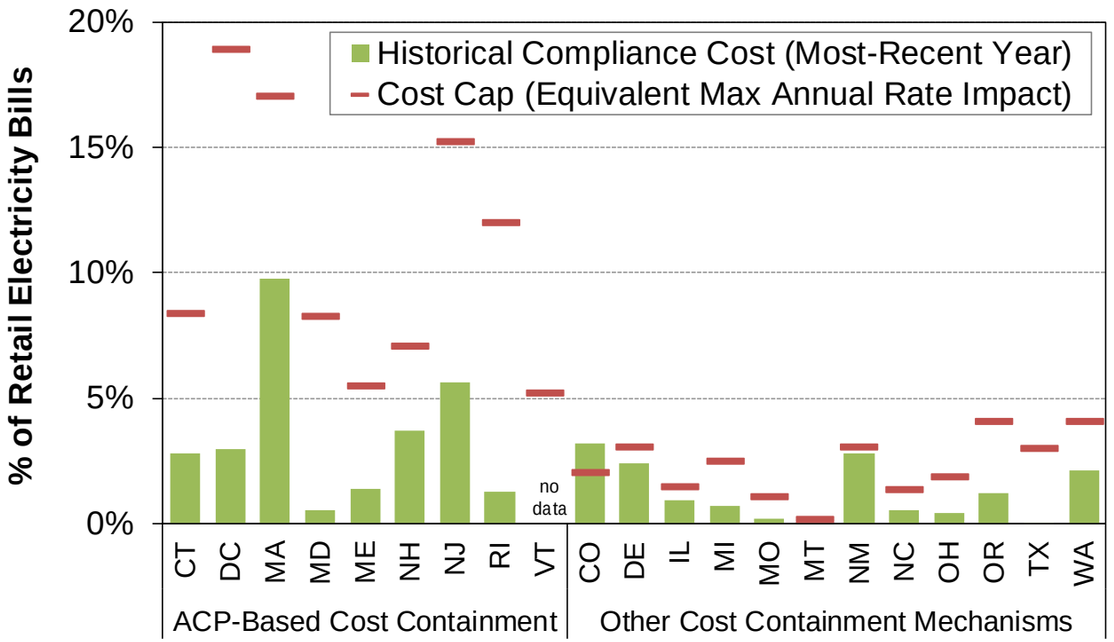
May cap growth in RPS compliance costs (depending on design & implementation)

RPS policies have various cost containment mechanisms

- ACPs (which cap REC prices)
- Caps on rate impacts or revenue-requirements
- Caps on surcharges for RPS cost recovery
- RE contract price caps
- Renewable energy fund caps
- Financial penalties
- Regulatory oversight of procurement

- Highest cost caps (10-20% of electricity bills) occur in states relying primarily on ACPs for cost containment and with relatively aggressive targets and/or high ACP rates
- Some cost containment mechanisms may function as a "soft" cap – e.g., due to PUC/utility discretion in enforcement, discretion in how costs are calculated, multi-year averaging or use of balancing accounts

Recent Costs Compared to Effective Cost Caps



Notes: Each state's cost containment mechanism was translated into the equivalent maximum allowed rate impact for the final year in the RPS (or whichever year is associated with the highest possible annual rate impact). For states with an ACP, this corresponds to a scenario in which the entire RPS obligation is achieved through ACPs. Excluded from the chart are states currently without any explicit mechanism to cap incremental RPS costs (AZ, CA, IA, HI, MN, NV, NY, PA, and WI), though many of those states have other kinds of mechanisms or regulatory processes to limit RPS costs.

Table of Contents

The Future Role & Impact of State RPS Programs Will Depend On…

- RPS compliance costs and ACPs/cost caps
- Legislative and legal challenges to state RPS programs, as well as changes to wholesale electricity market design
- Whether additional states decide to increase and extend RPS targets as they approach their final target year
- Other ongoing refinements (e.g., REC banking rules, long-term contracting programs, eligibility rules, etc.)
- The many related issues affecting RE deployment (integration, transmission, siting, net metering, etc.)

For Further Information

RPS reports, presentations, data files, resources

rps.lbl.gov

All renewable energy publications

emp.lbl.gov/reports/re

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