Renewable Energy Standards and Clean Energy Standards Overview

Jenny Sumner
Modeling & Analysis Group Manager
September 7, 2023

RPS and CES Overview

Renewable Portfolio Standard (RPS) Overview

- An RPS is a public policy tool requiring a certain amount of renewable electricity relative to the entire electricity supply.
- RPSs are an enforceable form of renewable energy targets (vs. a renewable “goal”)
- RPS policies are all unique: different motivations, target types, and technology approaches exist
- An RPS can set a share of energy demand (e.g. 20% of electricity supply) or a fixed amount of energy production or consumption (e.g. GW or GWh)

Source: Jenny Heeter, Bethany Speer, and Mark B. Glick. International Best Practices for Renewable Portfolio Standard (RPS) Policies. 2019. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20-72798. https://www.nrel.gov/docs/fy19osti72798.pdf.

Key RPS Design Elements

- Typically set as a production target (in MWh)
- Typically established on an annual basis with an end-year target
- Provide a list of eligible technologies
- Determine whether renewable imports are eligible
- Establish a compliance and enforcement structure

Table 2. Examples of Key Components of an RPS

Key Component	Example
Target	20% renewable electricity by 2050
Interim schedule	5% renewable electricity by 2020, 10% by 2030, 15% by 2040
Eligible resources	All solar photovoltaics, wind, biomass, and hydropower facilities less than 10 MW that began commercial operation on or after July 1, 2019
Compliance entities	All load-serving electricity companies with more than 50,000 customers
Regulatory entity	Public Utilities Commission
Penalties for noncompliance	$50/MWh

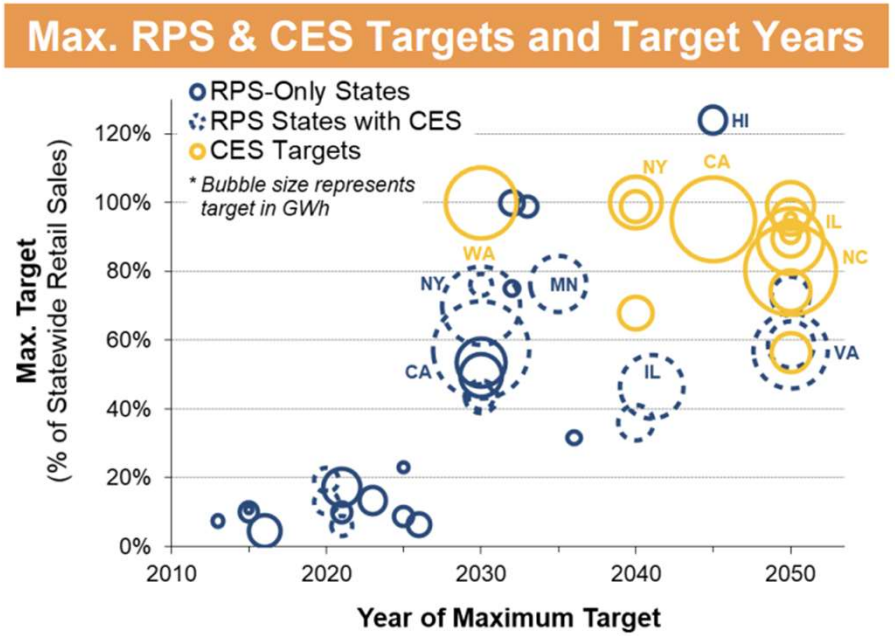
Source: Jenny Heeter, Bethany Speer, and Mark B. Glick. International Best Practices for Renewable Portfolio Standard (RPS) Policies. 2019. Golden, CO: National Renewable Energy Laboratory. NREL/TP-6A20-72798. https://www.nrel.gov/docs/fy19osti72798.pdf.

Clean Electricity Standards (CES) Overview

- A CES is similar to an RPS, but the includes a broader set of eligible resources
- Many states have not yet defined the implementation or enforcement mechanism for their CES policy
- CES adoption has accelerated in recent years, and states typically adopt a “100%” CES

Key CES Design Elements

- CES adoption is typically in combination with an RPS
- CESs typically focus on longer-term (2040-2050) targets
- CESs include higher percentage targets (80-100%) than RPSs

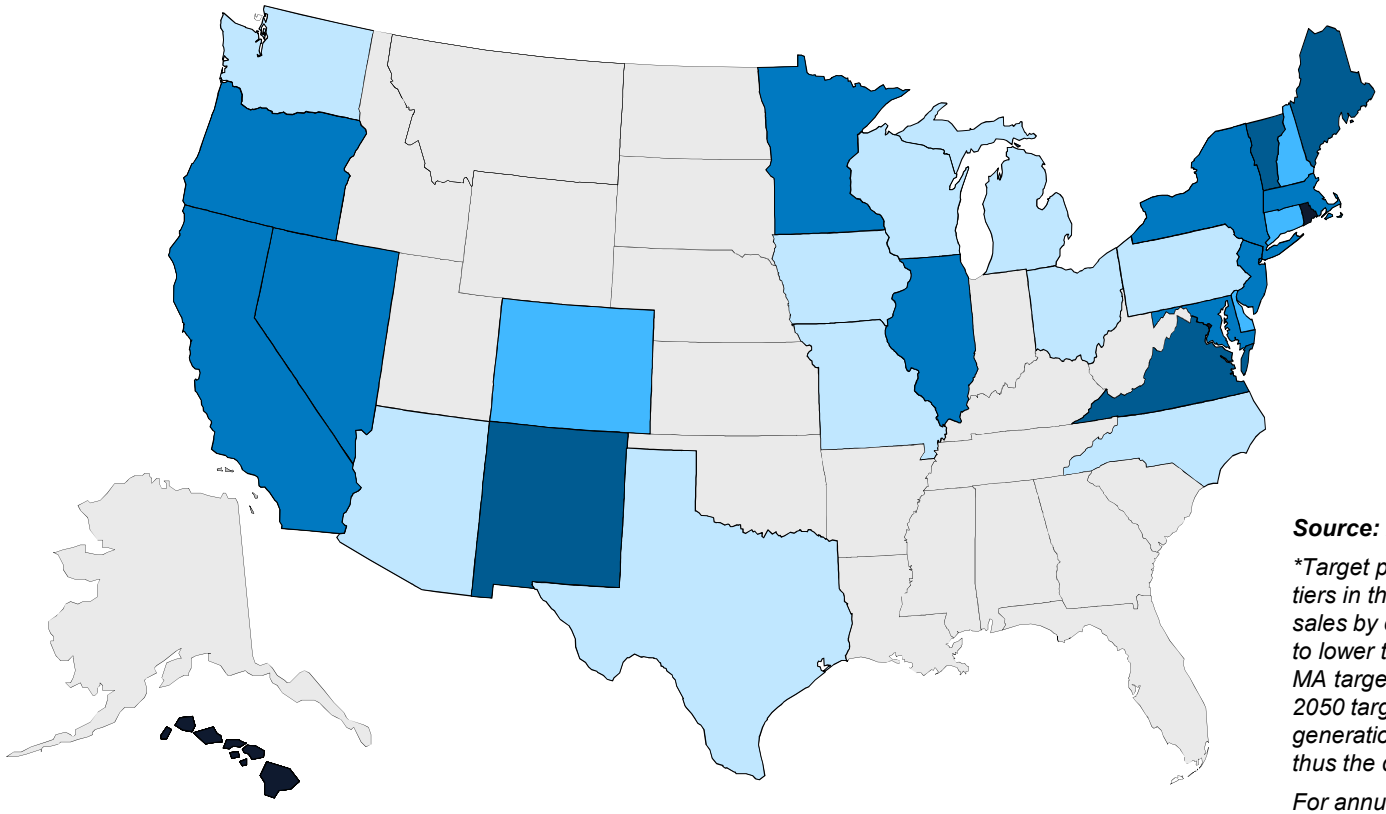


Notes: The figure shows each state's maximum RPS and CES percentage target and the associated year when that target must be reached. Targets are shown here as the percentage of total statewide retail sales, which may differ from nominal targets if those apply to only a subset of LSEs in a state. The RPS target for HI is denominated as a percent of total statewide generation, and thus is greater than 100% of retail sales. Bubble sizes represents the target in GWh terms; in the case of the CES targets, bubble sizes reflects only the incremental GWh above and beyond the RPS.

Source: https://eta-publications.lbl.gov/sites/default/files/lbnl_rps_ces_status_report_2023_edition.pdf

RPS and CES Policy Adoption

RPS Policies Exist in 29 States and DC
Apply to 58% of total U.S. retail electricity sales

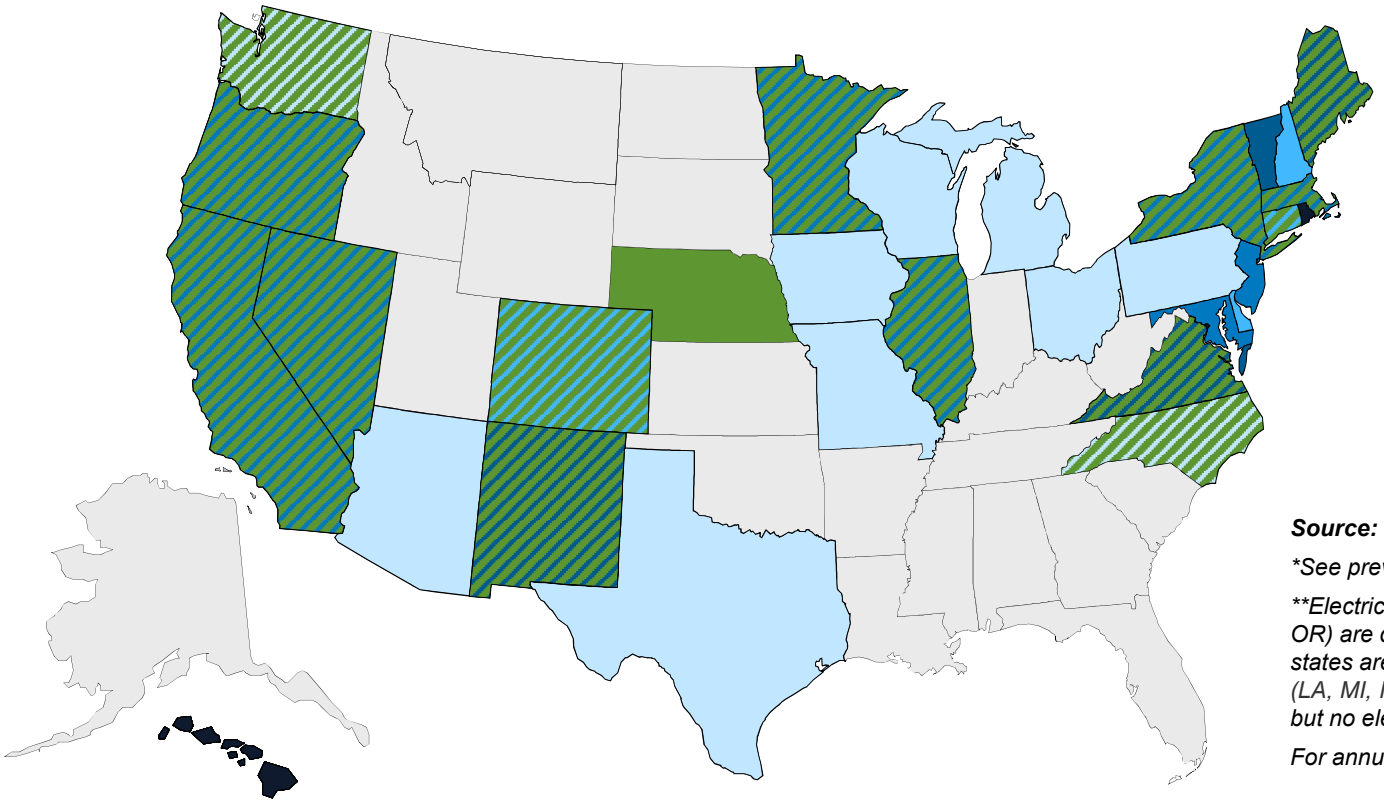


Source: Berkeley Lab *(June 2023)*

**Target percentages represent the sum total of all RPS resource tiers in the final target year, expressed as a percentage of retail sales by obligated LSEs. Some LSEs in each state may be subject to lower target percentages or exempt from the RPS altogether. The MA target escalates at 1% per year; the shading shown reflects the 2050 target level. The HI RPS is denominated as a percent of generation, and will ultimately rise to above 100% of retail sales; thus the darkest shade refers to 100%+.*

For annual RPS targets by state, see http://rps.lbl.gov

15 States Have Established a Broader 100% CES **
Typically in combination with an RPS



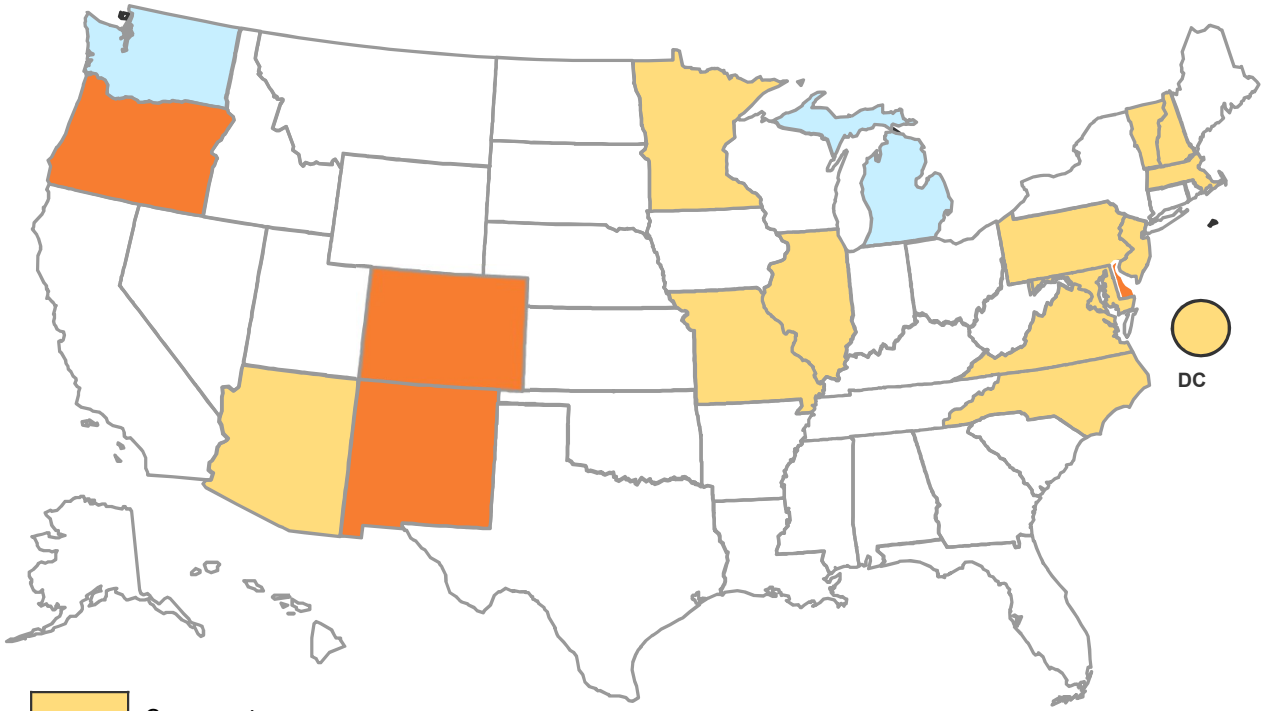
Source: Berkeley Lab *(June 2023)*

**See previous slide for notes on RPS targets*

***Electric sector emission standards in several states (CO, NC, NV, OR) are depicted here as a CES. Not included among the CES states are those that established a target only via executive order (LA, MI, NJ, WI) or with economy-wide emission reduction targets but no electric sector-specific targets (MD).*

For annual RPS & CES targets by state, see http://rps.lbl.gov

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

Data Source: https://eta-publications.lbl.gov/sites/default/files/rps_status_update-2021_early_release.pdf

RPS and CES Resources

- NREL RPS basics: https://www.nrel.gov/analysis/rps.html
- LBNL Status and Trends in RPSs and CESs: https://emp.lbl.gov/projects/renewables-portfolio/
- Clean Energy States Alliance 100% Clean Energy Collaborative: https://www.cesa.org/projects/100-clean-energy-collaborative/

Thank you

Jenny Sumner
Modeling and Analysis Group Manager
National Renewable Energy Laboratory
Jenny.Sumner@nrel.gov