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STATES OF POWER DECARBONIZATION

Q2 2024 Quarterly Report
Executive Summary



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The [NC Clean Energy Technology Center](#) is a UNC System-chartered Public Service Center administered by the College of Engineering at North Carolina State University. Its mission is to advance a sustainable energy economy by educating, demonstrating and providing support for clean energy technologies, practices, and policies. The Center provides service to the businesses and citizens of North Carolina and beyond relating to the development and adoption of clean energy technologies. Through its programs and activities, the Center envisions and seeks to promote the development and use of clean energy in ways that stimulate a sustainable economy while reducing dependence on foreign sources of energy and mitigating the environmental impacts of fossil fuel use.

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FULL REPORT AND OTHER 50 STATES REPORTS

The full Q1 2023 50 States of Power Decarbonization report may be downloaded [here](#). In addition to *The 50 States of Power Decarbonization*, the NC Clean Energy Technology Center publishes additional quarterly reports called *The 50 States of Solar*, *The 50 States of Grid Modernization*, and *The 50 States of Electric Vehicles*. These reports may be purchased [here](#). Executive summaries and older editions of these reports are available for download [here](#).

ABOUT THE REPORT

WHAT IS POWER DECARBONIZATION?

Decarbonization is an expansive term generally referring to the reduction of carbon dioxide emissions. Decarbonization can be discussed in the context of any emitting sector – electric power, buildings, industrial processes, transportation, agriculture, or the economy as a whole. This report focuses specifically on decarbonization of the electric power sector, which may include economy-wide decarbonization actions that necessarily encompass the electric power sector.

PURPOSE

The purpose of this report is to provide timely, accurate, and unbiased updates to a broad audience of state lawmakers and regulators, state agencies, utilities, the clean energy industry, and other energy stakeholders, about how states are choosing to study, adopt, implement, amend, or discontinue policies associated with power decarbonization and how utilities are planning for and implementing future generation resource additions and retirements. This report catalogues proposed and approved executive, legislative, and regulatory changes affecting electric power decarbonization during the most recent quarter, as well as actions related to investor-owned utility resource plans and generation capacity changes.

The 50 States of Power Decarbonization report series provides regular quarterly updates and annual summaries of electric power decarbonization policy updates and utility resource planning, keeping stakeholders informed and up to date.

APPROACH

The authors identified relevant policy changes and resource planning updates through state utility commission docket searches, legislative bill searches, popular press, and direct communications with industry stakeholders and regulators.

Questions Addressed

This report addresses several questions about U.S. electric power sector decarbonization, including:

- What targets are states setting for clean/renewable electricity generation or the reduction of greenhouse gas emissions from the power sector?
- How are states reforming statutes and regulations governing utility generation resource planning, procurement, and retirement?

- What electric generation capacity additions and retirements are utilities planning over the near-term and long-term?
- What specific electric generation capacity additions are utilities seeking to implement in the near-term through direct development or procurement processes? What resources are utilities requesting approval to retire in the near-term?

Actions Included

This report focuses on cataloguing and describing important proposed and adopted policy changes related to electric power sector decarbonization.

In general, this report considers an “action” to be a relevant (1) legislative bill that has been introduced, (2) an open or recently decided regulatory docket or rulemaking proceeding, (3) an executive order or significant state agency initiative, (4) a recently published integrated resource plan, or (5) a competitive procurement under development or underway for electric generation capacity. Primarily, statewide actions and those related to investor-owned utilities are included in this report. Specifically, actions tracked in this issue include:

Studies and Investigations

State- or utility-led efforts to study issues related to electric power decarbonization, including decarbonization pathways, cost impacts, and other specific topics.

Clean Energy Targets

New state clean energy standards, renewable portfolio standards, or technology-specific capacity targets, or changes to existing targets. Changes to implementation rules, such as eligible technologies and facility sizes, covered entities, and alternative compliance payment rates are also included.

Emission Targets and Carbon Policies

New state greenhouse gas emission reduction targets or modifications to existing targets. Changes to implementation rules for emission reduction targets are also included, as well as state or regional carbon pricing policies, such as carbon taxes or cap-and-trade programs.

Planning and Procurement Rules

Changes to rules governing the utility integrated resource planning process, as well as rules governing utility procurement of electric generation resources or retirement of existing utility-owned generation facilities.

Utility Integrated Resource Plans

Integrated resource plans recently filed by investor-owned utilities and actively under review by regulators, as well as utility efforts to develop an integrated resource plan in advance of filing the plan with regulators.

Generation Capacity Changes

Utility-initiated requests to build, acquire, convert, or retire generation facilities, as well as utility green tariffs for large customers and state- or utility-led competitive procurements for electric generation resources (excluding utility requests for approval of individual power purchase agreements and competitive procurements for unbundled renewable energy certificates).

Actions Excluded

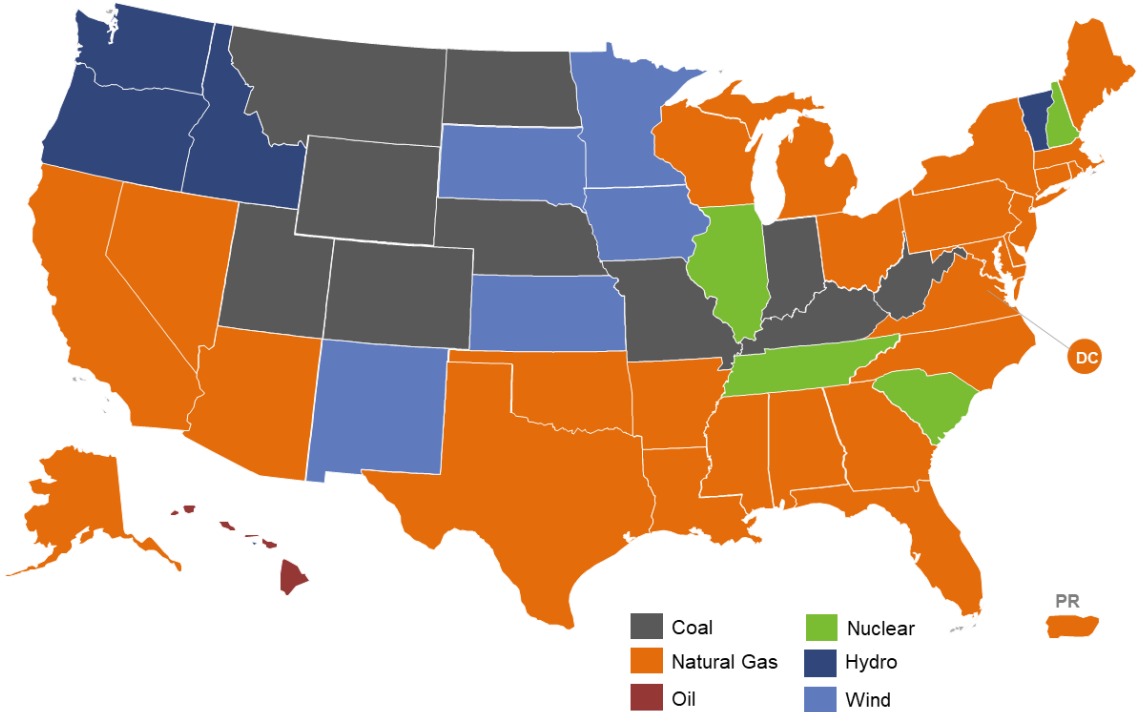
This report excludes actions that are specifically related to decarbonization of buildings, industrial processes, transportation, and agriculture. The report authors recognize that there are numerous important policy and regulatory issues related to clean energy project development that are highly relevant to overall electric power sector decarbonization. In order to maintain a well-defined scope of content, the report excludes actions specifically related to transmission and distribution planning, interconnection rules, and permitting and siting rules. Distribution system planning efforts are covered in the 50 States of Grid Modernization quarterly report, as well as a multitude of policies pertaining specifically to energy storage. Actions specific to distributed generation and community solar are covered in the 50 States of Solar quarterly report, and actions related to transportation electrification are covered in the 50 States of Electric Vehicles quarterly report. As noted above, utility requests for approval of individual power purchase agreements and competitive procurements for unbundled renewable energy certificates are excluded from this report.

DECARBONIZING THE U.S. ELECTRIC POWER SECTOR

The electric power sector in the U.S. is the second largest source of greenhouse gas emissions, behind the transportation sector, with a majority of its energy resources coming from fossil fuels. The industrial end-use sector is right behind it, followed by commercial and residential buildings. Together, these sectors account for approximately 90% of U.S. greenhouse gas emissions.* While the electric power sector itself accounts for 25% of emissions, efforts underway to electrify transportation, buildings, and industrial processes amplify the impact of decarbonizing the power sector.

Current federal government goals have the U.S. attaining a carbon pollution-free power sector by 2035 and a net-zero economy by 2050. As of now, 22 states have set clean or renewable energy standards or goals to reach net-zero emissions by 2050 at the latest. In addition, a plethora of electric utilities have announced net-zero or carbon neutrality goals for Scope 1, Scope 2 – and for some – Scope 3 emissions.†

Figure 1. Largest Contributing Resource to State Electric Generation Mix (2023)

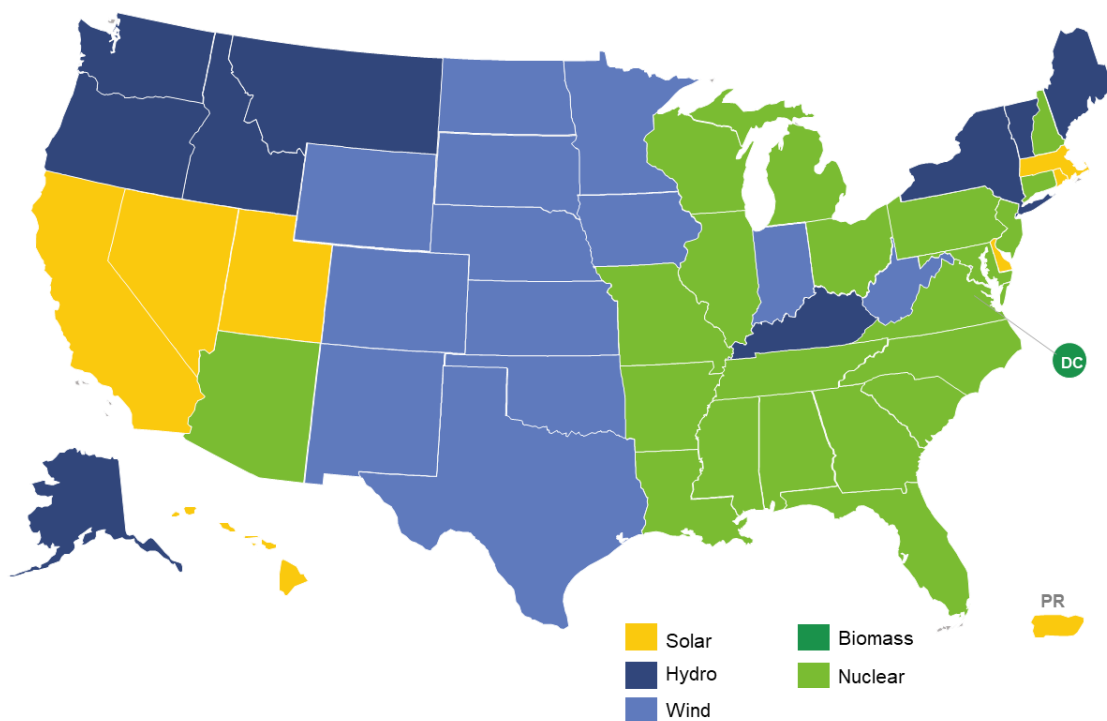


Data Source: U.S. Energy Information Administration – Electric Power Monthly, Net Generation by State by Type of Producer by Energy Source (Jan. – Dec. 2023).

* Environmental Protection Agency (EPA), *Sources of Greenhouse Gas Emissions*. EPA, May 2024, <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>.
 † Smart Electric Power Alliance (SEPA), *Utility Carbon-Reduction Tracker™*. SEPA, May 2024, <https://sepapower.org/utility-transformation-challenge/utility-carbon-reduction-tracker/#:~:text=100%25%20carbon%2Dfree%20electricity%20by%20the%20end%20of%202030.&text=Carbon%20neutral%20scope%201%20and%202%20emissions%20by%202030.&text=Net%2Dzero%20scope%201%20and%202%20emissions%20by%202040.&text=Net%2Dzero%20CO2%20emissions%20by%202045>.

However, most U.S. states and the country as a whole still have a long way to go to achieve these goals. Natural gas (43.1%) and coal (16.2%) remain two of the nation’s dominant electric generation resources, and either natural gas, coal, or oil makes up the largest share of electricity generation in 37 states (See Figure 1).[‡] Despite the current dominance of fossil fuels, clean energy is becoming a mainstay in the nation’s energy mix, particularly as costs decline and states acquire cleaner resources to meet climate and other environmental objectives.

Figure 2. Largest Contributing Clean Resource to State Electric Generation Mix (2023)



Data Source: U.S. Energy Information Administration – Electric Power Monthly, Net Generation by State by Type of Producer by Energy Source (Jan. – Dec. 2023).

Nationwide, clean energy resources are currently led by nuclear (18.6%), followed by wind (10.2%), hydropower (5.7%), and solar (3.9%).[§] Across the country, these resource mixes vary greatly, with different resources leading each state’s clean electricity generation; currently, most states’ clean energy portfolios are led by either nuclear or wind energy (see Figure 2). The overall contribution of clean energy sources to states’ electricity generation also varies widely, ranging from 5% to 99% in 2023 (see Figure 3).

Power decarbonization involves a wide range of potential pathways and technological solutions, allowing decision-makers to pursue a variety of combinations that, in theory, lead to the same

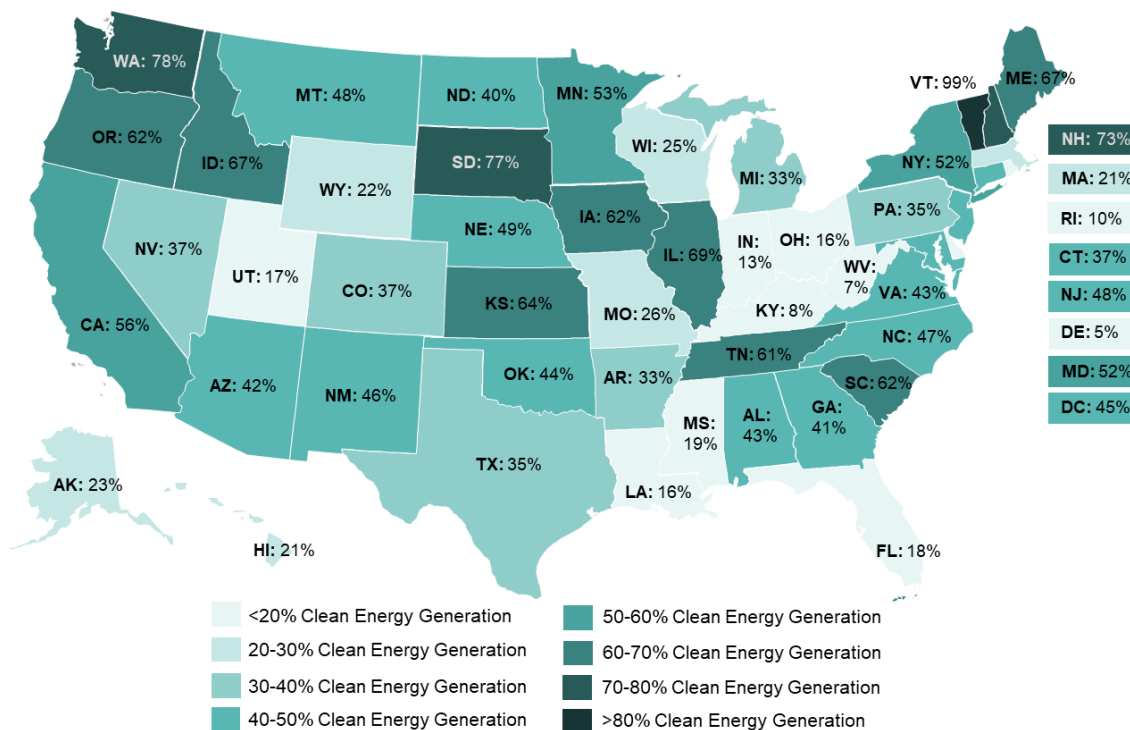
[‡] U.S. Energy Information Administration (EIA), *What is U.S. electricity generation by energy source?* U.S. EIA, February 2024, <https://www.eia.gov/tools/faqs/faq.php?id=427&t=3>. and U.S. EIA, *Electric Power Monthly, Net Generation by State by Type of Producer by Energy Source* (Jan. – Dec. 2023). <https://www.eia.gov/electricity/data/state/>.

[§] U.S. EIA, *What is U.S. electricity generation by energy source?* U.S. EIA, February 2024, <https://www.eia.gov/tools/faqs/faq.php?id=427&t=3>.

end goal. However, the cost of each pathway can vary dramatically, and challenges like global supply chains, transmission access, interconnection queues, and local permitting can impact the actual feasibility and timeline of each pathway. The timescale for implementation is a critical consideration for meeting climate goals, while cost is also highly important to minimize adverse economic impacts on individuals and businesses, particularly low-income households.

Another major factor influencing U.S. power decarbonization is the federal Inflation Reduction Act, signed into law in 2022. The Act includes significant incentives, including an array of tax credits and grants, for clean energy development and greenhouse gas emission reduction projects, upending the assumptions used in most existing technology deployment projections, cost-benefit analyses, and utility resource plans.

Figure 3. Percentage of Clean Electricity Generated by State (2023)



Data Source: U.S. Energy Information Administration – Electric Power Monthly, Net Generation by State by Type of Producer by Energy Source (Jan. – Dec. 2023). Map represents percent of total MWh generated in each state from clean energy sources (biomass, geothermal, hydroelectric, nuclear, solar, and wind).

Although there is much work to be done from where we currently stand to achieve state and utility power decarbonization goals, the future is looking bright. Power decarbonization is being actively considered by policymakers and regulators in nearly every state in the nation, and clean energy resources are dominating most states’ planned electric generation capacity additions in both the near-term and long-term. Meanwhile, states are working to create regulatory structures that will support the achievement of power decarbonization goals in the most fair and efficient ways.

EXECUTIVE SUMMARY

Q2 2024 POWER DECARBONIZATION ACTION

In the second quarter of 2024, 48 states plus DC and Puerto Rico took a total of 471 actions related to electric power decarbonization and resource planning. Table 1 provides a summary of state and utility actions on these topics. Of the 471 actions tracked, the most common were related to clean energy targets (107), electric generation capacity changes (100), and planning and procurement rules (97).

Table 1. Q2 2024 Summary of Grid Modernization Actions

Type of Action	# of Actions	% by Type	# of States
Clean Energy Targets	107	23%	23 + DC
Electric Generation Capacity Changes	100	21%	33 + PR
Planning and Procurement Rules	97	21%	32 + PR
Studies and Investigations	59	13%	24
Utility Integrated Resource Plans	57	12%	26 + PR
Emissions Targets & Carbon Policies	51	11%	19
Total	471	100%	48 States + DC, PR

Note: The "# of States/ Districts" total is not the sum of the rows because some states have multiple actions. Percentages are rounded and may not add up to 100%.

TOP 5 POWER DECARBONIZATION ACTIONS OF Q2 2024

Five of the quarter's top policy developments are highlighted below.

Vermont Lawmakers Set 100% Renewable Energy Standard

Vermont lawmakers enacted legislation in June 2024 increasing the state's renewable energy standard to 100% by 2030 for Green Mountain Power and by 2035 for other electric providers. The bill also includes new requirements pertaining to load growth, requiring certain percentages of new load to be met with renewable energy. The Governor vetoed the bill in May 2024, but the legislature overrode the veto.

Florida Legislators Ban Offshore Wind Development

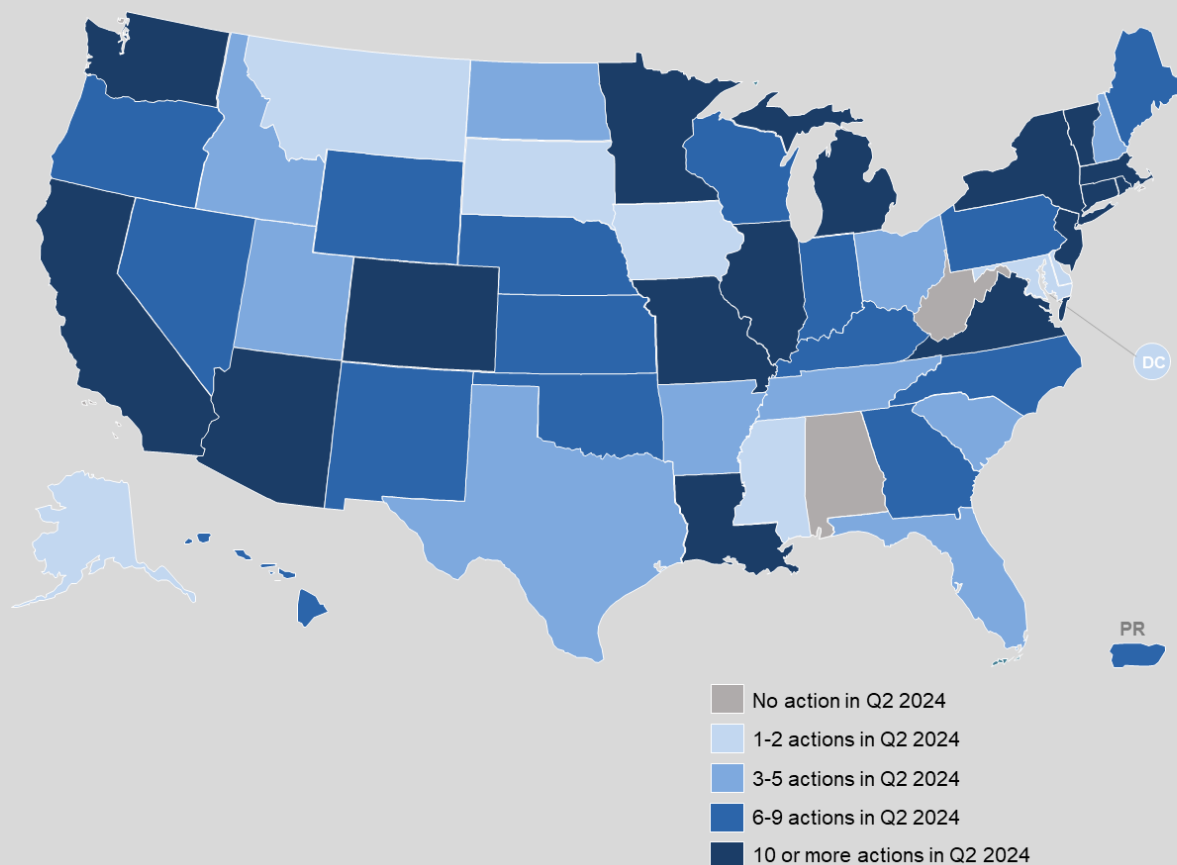
Florida legislators enacted a bill in May 2024 banning the construction or expansion of offshore wind energy facilities on a property within a mile of the state's coastline, the Atlantic Intracoastal Waterway, or Gulf Intracoastal Waterway. The bill also prohibits offshore wind

facilities on waters of the state and any submerged lands. Exceptions to this include turbines installed before July 2024 and any turbines attached to vessels solely for providing power to the vessel equipment.

NV Energy Files Clean Transition Tariff Proposal With Nevada Regulators

In May 2024, NV Energy filed an application for a new Clean Transition Tariff (CTT) with the Public Utilities Commission of Nevada, which would allow the utility to supply clean energy to its customers from dedicated resources at rates that do not impact other ratepayers. NV Energy also requested approval for an energy supply agreement, utilizing the CTT, with Google that would entail NV Energy purchasing electricity from a 115 MW enhanced geothermal project to sell to Google.

Figure 4. Q2 2024 Action on Power Decarbonization and Resource Planning



Delaware Lawmakers Pass Offshore Wind Target

Delaware lawmakers passed legislation during the quarter that directs the State Energy Office to develop and conduct one or more offshore wind solicitations to procure energy, capacity,

ancillary services, and/or renewable energy certificates from projects with an aggregate nameplate capacity of up to 1,200 MW. The bill allows for state-specific solicitations, as well as solicitations coordinated and combined with other states' procurement processes.

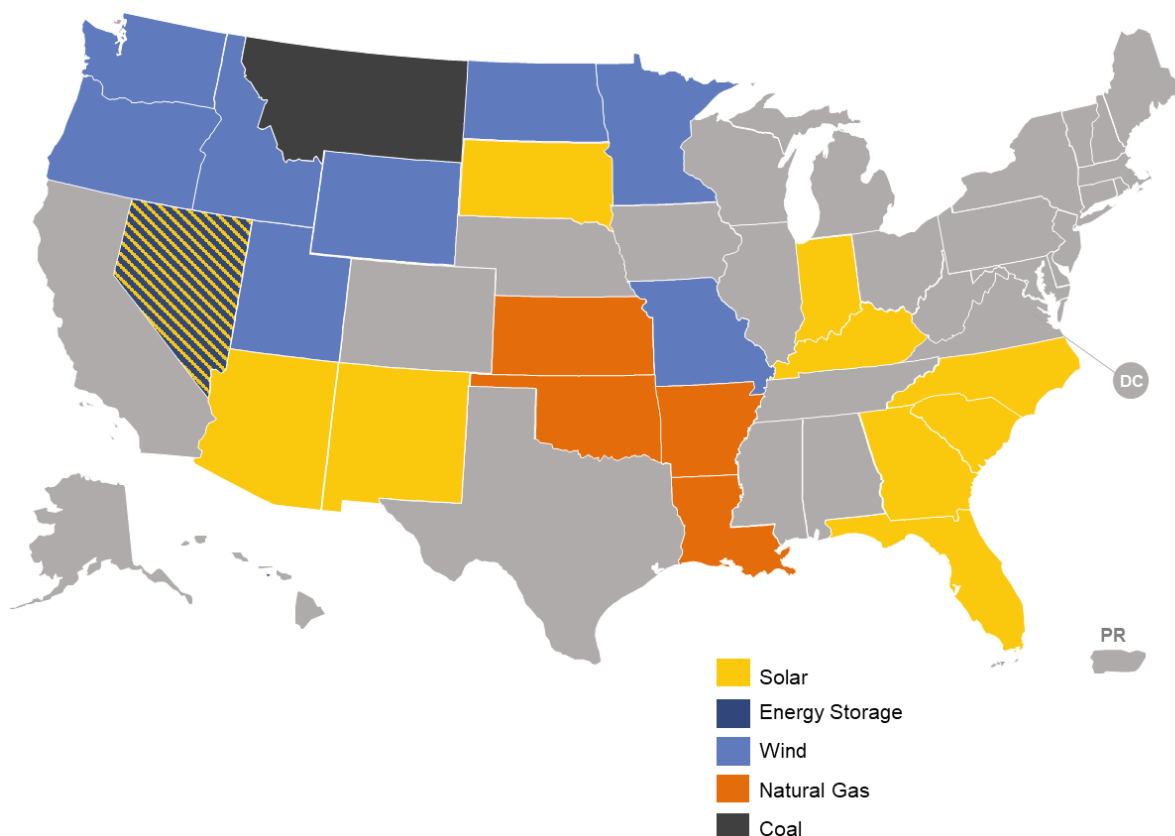
Kansas Legislature Adopts New Requirements for Plant Retirements

The Kansas Legislature enacted a bill in April 2024 adopting new requirements for the retirement of electric generation facilities. The legislation prohibits the Kansas Corporation Commission from approving retirements unless the utility demonstrates that it can meet current and future resource adequacy requirements. The plant retirement must also not be expected to harm customers or decrease the utility's regional rate competitiveness.

POWER DECARBONIZATION: LOOKING AHEAD

Although coal and natural gas currently account for the majority of U.S. electricity generation, solar and wind are making up the largest planned generation capacity additions for most utilities. Among integrated resource plans (IRPs) recently filed or under review by regulators in Q2 2024, planned capacity additions totaled 92,179 MW for solar, 49,773 MW for wind, 41,987 MW for natural gas, and 32,207 for storage, while planned coal retirements totaled 36,219 MW.

Figure 5. Q2 2024 Utility IRP Action, by Largest Planned Resource Addition



TOP POWER DECARBONIZATION TRENDS OF Q2 2024

Utilities Planning Future Clean, Dispatchable Generation Additions

Increasingly, utilities are including plans to add unspecified “clean, dispatchable” generation capacity within their integrated resource plans (IRPs). The most common example of this provided by utilities has been hydrogen-capable thermal plants. Evergy’s IRPs filed in Kansas and Missouri include thermal capacity additions modeled as natural gas-fired resources, but assumed to be “non-emitting firm, dispatchable resources” in 2035 and later. Ameren Missouri also includes plans to add significant clean dispatchable generation in the later years of its IRP planning horizon, while PacifiCorp included 5,385 MW of clean peaking resources in its updated IRP – assumed to be natural gas plants that are capable of operating with 100% hydrogen fuel. In the Upper Midwest, Xcel Energy also has plans to add firm peaking/dispatchable resources, described as hydrogen-capable natural gas generation.

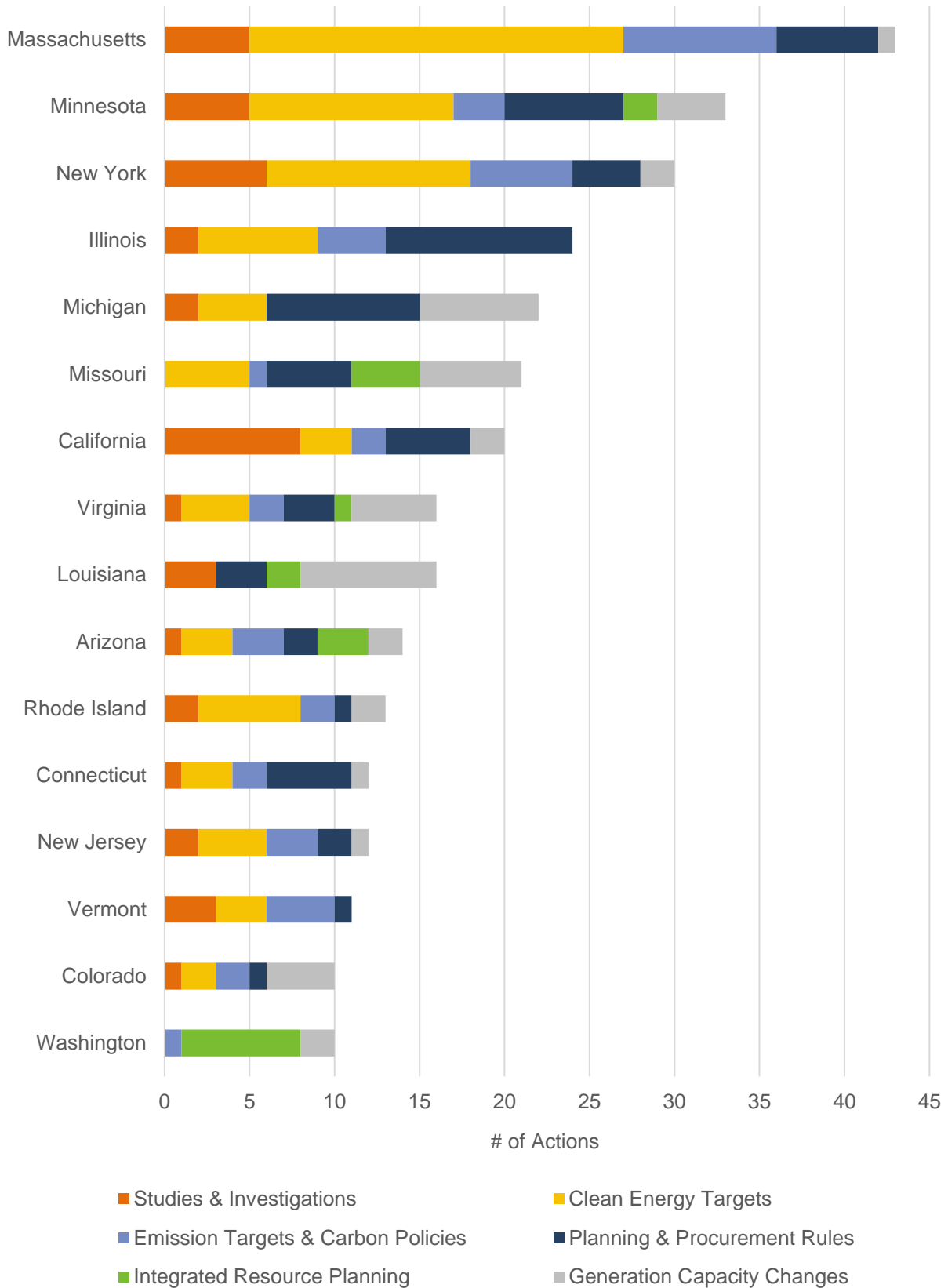
States Studying the Potential of Advanced Nuclear

A number of states are undertaking studies or investigations to understand the potential for advanced nuclear. In Florida, lawmakers enacted legislation in May 2024 directing the Public Service Commission to prepare a report with findings and recommendations for potential legislation and actions that could enhance the usage of advanced nuclear technologies. Kentucky legislators overrode the Governor’s veto of a bill that establishes a nuclear energy development authority tasked with providing information on advanced nuclear deployment opportunities. The authority is to undertake studies on advanced nuclear workforce needs and site suitability. In New Hampshire, lawmakers passed a bill regarding advanced nuclear energy studies, and regulators in Arizona, Louisiana, and Texas all have proceedings open to investigate issues around advanced nuclear.

States Advancing Procurement of Offshore Wind Energy

States – particularly those in the Northeast – continue to advance offshore wind energy in the U.S. through targets and competitive procurements. The New Jersey Board of Public Utilities opened the state’s fourth solicitation for offshore wind capacity in late April 2024, while New York launched its fifth solicitation in July. Meanwhile, Delaware lawmakers passed legislation calling for the procurement of up to 1,200 MW of offshore wind capacity, and Maryland legislators enacted a bill directing the Public Service Commission to initiate its second round of offshore wind procurement. In Maine, the Governor’s Energy Office released a request for information to solicit input from stakeholders and inform the state’s first commercial offshore wind solicitation. Recent solicitations have closed in Massachusetts and Rhode Island, with project selections anticipated soon. The California Energy Commission released its strategic plan for offshore wind energy development in June 2024, which establishes a maximum feasible offshore wind potential of 25 GW by 2045.

Figure 6. Most Active States of Q2 2024



FULL REPORT PRICING DETAILS

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