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STATES OF POWER DECARBONIZATION

Q3 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

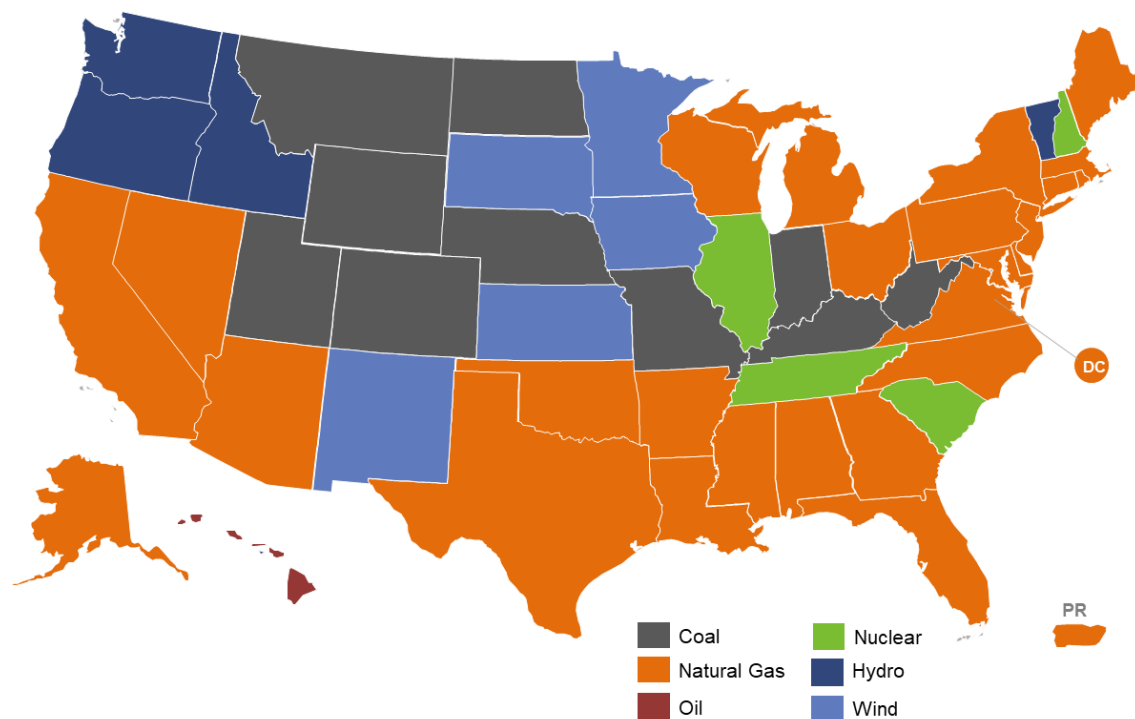
This report excludes actions that are specifically related to decarbonization of buildings, industrial processes, transportation, and agriculture. The report authors recognize that there are numerous important policy and regulatory issues related to clean energy project development that are highly relevant 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)



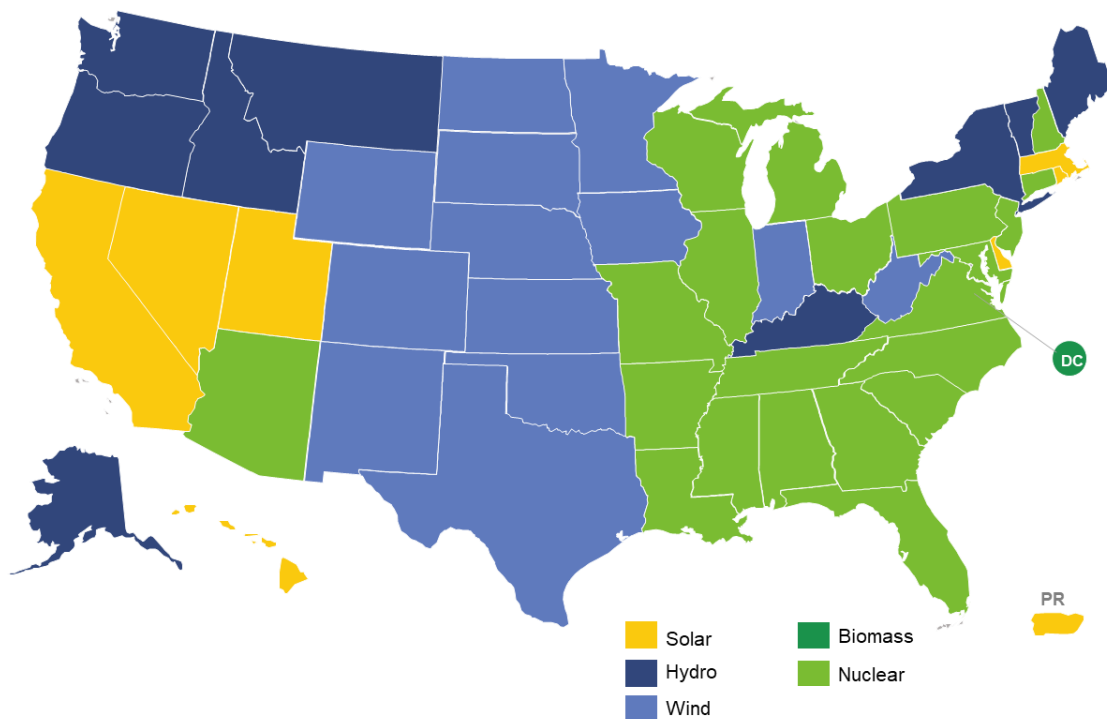
Data Source: U.S. Energy Information Administration – Electric Power Monthly, Net Generation by State by Type of Producer by Energy Source (Jan. – Dec. 2023).

* 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

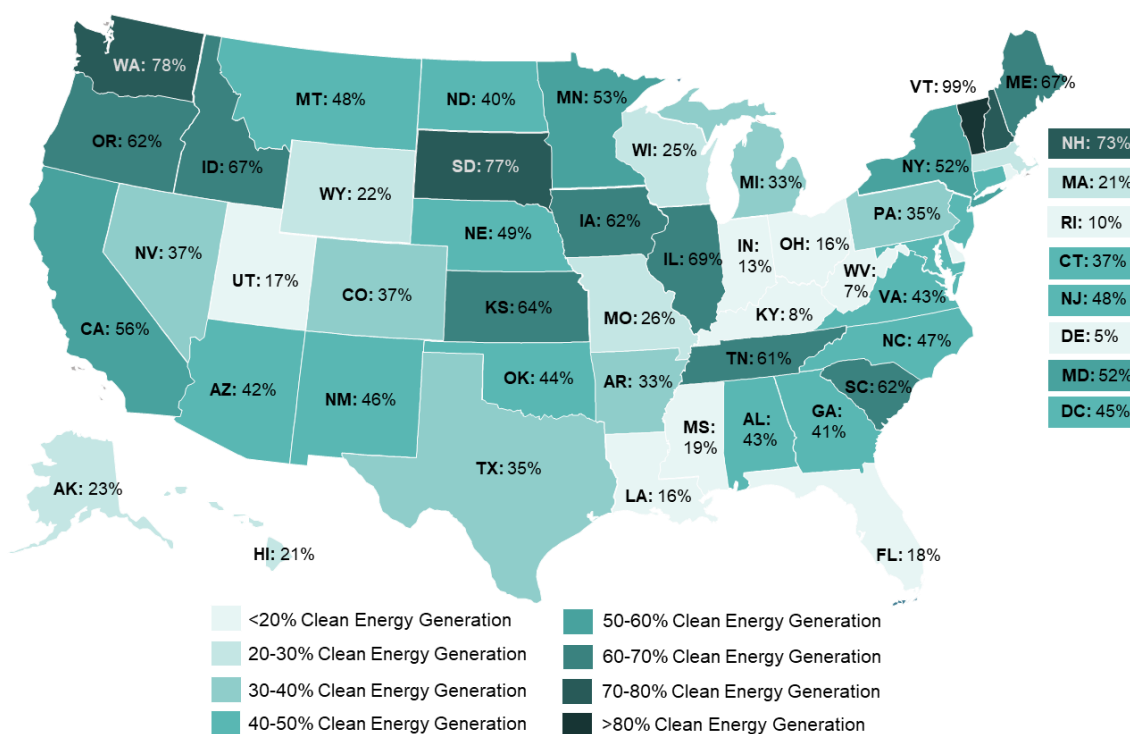
[‡] U.S. Energy Information Administration (EIA), *What is U.S. electricity generation by energy source?* U.S. EIA, February 2024, <https://www.eia.gov/tools/faqs/faq.php?id=427&t=3>. and U.S. EIA, *Electric Power Monthly, Net Generation by State by Type of Producer by Energy Source* (Jan. – Dec. 2023).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

Q3 2024 POWER DECARBONIZATION ACTION

In the third quarter of 2024, 47 states plus DC and Puerto Rico took a total of 344 actions related to electric power decarbonization and resource planning. Table 1 provides a summary of state and utility actions on these topics. Of the 344 actions tracked, the most common were related to electric generation capacity changes (98), clean energy targets (63), and planning and procurement rules (55).

Table 1. Q3 2024 Summary of Grid Modernization Actions

Type of Action	# of Actions	% by Type	# of States
Electric Generation Capacity Changes	98	28%	34 + PR
Clean Energy Targets	63	18%	18 + DC
Planning and Procurement Rules	55	16%	24 + PR
Utility Integrated Resource Plans	54	16%	24 + PR
Studies and Investigations	44	13%	19
Emissions Targets & Carbon Policies	30	9%	10
Total	344	100%	47 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 Q3 2024

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

Massachusetts Makes Offshore Wind Project Selections

The Massachusetts Department of Energy Resources completed its evaluation of offshore wind bids submitted in response to its RFP released last year. In September 2024, the Department announced its selections, which were coordinated with Rhode Island and Connecticut. Selected projects include 1,087 MW of the 1,287 MW Southcoast Wind project, up to 800 MW of the 1,200 MW Vineyard Wind 2 project, and all 791 MW of the New England Wind 1 project. The combined total capacity of selected projects is 2,678 MW.

Tennessee Valley Authority Releases Draft Integrated Resource Plan

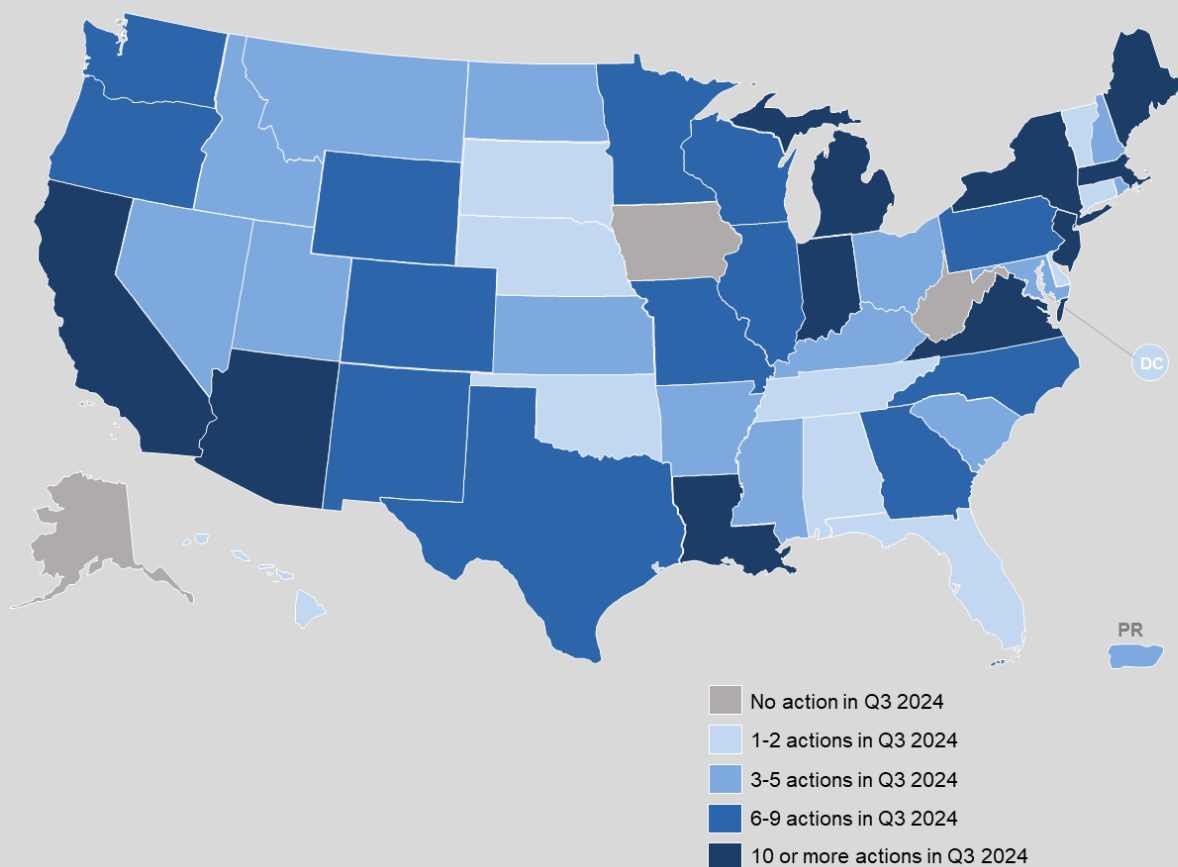
In September 2024, the Tennessee Valley Authority released its draft 2025 integrated resource plan, which includes plans to add 3 to 20 GW of solar, 4 to 19 GW of natural gas resources

(with potential for hydrogen blending and carbon capture and storage additions), up to 6 GW of battery storage, up to 4 GW of wind, 1 to 4 GW of demand response, and up to 1 GW of nuclear by 2035.

Utah Regulators Open Proceeding to Consider Treatment of New Large Loads

The Utah Public Service Commission opened a proceeding during Q3 2024 to investigate Rocky Mountain Power’s line extension rules in response to a number of complaints about the limitations, delays, and costs at the current practices impose on customers wishing to add new large loads. The proceeding will include consideration of Rocky Mountain Power’s proposed capacity reservation charge.

Figure 4. Q3 2024 Action on Power Decarbonization and Resource Planning



Colorado Department of Natural Resources Releases Geothermal and Hydrogen Studies

The Colorado Department of Natural Resources Energy and Carbon Management Commission released studies on geothermal resources and hydrogen regulation and

permitting in July 2024. The hydrogen study includes recommendations to improve permitting gaps, while the geothermal study includes recommendations for advancing the use of geothermal resources in the state.

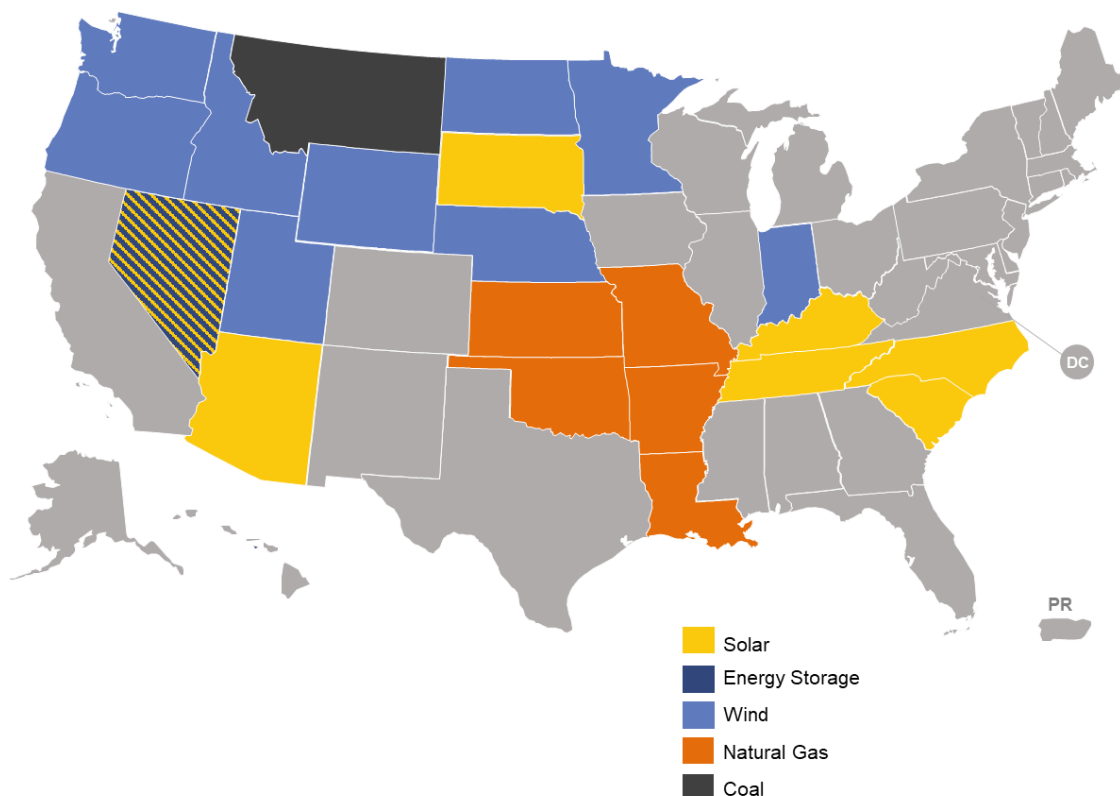
Parties Appeal Arizona Corporation Commission’s Approval of Gas Plant Expansion

In Arizona, the Attorney General’s Office, Sierra Club, and Western Resource Advocates filed appeals with the Maricopa County Superior Court regarding the Arizona Corporation Commission’s approval of UNS Electric’s proposed 200 MW expansion (comprised of four 50 MW units) of its Black Mountain natural gas combustion turbine plant. The Commission ordered that the four units are separate facilities and therefore do not meet the 100 MW threshold for requiring a Certificate of Environmental Compatibility.

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 Q3 2024, planned capacity additions totaled 65,803 MW for solar, 48,031 MW for wind, 47,745 MW for natural gas, and 26,958 for storage, while planned coal retirements totaled 35,068 MW.

Figure 5. Q3 2024 Utility IRP Action, by Largest Planned Resource Addition



TOP POWER DECARBONIZATION TRENDS OF Q3 2024

States Considering Treatment of New Large Load Customers

With electric load growth garnering attention across the country, a growing number of states are considering rules and requirements for serving new large load customers. In Ohio, regulators are considering AEP Ohio's application to establish new customer classes for data centers and special rules applicable to these customers. In Utah, the Public Service Commission opened a proceeding to evaluate Rocky Mountain Power's line extension rules for customers wishing to add new large loads. Meanwhile, Virginia's Joint Legislative Audit and Review Commission is studying the overall impacts of the data center industry in Virginia and state and local policies regarding the industry, including impacts on electricity demand and the ability of the state to achieve its renewable energy goals. The Virginia State Corporation Commission also opened a new proceeding on electric utilities and data center load growth in early October 2024.

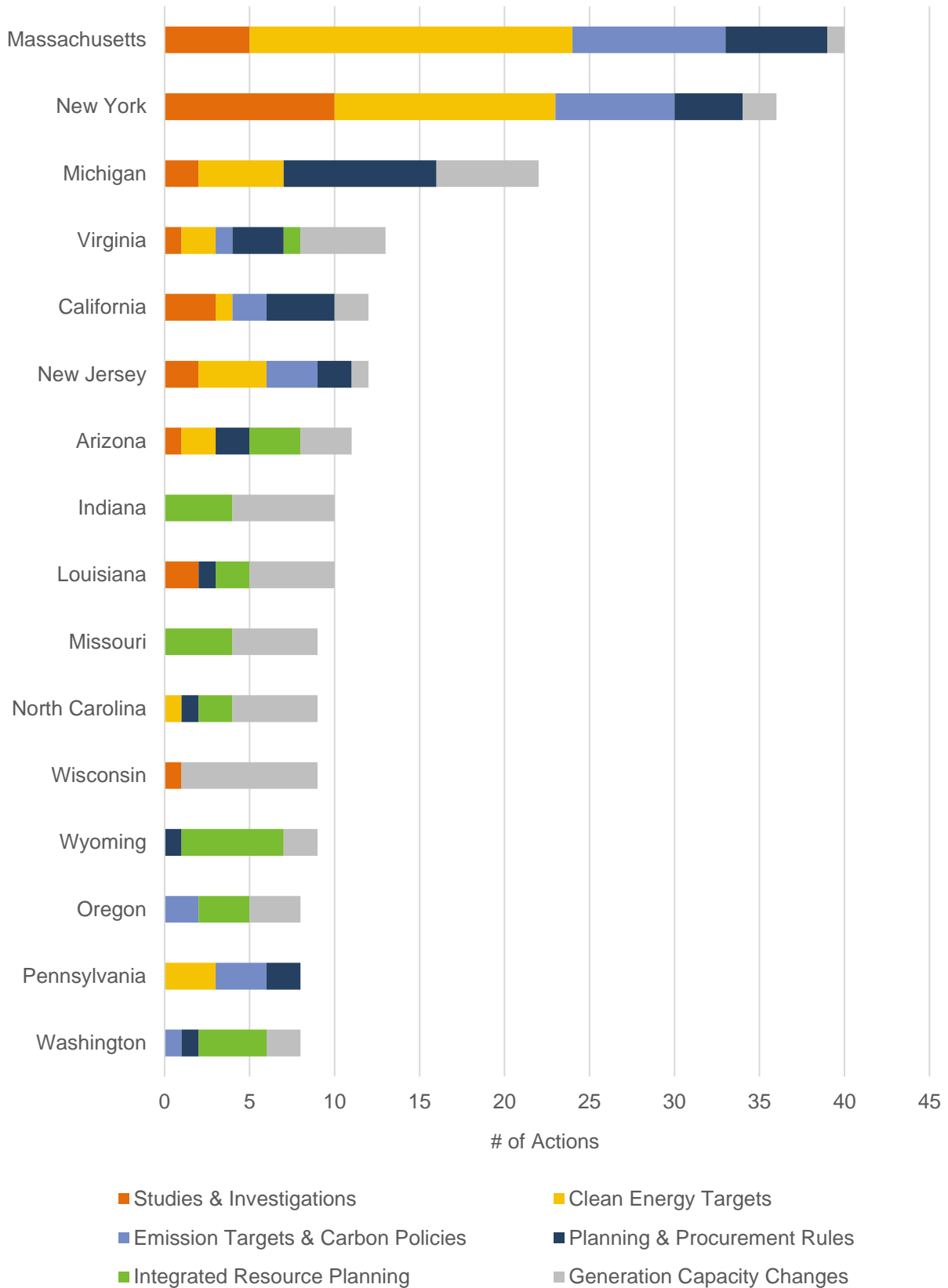
Utilities Pursuing Significant Natural Gas Capacity Additions

Utilities across the country are pursuing significant increases in natural gas-fired generation capacity. Some utilities' plans note that they intend to be able to use hydrogen fuel in these facilities or incorporate carbon capture and storage, but these plans typically have a long timeline for implementation. Utilities in Arizona, Missouri, North Carolina, Oklahoma, and Wisconsin recently filed applications to build, expand, or purchase natural gas-fired power plants. In integrated resource plans (IRPs), major natural gas capacity additions are also showing up across a large number of utilities. The Tennessee Valley Authority's draft IRP includes 4,000 to 19,000 MW of natural gas capacity additions, while Duke Energy's North Carolina carbon plan includes 8,925 MW of natural gas additions. Evergy has also included significant natural gas capacity additions in its IRPs spanning Missouri and Kansas, while Xcel Energy has included 3,889 MW of firm peaking resources in its Upper Midwest IRP. In Louisiana, SWEPCO has plans to add 3,360 MW of gas capacity, and Arizona Public Service is planning to add 3,034 MW of natural gas-fired generation.

Utilities Proposing Options for Large Customers to Purchase Nuclear Energy

Some utilities are beginning to propose new tariff options for large customers to purchase carbon-free electricity, which notably would include options for the purchase of nuclear power, as opposed to renewable energy only. In Virginia, Dominion Energy filed an application for approval of its new Carbon-Free or Renewable Generation Supply Service tariff, which would allow non-residential customers to purchase the net energy output from carbon-free or renewable energy resources in amounts up to 100% of their energy needs. Meanwhile, NV Energy filed an application with Nevada regulators for approval of a new Clean Transition Tariff. Similarly, earlier this year Duke Energy signed a memorandum of understanding with multiple companies to pursue a Clean Transition Tariff in North and South Carolina.

Figure 6. Most Active States of Q3 2024



FULL REPORT PRICING DETAILS

Full editions of the 50 States of Power Decarbonization are available for purchase [here](#) at a cost of \$500 for a single issue and \$1,500 for an annual subscription. A 20% subscription discount is available to non-profit, government, and education customers. An annual subscription to the 50 States of Power Decarbonization report can be added on to any other DSIRE Insight subscription (see options below) at a cost of \$1,200.

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