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STATES OF POWER DECARBONIZATION

Q2 2023 Quarterly Report
Executive Summary



NC CLEAN ENERGY
TECHNOLOGY CENTER

DSIRE insight

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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

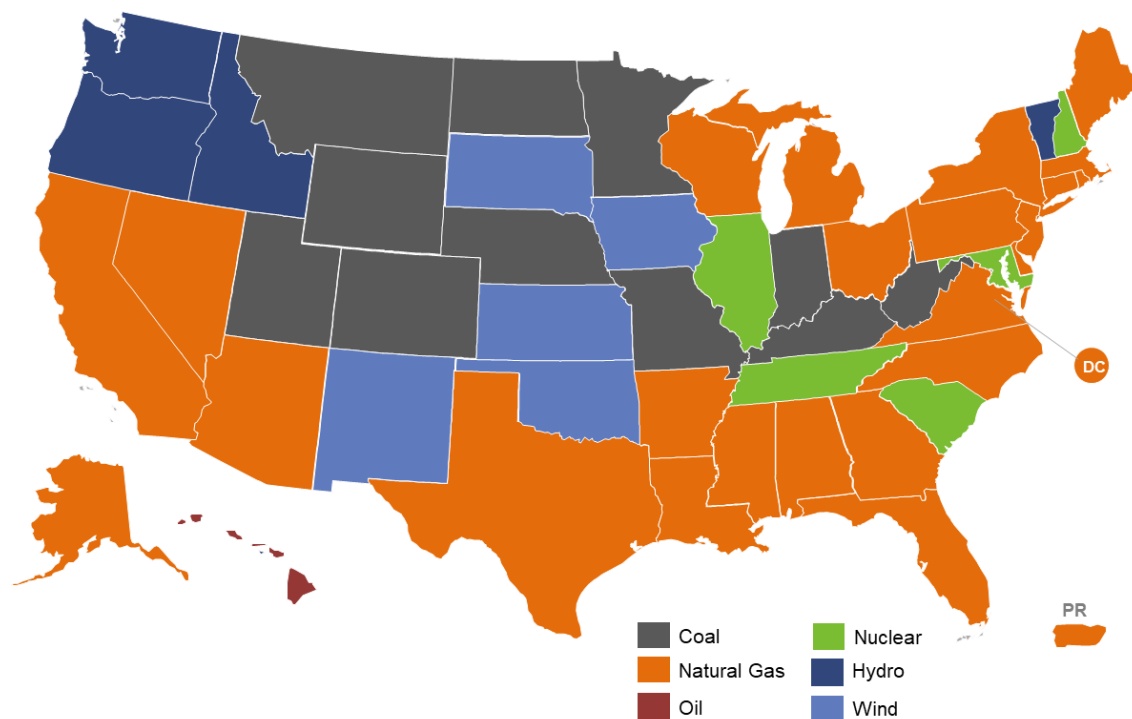
This report excludes actions that are specifically related to decarbonization of buildings, industrial processes, transportation, and agriculture. The report authors recognize that there are numerous important policy and regulatory issues related to clean energy project development that are highly relevant 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, 20 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 (2022)



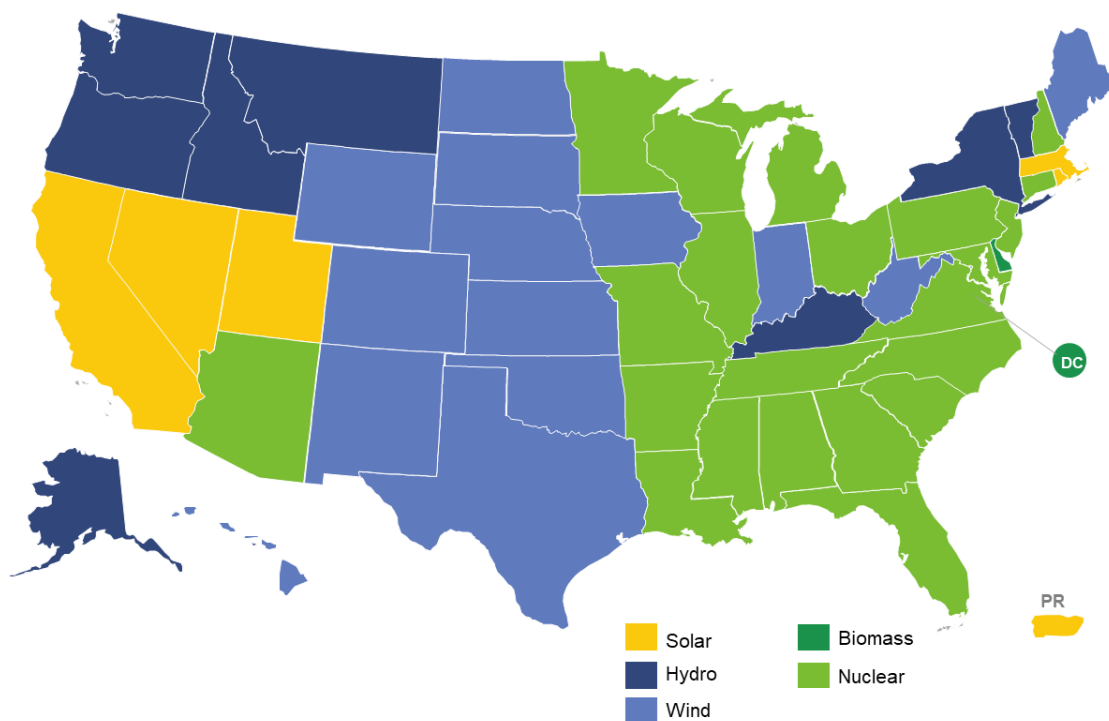
Data Source: U.S. Energy Information Administration – Electric Power Monthly, Net Generation by State by Type of Producer by Energy Source (Jan. – Dec. 2022).

* Environmental Protection Agency (EPA), *Sources of Greenhouse Gas Emissions*. EPA, May 2023, <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>.

† Smart Electric Power Alliance (SEPA), *Utility Carbon-Reduction Tracker™*. SEPA, May 2023, <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 (39.8%) and coal (19.5%) remain the nation’s dominant electric generation resources, and either natural gas, coal, or oil makes up the largest share of electricity generation in 36 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 (2022)



Data Source: U.S. Energy Information Administration – Electric Power Monthly, Net Generation by State by Type of Producer by Energy Source (Jan. – Dec. 2022).

Nationwide, clean energy resources are currently led by nuclear (18.2%), followed by wind (10.2%), hydropower (6.2%), and solar (3.4%).[§] 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 3% to 99% in 2022 (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

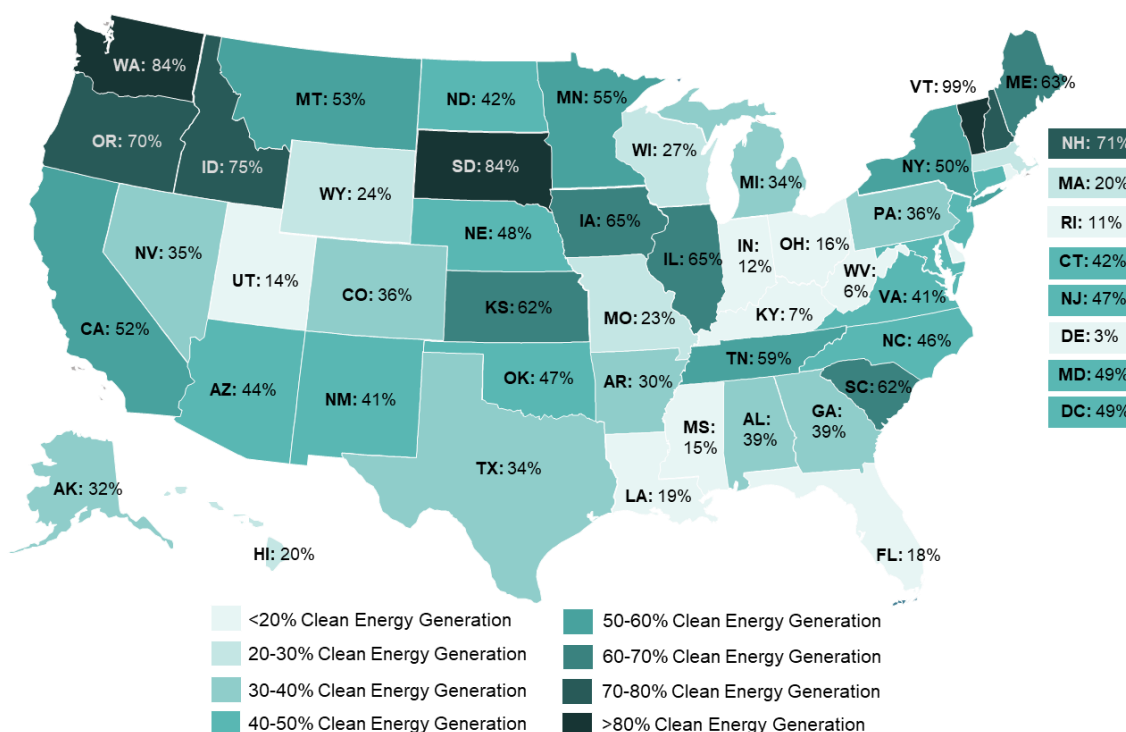
[‡] U.S. Energy Information Administration (EIA), *What is U.S. electricity generation by energy source?* U.S. EIA, February 2023, <https://www.eia.gov/tools/faqs/faq.php?id=427&t=3>. and U.S. EIA, *Electric Power Monthly, Net Generation by State by Type of Producer by Energy Source* (Jan. – Dec. 2022). <https://www.eia.gov/electricity/data/state/>.

[§] U.S. EIA, *What is U.S. electricity generation by energy source?* U.S. EIA, February 2023, <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 (2022)



Data Source: U.S. Energy Information Administration – Electric Power Monthly, Net Generation by State by Type of Producer by Energy Source (Jan. – Dec. 2022). 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 2023 POWER DECARBONIZATION ACTION

In the second quarter of 2023, 49 states plus Puerto Rico took a total of 438 actions related to electric power decarbonization and resource planning. Table 1 provides a summary of state and utility actions on these topics. Of the 438 actions tracked, the most common were related to clean energy targets (126), planning and procurement rules (89), and electric generation capacity changes (68).

Table 1. Q2 2023 Summary of Grid Modernization Actions

Type of Action	# of Actions	% by Type	# of States
Clean Energy Targets	126	29%	31
Planning and Procurement Rules	89	20%	33
Electric Generation Capacity Changes	68	16%	39 + PR
Utility Integrated Resource Plans	58	13%	27
Studies and Investigations	51	12%	22
Emissions Targets & Carbon Policies	46	11%	19
Total	438	100%	49 States + 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 2023

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

Maryland Lawmakers Increase Offshore Wind Deployment Target

Maryland lawmakers enacted legislation in April 2023, expanding the state’s target for offshore wind deployment. The legislation increases the target from 1,200 MW to 8,500 MW by 2031, giving Maryland the second largest offshore wind target in the country. The Maryland General Assembly also enacted legislation adopting an energy storage deployment target of 3,000 MW by 2033.

Colorado Legislators Adopt Greenhouse Gas Emission Reduction Targets

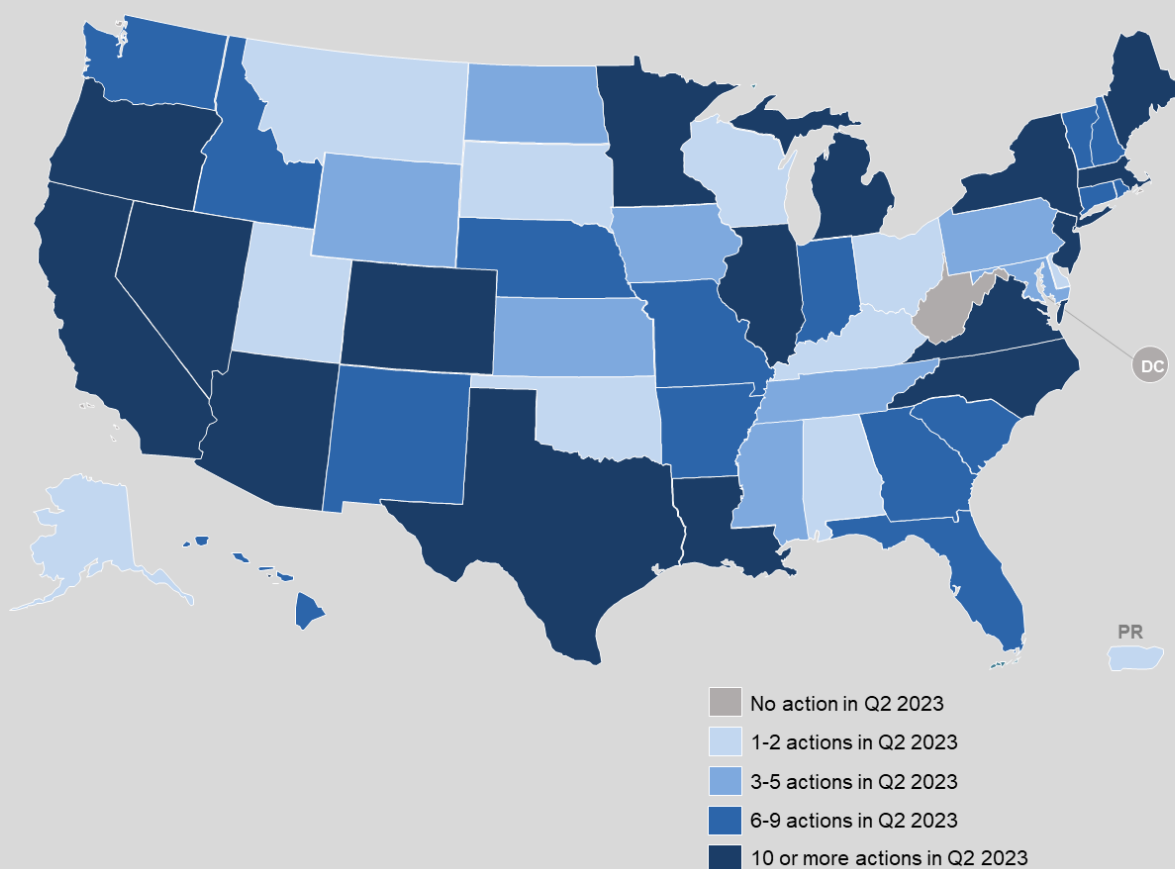
The Colorado General Assembly enacted bills establishing economy-wide and power sector targets for greenhouse gas emission reductions during Q2 2023. The legislation sets a 100% emission reduction target by 2050, with an initial interim reduction target of 65% by 2035. The

second bill sets an emission reduction target of 80% by 2030 for retail electric sales. The targets are all as compared to 2005 levels.

South Carolina Regulators Direct Dominion Energy to Develop a Competitive Procurement Program for Renewable Energy

The South Carolina Public Service Commission issued a directive in June 2023, finding that a Competitive Procurement of Renewable Energy Program is in the public interest for Dominion Energy. The directive requires the utility to initiate a stakeholder process to develop a CPRE program for its service territory and file a proposed program for consideration by March 30, 2024.

Figure 4. Q2 2023 Action on Power Decarbonization and Resource Planning



Connecticut Lawmakers Expand Renewable Energy Target to Include New Nuclear

Connecticut lawmakers enacted legislation in June 2023 expanding Class I resource eligibility under the state’s renewable portfolio standard to include new nuclear energy generation (facilities constructed on or after October 1, 2023). The bill also expands eligibility for certain

hydropower resources and establishes a council to discuss and plan for the advancement of nuclear energy in the state.

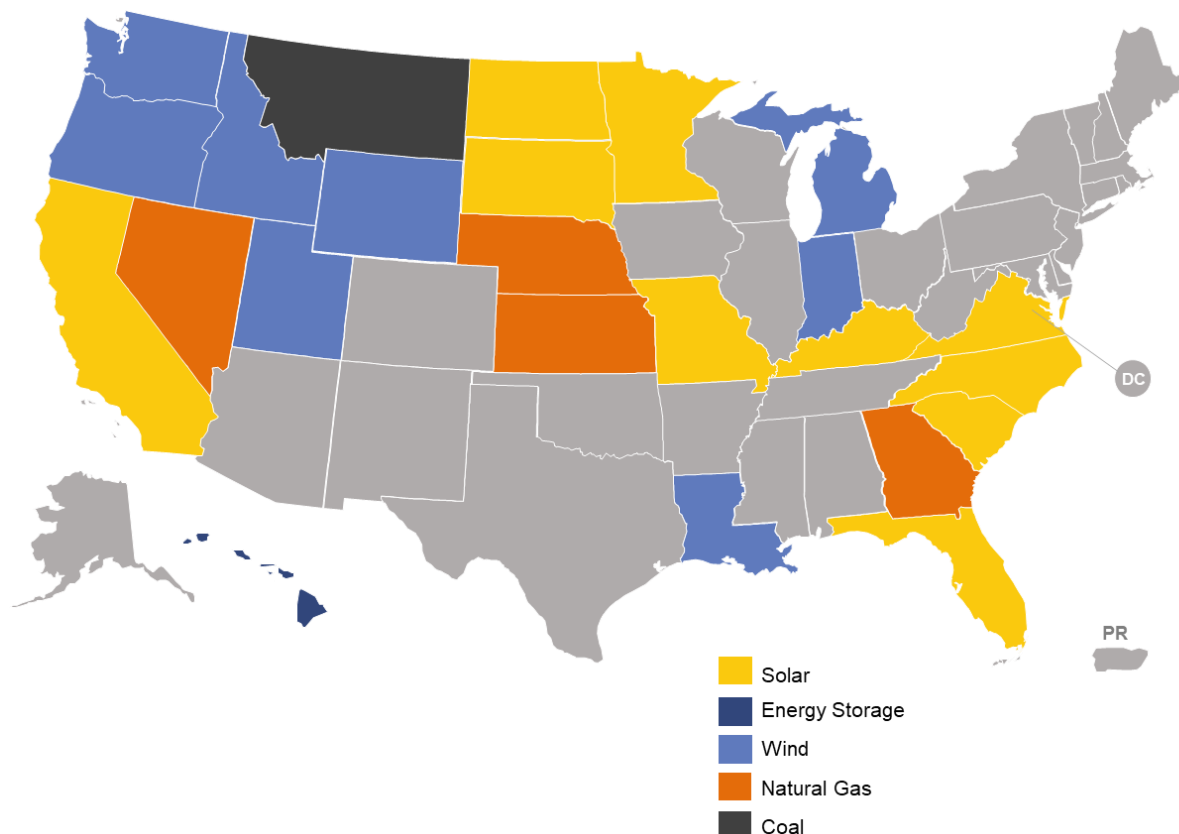
Florida Power & Light Plans Major Solar Capacity Additions in Ten-Year Site Plan

Florida Power & Light (FP&L) submitted its ten year power plant site plan to the Florida Public Service Commission in April 2023, which details the utility’s planned generation capacity additions through 2032. FP&L plans to add 19,966 MW of additional solar generation through 2032, as well as 2,000 MW of battery storage. At the end of 2022, the utility had a total of 3,611 MW of utility-owned solar generation and 120 MW of solar delivered under long-term power purchase agreements.

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 2023, planned capacity additions totaled 84,224 MW for solar, 47,400 MW for wind, 30,461 for storage, and 20,172 for natural gas, while planned coal retirements totaled 31,062 MW.

Figure 5. Q2 2023 Utility IRP Action, by Largest Planned Resource Addition



TOP POWER DECARBONIZATION TRENDS OF Q2 2023

State Lawmakers Promoting Offshore Wind Development

Lawmakers in several states took steps to promote offshore wind development during Q2 2023. In Maryland, legislators enacted a bill increasing the state's offshore wind deployment target to 8,500 MW, becoming the second largest target in the country. Virginia lawmakers enacted legislation moving up the timeline for achieving the state's existing offshore wind deployment target from the end of 2034 to the end of 2032. In Maine, state legislators passed a bill setting an offshore wind development goal of 3,000 MW by the end of 2040. The legislation calls for the Governor's Energy Office to conduct a competitive solicitation for projects. Legislation passed in Illinois calls for a study to evaluate several energy policy proposals, including a pilot to establish an offshore wind project.

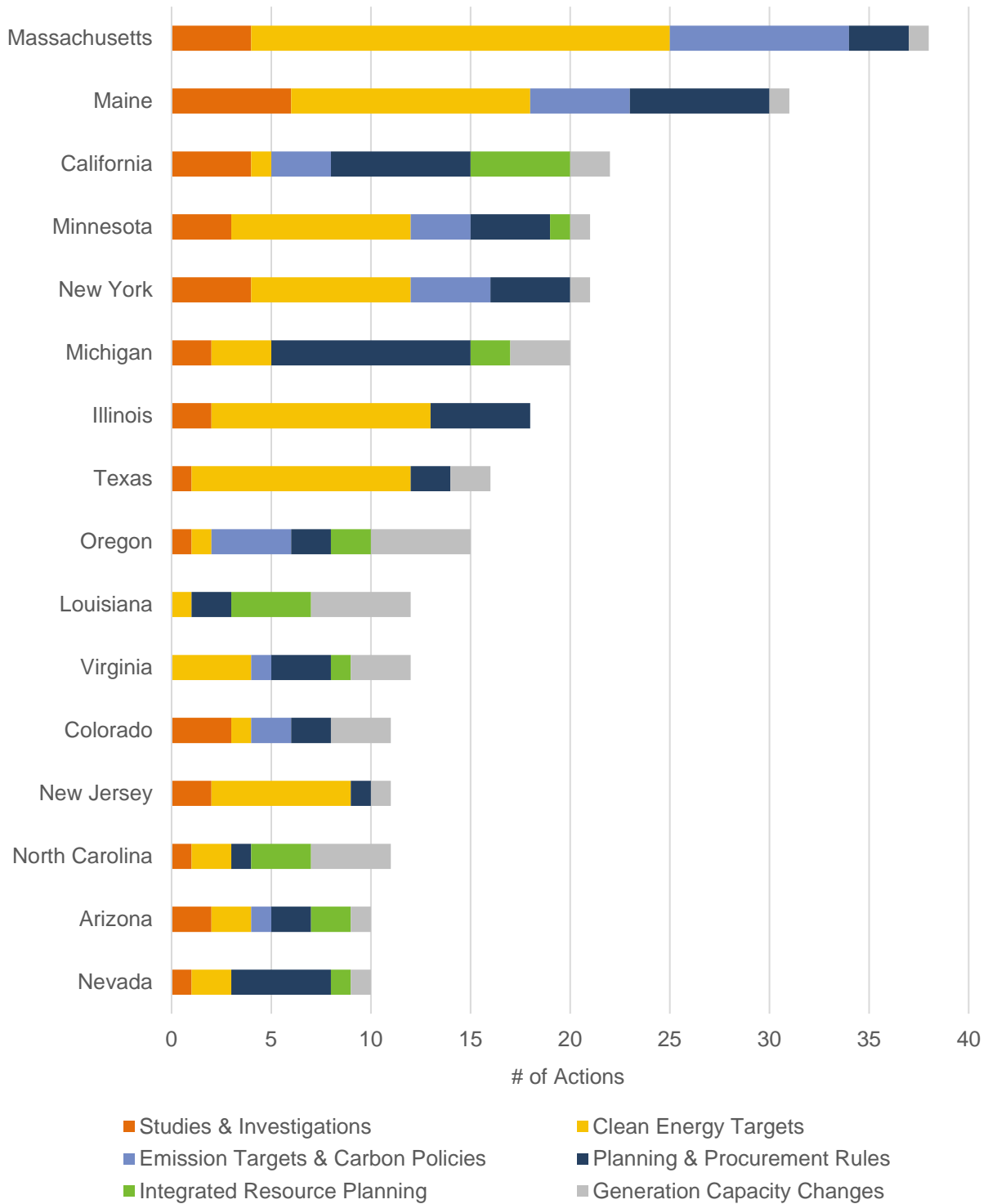
Policymakers Modifying Resources Eligible for Compliance with Clean and Renewable Energy Targets

Policymakers in a number of states across the country with existing clean or renewable energy targets considered modifications to the resources eligible for compliance with these standards during Q2 2023. Most of these adjustments relate to eligibility for biomass, hydropower, hydrogen, and nuclear energy resources. Connecticut lawmakers enacted legislation in June 2023 redefining the types of hydropower facilities eligible for compliance and including nuclear energy facilities constructed on or after October 1, 2023 as eligible resources. Legislation passed in Illinois allows hydropower to be used for renewable portfolio standard compliance, while a bill enacted in Colorado expands the definition of clean heat resource to include wastewater thermal energy. While Arkansas does not have a renewable portfolio standard, state lawmakers enacted a bill defining bioenergy produced from biomass as renewable.

States Investigating the Feasibility of Advanced Nuclear for Power Decarbonization

Several states are examining the feasibility of nuclear energy to contribute to decarbonization of the power sector. The majority of these investigations are focused on advanced nuclear technologies, including small modular reactors. The Arizona Corporation Commission opened a proceeding in June 2023 to examine the feasibility, viability, and sustainability of advanced nuclear power generation. In Michigan, the Public Service Commission opened a proceeding to conduct a study on the feasibility of nuclear power generation in the state, pursuant to legislation enacted last year. Colorado lawmakers enacted legislation directing the Colorado Energy Office to conduct a study of advanced energy solution technologies, including advanced nuclear. Legislation enacted in Connecticut establishes the Connecticut Council for Advancing Nuclear Energy Development and requires the Department of Energy and Environmental Protection to conduct a study on the feasibility of small modular reactors, advanced nuclear reactors, and fusion energy facilities.

Figure 6. Most Active States of Q2 2023



FULL REPORT PRICING DETAILS

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