Reconsidering the Renewable Bias in Energy Portfolio Standards

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I. INTRODUCTION

Deploying advanced nuclear and carbon capture and sequestration (CCS) technologies at scale is essential to emissions reduction and decarbonizing the U.S. economy consistent with the Paris Agreement.[1] A recent Intergovernmental Panel on Climate Change (IPCC) report found that "growth in the share of energy derived from low-carbon-emitting sources (including renewables, nuclear and fossil fuel with CCS)" is consistent across all 1.5-degree mitigation pathways assessed.[2] Meeting these targets could require doubling nuclear generation globally by 2050,

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1. James H. Williams, et al., Pathways to Deep Decarbonization in the United States 16-20 (2014).

2. Joeri Rogelj, et al., Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development, in Special Report on Global Warming of 1.5°C 93, 130 (Valérie Masson-Delmotte, et al., eds., Intergovernmental Panel on Climate Change [IPCC] 2018).

in addition to industrial uses of micronuclear and modular reactors[3] and storage of up to 300 gigatons of carbon dioxide ($GtCO_2$) through carbon capture, utilization, and storage technology (CCUS) by 2050.[4] The increase of net zero electrification necessary to meet Paris Agreement commitments will not be possible without these technologies.[5]

These stark realities have inspired ambitious action worldwide to advance nuclear and CCUS to meet the ambitious emissions reduction goals of the Paris Agreement. The outcome of the first global stocktake, agreed to by all parties to the Paris Agreement following the twenty-eighth Council of the Parties (COP28) in Dubai, called on parties to "accelerate zero and low emissions technologies," specifically noting the need for nuclear and carbon capture and utilization and storage.[6] Prior to this statement, CCUS and nuclear were already core to numerous national level emissions reductions strategies. In 2022, the Clean Air Task Force found that carbon capture, nuclear, and hydrogen featured prominently in national plans to meet climate goals.[7] Since then, the importance of nuclear, hydrogen, and CCUS to mitigation pathways has only increased. In fact, during COP28, the United States joined numerous other countries in a pledge to triple nuclear energy globally by 2050.[8] At COP29, the U.S. committed to a strategy for achieving this goal within the United States by deploying two hundred gigawatts (GW) of new nuclear generation domestically by 2050.[9]

While many of the developments in nuclear and CCUS are likely to occur globally, these technologies are also forecasted to expand in the United States. The Fifth National Climate Assessment, released in fall of

3. Emma Derr, How is Nuclear a Solution to the IPCC's Latest Findings, Nuclear Energy Inst. (Apr. 2022), https://www.nei.org/news/2022/how-is-nuclear-a-solution-to-ippcs-latest-findings.

4. IPCC, *supra* note 2, at 97.

5. INT'L ENERGY AGENCY [IEA], NET ZERO BY 2050: A ROADMAP FOR THE GLOBAL ENERGY SECTOR 14-16 (2021).

6. U.N. Framework Convention on Climate Change, *First Global Stocktake Proposal by the President: Draft Decision*, ¶ 28(e), U.N. Doc. FCCC/PA/CMA/2023/L.17 (Dec. 13, 2023).

7. Stacey Davis, *NDC Snapshot: Advanced Low-Emission Energy and Climate Technologies in National Climate Commitments*, CLEAN AIR TASK FORCE (Apr. 28, 2022).

8. *At COP28, Countries Launch Declaration to Triple Nuclear Energy Capacity by 2050, Recognizing the Key Role of Nuclear Energy in Reaching Net Zero*, U.S. DEP'T OF ENERGY (Dec. 1, 2023), https://www.energy.gov/articles/cop28-countries-launch-declaration-triple-nuclear-energy-capacity-2050-recognizing-key; U.N. Framework Convention on Climate Change, *supra* note 6.

9. THE WHITE HOUSE, SAFELY AND RESPONSIBLY EXPANDING U.S. NUCLEAR ENERGY: DEPLOYMENT TARGETS AND A FRAMEWORK FOR ACTION 4 (Nov. 2024), https://www.whitehouse.gov/wp-content/uploads/2024/11/US-Nuclear-Energy-Deployment-Framework.pdf.

2023, found that "most US net-zero scenarios require CO_2 removal from the atmosphere to balance residual emissions, particularly from sectors where decarbonization is difficult."[10] The "very-low" scenario, which reflects the greatest reduction in global greenhouse gas emissions, would also require a shift towards nuclear.[11] Consistent with these objectives, Congress has created numerous new incentive programs to support and encourage nuclear and CCS. These include the expansion or creation of tax credits for carbon sequestration like 45Q, production tax credits for new clean electricity generation, and Department of Energy demonstration projects and loan programs.[12]

The success of these policies will depend on political cooperation and alignment among states to ensure the development of zero carbon energy generation facilities and supporting infrastructure. Energy-producing states throughout the country have risen to the challenge. The legislatures in these states have moved to enable and encourage the development of zero emissions and decarbonization technologies such as advanced nuclear and CCUS. These efforts align with federal clean energy programs that endeavor to drive clean energy investments for transitioning coal mine and power plant communities and provide additional incentives for developing new carbon-free projects in these areas.[13] Together, federal policies and those of energy-producing states support a just transition that enables workforce and economic transitions in regions with extractive dependent economies and mutualizes national and local interests in the expansion of zero carbon energy resources.

Yet ambitions for the growth of CCS and nuclear may be at odds with state-level energy market regulations in major energy-consuming states. Although approximately two-thirds of states anticipate using nuclear energy in some form to replace fossil fuels,[14] many have passed legislation or policies that close off portions of the electricity market to non-renewable resources, including both nuclear and coal or gas generation with CCS. These laws give preference to renewable generation

10. Alexa K. Jay, et al., *Overview: Understanding Risks, Impacts, and Responses*, FIFTH NATIONAL CLIMATE ASSESSMENT (2023), https://doi.org/10.7930/NCA5.2023.CH1.

11. C.W. Avery, et al., *Front Matter*, FIFTH NATIONAL CLIMATE ASSESSMENT (2023), https://doi.org/10.7930/NCA5.2023.CH1.

12. *See* Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, § 80402, 135 Stat. 429, 1331-34 (2021); Inflation Reduction Act of 2022, Pub. L. No. 117-169, 136 Stat. 1818, 1906-1931 (2022).

13. *Id.*

14. Jennifer McDermott, *Majority of US States Pursue Nuclear Power for Emissions Cuts*, ASSOCIATED PRESS (Jan. 18, 2022), https://apnews.com/article/climate-technology-business-nuclear-power-environment-and- nature-cfb21ab68a9e7005cc08873f2a5a7031.

over other zero carbon energy resources. Due to the interstate nature of most electricity systems, these laws may impact generation planning in states beyond their borders, creating geographic distortions that could counteract broad decarbonization goals.[15]

This Article argues that revising state electricity market regulations to become technology-neutral is the most rapid and affordable way to achieve emissions reductions and net zero goals. While energy-producing states have progressively adopted policies to support the development of CCS and nuclear projects, these efforts do not align with several state-level energy portfolio standards that exclusively favor renewable sources. Such state policies are similarly out of sync with federal incentives, procurement rules, and the EPA's new regulations under Section 111 of the Clean Air Act. The authors argue that clean energy standards—focused on lowering the carbon intensity of the energy sector without favoring specific generation methods—provide a better option that can accelerate decarbonization, reduce costs for consumers, and give energy-producing states more flexibility in managing the tradeoffs of energy production.

II. RED STATES, CLEAN ENERGY

State laws are a critical part of energy governance. While federal agencies such as the Nuclear Regulatory Commission (NRC) and Environmental Protection Agency (EPA) have regulatory authority over permitting key aspects of nuclear and CCS, state laws and policies can either encourage or thwart development within the state. Among the enabling policy options available, state legislatures can enact rules addressing liability, provide state grants to projects, establish tax incentives, provide low-cost financing, or authorize rate recovery through public utility regulatory bodies.[16] Just as easily, states can discourage the development of generation facilities through bans or moratoria, strict-liability statutes, or tax policy. Contemporaneous with federal policies

15. Jacques A. de Chalendar, et al., *Tracking Emissions in the US Electricity System*, 116 PNAS 25497, 25501 (Dec. 17, 2019) ("Of the 265 Mt of CO2 that were emitted to the atmosphere when generating electricity in 2016 in the western grid, the interconnection where trade is the most relevant, 17% were emitted to satisfy electrical consumption in a different region.").

16. *See generally* NUCLEAR ENERGY INST., STATE LEGISLATION AND REGULATIONS SUPPORTING NUCLEAR ENERGY (2024); Kris Koski, et al., *Study on States' Policies and Regulations per CO2-EOR-Storage Conventional, ROZ and EOR in Shale: Permitting, Infrastructure, Incentives, Royalty Owners, Eminent Domain, Mineral-Pore Space, and Storage Lease Issues* (Sep. 2020), https://usea.org/sites/default/files/event-/Study%20on%20States%E2%80%99%20Policies%20and%20Regulations%20per%20CO2-EOR-Storage%20%281%29.pdf.

encouraging the development of zero carbon energy sources, state legislatures have been exercising their lawmaking authority to pave the way for new decarbonized energy development.

Once banned in at least sixteen states, there has been a resurgence of interest in nuclear generation, with several states repealing prior moratoria on new nuclear power plant construction.[17] For example, in 2017, Kentucky's legislature repealed a ban that prohibited the construction of nuclear power facilities in the state until the U.S. government had provided a means for disposal of high-level nuclear waste.[18] Instead, the new laws authorized the public service commission to approve nuclear power facilities where the storage plan was approved by the NRC.[19] In 2022, West Virginia enacted similar legislation that removed a ban that had been in place since 1996,[20] and in 2023, Alaska repealed its legislative approval requirement for microreactor siting.[21] These legislatures, and those in several other states, have removed prior restrictions and begun to create pathways for the construction of new nuclear generation.[22]

First-mover states have also taken more proactive action to accelerate the construction of advanced reactors. In 2020, Wyoming's legislature enacted new laws related to permitting small modular reactors and, in 2022, passed a bill that allows for temporary storage of high-level radioactive waste—which is fundamental for new reactor construction.[23] In 2023, the Texas governor directed the Public Utility Commission of Texas to create the Texas Advanced Nuclear Reactor Working Group to "study and plan for the use of advanced nuclear reactors in Texas," noting the growing demand for reliable and dispatchable power.[24] These efforts have been supported as part of the Idaho National Labs Frontiers

17. Tripp Baltz & Stephen Lee, *Nuclear Bans Tumble as Once-Skeptical States Seek Carbon Cuts*, BLOOMBERG LAW (Nov. 30, 2021), https://news.bloomberglaw.com/environment-and-energy/nuclear-bans-tumble-as-once-skeptical-states-seek-carbon-cuts; *What Is a Nuclear Moratorium?*, U.S. DEP'T OF ENERGY (Oct. 26, 2023), https://www.energy.gov/ne/articles/what-nuclear-moratorium.

18. KY. REV. STAT. ANN. § 278.605 (2022).

19. KY. REV. STAT. ANN. § 278.610 (2022).

20. S.B. 4, 85th Leg., Reg. Sess. (W. Va. 2022).

21. S.B. 177, 32nd Leg., Second Sess. (Alaska 2022).

22. *See, e.g.*, H.B. 273, 67th Leg., Reg. Sess. (Mont. 2021); A.B. 384, Reg. Sess. (Wis. 2015); S.B. 271, 122nd Gen. Assemb., 2d Reg. Sess. (Ind. 2022); H.B. 5783, 101st Leg., Reg. Sess. (Mich. 2022); H.B. 5202, Feb. Sess. (Conn. 2022).

23. H.B. 131, 65th Leg., Gen. Sess. (Wyo. 2022); S.F. 105, 65th Leg., Gen. Sess. (Wyo. 2023).

24. Letter from Greg Abbott, Governor of Tex., to Kathleen Jackson, Interim Chair, Pub. Util. Comm'n of Tex. (Aug. 16, 2023).

Initiative, which includes Wyoming, Idaho, Alaska, Utah, and Louisiana.[25]

State legislatures have also acted proactively to facilitate carbon capture and storage technologies as part of state energy agendas.[26] As a carbon removal technology, CCS enables the decarbonization of fossil generation and fuels production.[27] CCS involves the capture of carbon dioxide from point sources or the atmosphere, its transportation, and its eventual use or disposal through geologic sequestration.[28] States have moved to promote CCS by seeking primacy over the Underground Injection Control (UIC) Class VI regulatory program,[29] and by enacting legislation that reduces uncertainty and risk to carbon injection project developers.[30] These laws include statutes that, among other things, clarify ownership of subsurface storage space,[31] facilitate amalgamation or

25. Donna K. Spangler, *Louisiana Looks to Idaho National Laboratory for the Nuclear Strategy*, IDAHO NAT'L LAB'Y (July 25, 2024), https://inl.gov/feature-story/louisiana-looks-to-idaho-national-laboratory-for-a-nuclear-strategy; Pat Maio, *Wyoming Part of Aggressive Effort to Get Cutting Edge Nuclear Plants Online*, COWBOY STATE DAILY, (Mar. 13, 2024), https://cowboystatedaily.com/2024/03/13/wyoming-part-of-aggressive-effort-to-get-cutting-edge-nuclear-plans-online/.

26. *See* ANGELA C. JONES & ASHLEY J. LAWSON, CONG. RSCH. SERV., R44902, CARBON CAPTURE AND SEQUESTRATION (CCS) IN THE UNITED STATES (2022), https://sgp.fas.org/crs/misc/R44902.pdf.

27. Cameron Hepburn, et al., *The Technological and Economic Prospects for CO_2 Utilization and Removal,* 575 NATURE 87, 91 (2019); *Carbon Capture, Utilisation, and Storage*, IEA, https://www.iea.org/fuels-and-technologies/carbon-capture-utilisation-and-storage (last updated Apr. 25, 2024).

28. *See generally* Philip M. Marston & Patricia A. Moore, *From EOR to CCS: The Evolving Legal and Regulatory Framework for Carbon Capture and Storage*, 29 ENERGY L.J. 421, 431-437 (2008) (explaining the core elements of CCS, namely: capture, treating, compression and transport, injection and storage, and verification and monitoring).

29. *See, e.g.*, State of North Dakota Underground Injection Control Program, Class VI Primacy Approval, 83 Fed. Reg. 17758 (Apr. 24, 2018) (codified at 40 C.F.R. § 147.1751); Wyoming Underground Injection Control Program, Class VI Primacy, 85 Fed. Reg. 64053 (Oct. 9, 2020) (codified at 40 C.F.R. § 147.2550); State of Louisiana Underground Injection Control Program, Class VI Program Revision Application, 88 Fed. Reg. 28450 (May 4, 2023) (codified at 40 C.F.R. § 147.950).

30. Koski, et al., *supra* note 16, at 5.

31. *See* KY. REV. STAT. ANN. §§ 353.806, 353.808; MONT. CODE ANN. § 82-11-180(3); N.D. CENT. CODE §§ 47-31-03 to -04; WYO. STAT. ANN. § 34-1-152; NEB. REV. STAT. § 57-1604(1)-(2), (5); IND. CODE §§ 14-39-2 to -3; UTAH CODE ANN. § 40-6-20.5; W. VA. CODE § 22-11B-18(a)-(c).

unitization of property rights,[32] and allow transfer of liability to state entities following site closure.[33]

In the first half of 2024, several states, including Alaska, Alabama, Colorado, Illinois, and Pennsylvania, developed new legislative initiatives aimed at introducing or expanding legal frameworks for CCS.[34] Among these relationships are budding interstate energy agreements developed to address state climate initiatives.[35] Further, in some states that have yet to establish a comprehensive legislative framework for regulating CCS, project-related legislation is already serving to address aspects of carbon capture and sequestration within state-focused climate initiatives.[36]

Perhaps surprisingly, given the centrality of these technologies to climate policy, efforts to promote innovative energy projects aimed at carbon reduction have been primarily promoted by state legislatures in fossil-fuel producing states. These states are frequently those with economies historically reliant on coal production and power generation. Wyoming, West Virginia, Pennsylvania, Illinois, and Kentucky, the five highest coal producing states,[37] have all enacted legislation to encourage either CCS, advanced nuclear, or both. This connection makes sense. Carbon capture technology can reduce direct carbon emissions from fossil fuel use for generation and hydrogen production. As a result, CCS may extend the operational lifespan of existing coal mines, natural gas production, and generation facilities that might otherwise face premature closure during the transition to a decarbonized energy system. Moreover, sequestration projects may attract new investments and result in job creation associated with carbon removal industries. Similarly, where coal

32. *See* WYO. STAT. ANN. § 35-11-316; N.D. CENT. CODE § 38-22-10; MONT. CODE ANN. § 82-11-204(b); NEB. REV. STAT. § 57-1610(13); UTAH CODE ANN. §§ 40-11-10 to -11; W. VA. CODE § 22-11B-19; CAL. PUB. RES. CODE § 71461(a)(2).

33. *See* KY. REV. STAT. ANN. § 353.810; UTAH CODE ANN. §§ 40-11-15 to -16; LA. STAT. ANN. § 30:1109; MONT. CODE ANN. § 82-11-182; N.D. CENT. CODE § 38-22-17.

34. *See* COLO. REV. STAT. § 34-60-140; ALASKA STAT. §§ 41.06.130, .140; ALA. CODE § 9-17-154; S.B. 831, 207th Gen. Assemb., Reg. Sess. (Pa. 2023); S.B. 1289, 103rd Gen. Assemb. (Ill. 2024).

35. *See Memorandum of Understanding Between the State of Wyoming and the State of Colorado Regarding Direct Air Capture Industry Development* (June 21, 2023), https://drive.google.com/file/d/11k3YiM9F9UCji4hL0fkxtt4N3gIqB-pE/view?usp=sharing.

36. *See, e.g.*, IND. CODE § 32-24-5-2.

37. *Which States Produce the Most Coal?*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/tools/faqs/faq.php?id=69&t=2 (last updated Oct. 20, 2023).

plants are retired, new nuclear generation built on-site may leverage existing water, transportation, and transmission infrastructure.[38]

These zero carbon energy projects could provide an economic lifeline to energy communities and energy-producing states. The energy transition could have disastrous fiscal impacts on coal-producing states.[39] CCS and nuclear power production may provide these states with opportunities to maintain their economic structures by prolonging the life of existing assets, or creating new energy generation sectors, and thus providing stable and well-paying employment to workforces which otherwise may be imperiled by the energy transition.

III. RENEWABLE OR CLEAN AND LOW-CARBON?

Energy market policies are another form of state energy policy. Clean energy standards (CES) and renewable portfolio standards (RPS) require or incentivize portions of the state's electricity market to be generated from designated sources.[40] At least thirty-six states have adopted some form of energy market policy.[41] These laws are powerful market drivers of chosen energy generation sources, often requiring the utilities subject to them to source renewable power to meet a growing portion of demand even where lower-cost alternatives are available.[42] By mandating the composition of energy markets, these policies have been used to support objectives including promoting energy independence,

38. *See generally* George Griffith, TRANSITIONING COAL POWER PLANTS TO NUCLEAR POWER (Dec. 2021). In a September 2022 report, the U.S. Department of Energy identified more than 100 recently retired or operating coal plant sites that had the baseline attributes necessary to host an advanced nuclear reactor, *see* JASON K. HANSEN, ET AL., U.S. DEP'T OF ENERGY, INVESTIGATING BENEFITS AND CHALLENGES OF CONVERTING RETIRING COAL PLANTS INTO NUCLEAR PLANTS (2022).

39. Kelli F. Roemer & Julia H. Haggerty, *The Energy Transition as Fiscal Rupture: Public Services and Resilience Pathways in a Coal Company Town*, 91 ENERGY RSCH. & SOC. SCI. 102752 (2022).

40. *See Renewable Energy Explained—Portfolio Standards*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/energyexplained/renewable-sources/portfolio-standards.php (last updated July 30, 2024). While recognizing the difference between an RPS and a CES, most trackers of state law in this area only monitor the various RPS standards. *See id.* Even less documented is the prevalence of unique standards, such as Wyoming's Energy Generation Portfolio Standard, which requires utilities to generate a percentage of their energy from sources utilizing CCS technology. *See* WYO. STAT. ANN. §§ 37-18-101 to -102 (2022); 023-3 WYO. CODE R. § 3-38.

41. U.S. ENERGY INFO. ADMIN., *Renewable Energy Explained—Portfolio Standards*, *supra* note 40.

42. *See also* TRIEU MAI, ET AL., A PROSPECTIVE ANALYSIS OF THE COSTS, BENEFITS, AND IMPACTS OF U.S. RENEWABLE PORTFOLIO STANDARDS, NAT'L RENEWABLE ENERGY LAB'Y, & LAWRENCE BERKELEY NAT'L LAB'Y, 23-25 (2016), https://www.nrel.gov/docs/fy17osti/67455.pdf.

stabilizing electricity prices, and protecting clean air and water.[43] RPS have been praised for their transformational impact on the United States' energy system.[44] By some estimates, RPS have decarbonized the electricity generation sector faster than would have occurred under the Clean Power Plan.[45] According to the EPA, "state power sector policies will impact the electric generation fleet for decades."[46]

Most state electricity standards can be classified as either RPS or CES.[47] Although the standards function in the same way, they differ in the types of resources they preference.[48] RPS favor a more selective group of resources,[49] privileging traditional "renewable" technologies such as solar and wind,[50] however excluding other "clean" technologies such as nuclear and fossil generation decarbonized with CCS.[51] Although the details of the standards vary, CES are generally more expansive.[52] CES allocate market share to both renewable and non-renewable sources that

43. Lincoln L. Davies, *Power Forward: The Argument for a National RPS*, 42 CONN. L. REV. 1339, 1358 (2010) (explaining the evolution of RPS goals over time).

44. *See* Anthony E. Chavez, *Using Renewable Portfolio Standards to Accelerate Development of Negative Emissions Technologies*, 43 WM. & MARY ENV'T L. & POL'Y REV. 1, 34-35 (2018).

45. *See* Allyson Browne, *RPS Evolving: States Take on U.S. Climate Goals*, 31 NAT. RES. & ENV'T 50, 51 (2017), http://www.jstor.org/stable/44213919 (stating that RPS would "amplify" the benefits of the Clean Power Plan).

46. New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions from Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule, 89 Fed. Reg. 39798, 39821 (May 9, 2024) (to be codified at 40 C.F.R. pt. 60).

47. Ryan Fitzpatrick, et al., *Clean Energy Standards: How More States Can Become Climate Leaders*, THIRD WAY (June 27, 2018), https://www.thirdway.org/report/clean-energy-standards-how-more-states-can-become-climate-leaders; *but see* WYO. STAT. ANN. §§ 37-18-101 to -102 (2022); 023-3 WYO. CODE R. § 3-38 (2023) (creating a CCS standard for Wyoming that is not appropriately described as a CES or an RPS).

48. *See* Fitzpatrick, *supra* note 47.

49. *See, e.g.*, CAL. PUB. UTIL. CODE § 399.15(b) (West 2022) (requiring "retail sellers" of electricity to procure sixty percent of their generation portfolios from "eligible renewable energy resources" by the end of 2030).

50. N.M. STAT. ANN. §§ 62-16-3(H), § 62-16-4(A)(5) (2022) (requiring renewable resources, including solar and wind, to supply no less than eighty percent of utilities' total sales of electricity within the state by 2040).

51. NEV. REV. STAT. § 704.7811(2) (2022) ("[renewable energy] does not include . . . nuclear energy"); CAL. PUB. RES. CODE § 25741(a)(1) (West 2022) (creating a list of generation sources that may be used by a facility that are considered a "renewable electrical generation facility" and omitting nuclear energy from that list).

52. *See* Fitzpatrick, et al., *supra* note 47.

nonetheless produce electricity without emitting carbon.[53] CES may allow generation from either nuclear or CCS, or both, to satisfy the portion of the market set aside for certain zero carbon sources.[54]

These two approaches to electricity standards advance different goals. RPS assure a market for renewable energy generation by requiring utilities to purchase renewable energy even if less expensive and more reliable generation is available. Conversely, CES direct utilities to eliminate carbon from their portfolios but is resource agnostic. CES, therefore, provide utilities with the flexibility to determine how best to meet carbon reduction standards while accounting for additional factors such as cost, social acceptance, reliability, land footprints, and other environmental concerns.

Although often presented as binary, RPS and CES approaches to electricity standards are not necessarily exclusive.[55] Some states, such as Colorado and New Mexico, have both.[56] In these states a certain market share is reserved strictly for renewables, with a smaller market share available more broadly to all clean generation sources.[57] Carbon-emitting sources are left with minimal market availability, if any.[58] The RPS in New Mexico, for example, is unfavorable to non-renewable energy sources as it progressively increases the market share reserved for renewables until 2040, at which point renewables will be guaranteed an eighty percent share of the state's market for electricity sold by public utilities.[59] At that point, only twenty percent of the state's electricity market would be available for electricity generated from zero carbon—

53. *See, e.g.*, COLO. REV. STAT. § 40-2-125.5(2)(b) (2022); H.B. 301, 32d Leg., Reg. Sess. (Alaska 2022).

54. CES, unlike some RPS, often define the preferred energy source using an open-ended definition that describes characteristics of the types of generation sources allowed rather than using a list of acceptable sources. *See, e.g.*, COLO. REV. STAT. § 40-2-125.5(2)(b) (2022) ("'[c]lean energy resource' means any electricity-generating technology that generates or stores electricity without emitting carbon dioxide into the atmosphere"); WASH. REV. CODE § 19.405.020(28)(a) (2022) ("'[n]onemitting electric generation' means electricity . . . that does not emit greenhouse gases as a by-product of energy generation"). These definitions thus often seemingly include CCS and nuclear, which do not produce carbon emissions. *See* COLO. REV. STAT. § 40-2-125.5(2)(b); WASH. REV. CODE § 19.405.020(28)(a).

55. CAL. PUB. UTIL. CODE §§ 399.11, 399.15, 399.30, 454.53 (2018) (outlining California's overlapping CES and RPS).

56. *See, e.g.*, COLO. REV. STAT. § 40-2-124 (2022) (creating Colorado's renewable portfolio standard); COLO. REV. STAT. § 40-2-125.5 (2022) (creating Colorado's clean energy standard).

57. *See, e.g.*, *id.* §§ 40-2-124, 40-2-125.5.

58. *See id.*

59. See N.M. STAT. ANN. § 62-16-4(A)(1)-(5) (2023).

yet non-renewable sources such as nuclear or fossil generation decarbonized with CCS.[60]

State policies may further restrict electricity markets by specifically excluding certain generation resources from the portion of the market not covered by the RPS. For instance, Washington and Oregon have specifically excluded coal from their electricity markets. Oregon requires elimination of all coal-fired resources from its electricity allocation by 2030.[61] Washington's policy requires the elimination of coal-fired electricity and mandates that all electricity sold within the state be carbon-free by 2045.[62] After 2025, rates cannot include costs associated with coal-fired resources.[63] Under these laws, even if coal generation is decarbonized with CCS, the resulting power cannot be sold within the state. That means that to meet Washington's one hundred percent carbon-free goal by 2045, it will have to rely on other carbon-free resources such as nuclear and hydro while also balancing the affordability targets within that standard.[64]

IV. RETHINKING RENEWABLE BIAS

Energy standards determine the portion of the cumulative electricity market that is available for certain resources, and therefore impact utilities' generation portfolios and resource planning. Under an RPS, a non-renewable zero carbon resource must compete economically with lower-cost conventional fossil-fuel sources for the remaining share of the market, therefore discouraging carbon reduction for such market share. For example, while Nevada only preferences fifty percent of the market for renewables, without an equivalent zero carbon standard, CCS and nuclear would have to compete with lower-cost fossil generation for the remaining portion of the market to which it has access.[65] Given the availability of less expensive alternatives, utility regulators may not

60. *See id.* § 62-16-4(A)(6).

61. OR. REV. STAT. § 757.518(2) (2022) ("On or before January 1, 2030, an electric company shall eliminate coal fired resources from its allocation of electricity.").

62. WASH. REV. CODE § 19.405.010(2) (2022) ("It is the policy of the state to eliminate coal-fired electricity, transition the state's electricity supply to one hundred percent carbon-neutral by 2030, and one hundred percent carbon-free by 2045.").

63. WASH. REV. CODE § 19.405.030(1)(a) (2022) ("On or before December 31, 2025, each electric utility must eliminate coal-fired resources from its allocation of electricity. This does not include costs associated with decommissioning and remediation of these facilities.").

64. WASH. REV. CODE § 19.405.120(2) (2022); Washington Utils. & Transp. Comm'n v. Puget Sound Energy, Docket Nos. UE-220066 & UG-220067 (consolidated), Final Order 10 (Dec. 22, 2022).

65. *See* NEV. REV. STAT. § 704.7821(1) (2022).

approve cost recovery for more expensive decarbonized generation.[66] This could discourage investment in new clean energy technologies, slowing overall decarbonization of the electricity sector. CES, which require reductions in the carbon intensity of electricity sold in state markets, would appropriately refocus energy market policies on encouraging the development of sustainable clean energy systems.[67]

One reason for the move towards CES is that RPS have largely achieved their intended purpose. One of the early goals of most RPS legislation was "to ensure the development of a renewable energy market."[68] RPS, together with clean energy production tax credits, have been successful in rendering this goal obsolete. Solar and wind have become increasingly cost-effective, a trend that is expected to continue.[69] Under a CES, renewables would still maintain an initial cost advantage over many other clean-energy alternatives and would likely remain a predominant energy source to hit clean energy targets.[70] Today, it is deep decarbonization technologies like hydrogen, CCS, and nuclear that need assistance achieving scale to help meet the nation's overall decarbonization goals.[71]

Consistent with these developments, federal decarbonization incentives have pivoted towards a technology neutral approach. With the passage of the Inflation Reduction Act, Congress enacted a new incentive to encourage investments in zero carbon energy. The Clean Electricity Production Credit and the Clean Electricity Investment Tax Credit provide incentives to any energy facility with net zero emissions—

66. *See* Emily Hammond & Jim Rossi, *Stranded Costs and Grid Decarbonization*, 82 BROOK. L. REV. 645 (2017).

67. *See* U.N. Dep't of Econ. & Soc. Affairs, *Sustainable Development Goals Report 2023: Special Edition*, at 26-27 (July 10, 2023), https://unstats.un.org/sdgs/report/2023/The-Sustainable-Development-Goals-Report-2023.pdf.

68. Brent J. Hartman, *Defining "Biomass": An Examination of State Renewable Energy Standards*, 19 TEX. WESLEYAN L. REV. 1, 7 (2012).

69. *See* Int'l Renewable Energy Agency [IRENA], *Renewable Power Generation Costs in 2021*, at 26, 50-56 (2022), https://www.irena.org/publications/2022/Jul/Renewable-Power-Generation-Costs-in-2021.

70. Steven Ferrey, *Counter-Intuitive Climate Forcing: Post Paris Agreement Corporate Incentives*, 43 VT. L. REV. 629, 657-58 (2019).

71. *See Nuclear Explained: U.S. Nuclear Industry*, U.S. ENERGY INFO. ADMIN., (last updated Aug. 24, 2023), https://www.eia.gov/energyexplained/nuclear/us-nuclear-industry.php (stating that, despite the fairly large number of operational nuclear reactors in the U.S., very few have been constructed since the 1990s, and many are shutting down); *see also Carbon Capture Projects See Meteoric Growth in 2022*, YALE ENV'T 360 (Oct. 17, 2022), https://e360.yale.edu/digest/carbon-capture-storage-ccs-growth (explaining that, despite the recent growth of CCS, projects currently announced will not be enough to meet many emissions goals).

thereby including combustion and gasification facilities with CCS and non-combustive sources, including wind, solar, hydro, marine energy, fusion, fission, geothermal, waste to energy recovery, and future zero carbon technologies.[72] Federal procurement policies also focus on "carbon pollution-free" energy. Executive Order 14057 set forth a government-wide goal to "lead by example" by transitioning to "100 percent carbon pollution-free electricity on a net annual basis by 2030, including 50 percent 24/7 carbon pollution-free electricity."[73] Section 603 of the Executive Order defines "carbon pollution-free electricity" as:

> electrical energy produced from resources that generate no carbon emissions, including marine energy, solar, wind, hydrokinetic (including tidal, wave, current, and thermal), geothermal, hydroelectric, nuclear, renewably sourced hydrogen, and electrical energy generation from fossil resources to the extent there is active capture and storage of carbon dioxide emissions that meets EPA requirements.[74]

Greater flexibility and technology options will help enable states to realistically set more ambitious decarbonization targets, which will accelerate the commercialization of advanced decarbonization technologies. Over time, RPS may substantially increase the cost of electricity as the renewable percentages increase, particularly as greater investments in energy storage are required to accommodate an increasing share of renewables.[75] In contrast, CES may reduce the costs of decarbonization to consumers. By providing utilities with greater flexibility, CES increase competition to reduce emissions and encourage market efficiency while lowering the overall compliance costs.[76] A recent study by the Harvard School of Public Health found that if an eighty percent nationwide clean energy standard were adopted, it would likely reduce electricity rates and improve public health relative to alternatives.[77]

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72. Inflation Reduction Act of 2022, Pub. L. No. 117-169, 136 Stat. 1818, §§ 13701-13702 (2022); Section 45Y Clean Elec. Prod. Credit & Section 48E Clean Elec. Inv. Credit, 89 Fed. Reg. 47792 (June 3, 2024) (to be codified at 26 C.F.R. pt. 1).

73. Exec. Order No. 14,057, *Catalyzing Clean Energy Industries & Jobs Through Federal Sustainability*, 86 Fed. Reg. 70935 (Dec. 8, 2021).

74. *Id.*

75. Michael Greenstone & Ishan Nath, *Do Renewable Portfolio Standards Deliver Cost-Effective Carbon Abatement?* 33 (U. Chi. Becker Friedman Inst. for Econ., Working Paper No. 2019-62, 2020), https://dx.doi.org/10.2139/ssrn.3374942.

76. *See* KATHRYNE CLEARY, ET AL., *Clean Energy Standards*, RESOURCES FOR THE FUTURE 1-2 (2019), https://www.rff.org/publications/issue-briefs/clean-energy-standards (noting that some states with RPS goals have allowed them to lapse or expire without being met).

77. CHARLES DRISCOLL, ET AL., AN 80X30 CLEAN ELECTRICITY STANDARD: CARBON, COSTS, AND HEALTH BENEFITS 16 (2021).

Such a standard would still support the economic growth associated with the development of new electricity sources while also supporting system reliability,[78] thus reducing the likelihood of power interruptions, which have their own social and economic consequences.[79]

CES would also reduce regulatory inconsistencies that hinder state energy development ambitions.[80] Conflicting state policies currently lack harmonious implementation within regional interconnections,[81] creating tension between the places where the energy is produced and where it is sold. Unlike policies designed to encourage or discourage facility construction within the states enacting them, energy portfolio standards dictate the generation mix of electricity sold, regardless of where it is produced. These policies may, therefore, impact not only investments in generation within the states enacting energy policies but also in states that furnish energy into those markets. In the western United States, the predominance of RPS and the concentration of energy-consuming populations in the most restrictive states particularly amplify these restrictions.[82] For example, while Washington and Oregon have prohibited sales of electricity generated with coal, Wyoming has enacted policies to create roadblocks to the closure of coal-fired generation, including authorizing funds to challenge anti-coal policies of other states and requiring utilities to consider first decarbonizing the power stations with CCS.[83] These policies on both sides miss the mark. By fighting over the resources used, they neglect a shared goal: to create a decarbonized

78. Jamal Mamkhezri, et al., *Assessing the Economic and Environmental Impacts of Alternative Renewable Portfolio Standards: Winners and Losers*, 14 ENERGIES 3319 (2021).

79. SUNHEE BAIK, ET AL., A HYBRID APPROACH TO ESTIMATING THE ECONOMIC VALUE OF ENHANCED POWER SYSTEM RESILIENCE, ERNEST ORLANDO LAWRENCE BERKELEY NAT'L LAB'Y 18 (2021).

80. *See* Danielle Stokes, *Renewable Energy Federalism*, 106 MINN. L. REV. 1757, 1792 (2022).

81. Alexandra B. Klass & Shantal Pai, *The Law of Energy Exports*, 109 CALIF. L. REV. 733, 737 (2021) ("[R]egional differences among states—with regard to both energy resources and, now, energy policy—have created new roadblocks for energy exports."); *See* DEP'T OF ENERGY, ELECTRICITY TRANSMISSION SYSTEM RESEARCH AND DEVELOPMENT: GRID OPERATIONS (2021), https://overbye.engr.tamu.edu/wp-content/uploads/sites/146/2022/11/Grid-Operations-Bose-Overbye_0.pdf.

82. *See* CAL. PUB. UTIL. CODE § 399.15(b)(2)(B) (2022); NEV. REV. STAT. § 704.7821(1); N.M. STAT. ANN. § 62-16-4(A) (2022); OR. REV. STAT. § 469A.052(1)(h) (2022). These four states collectively comprise over half of the total population of the states in the western interconnection. *See Explore Your State*, U.S. CENSUS BUREAU, https://data.census.gov/cedsci/profile?q=United%20States&g=0100000US.

83. Tara Righetti, et al., *Adapting to Coal Plant Closures: A Framework for Understanding Energy Transition Resistance,* 51 ENV'T L. 957 (2022).

electricity system that provides affordable energy while supporting the economies of energy communities and protecting the environment.[84]

CES could resolve some of these conflicts by providing states with greater autonomy over development of in-state generation resources consistent with decarbonization and market goals.[85] In fact, some net-energy exporting states have argued that RPS in energy consuming states violate the dormant commerce clause by impermissibly meddling in generation decisions and by creating extraterritorial impacts on their state employment and economies.[86] Federal courts have held that certain state RPS laws violate the dormant commerce clause, and the U.S. Supreme Court's review of the impermissible scope of extraterritoriality failed to answer how states should address out-of-state commerce in light of RPS specifications and restrictions.[87] Given that the flow of electricity is relatively variable from state to state, a geographical energy preference or limitation upon the energy market flowing into a state could be viewed as unconstitutional.[88] CES policies that do not alter the energy functionality or geographic accessibility of the market present fewer constitutional concerns, thus allowing for state policymakers to craft efforts to address climate change through clean energy advancements largely free of worry or legal challenge.[89]

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84. *See* Fitzpatrick, *supra* note 47.

85. *See* Sam Kalen, *Dormancy Versus Innovation: A Next Generation Dormant Commerce Clause*, 65 OKLA. L. REV. 381, 383 (2013) ("The DCC surfaces, for instance, when states restrict the import of carbon intensive energy or when they require the purchase of local renewable resources. Also, states' regional efforts to address climate change may implicate the DCC, to the extent that such programs address the problem of leakage of GHG emissions to areas outside of the regional effort."); James W. Coleman, *Importing Energy, Exporting Regulation*, 83 FORDHAM L. REV. 1357 (2014).

86. Steven Ferrey, *Legal History Repeats Itself on Climate Change: The Commerce Clause and Renewable Energy*, 33 GEO. ENV'T L. REV. 489, 508 (2021); Felix Mormann, *Market Segmentation vs. Subsidization: Clean Energy Credits and the Commerce Clause's Economic Wisdom*, 93 WASH. L. REV. 1853, 1901 (2018) ("In creating a market specifically for solar, wind, and other renewables, RPS policies introduce a new market segment that is off limits to all non-renewable sources of energy.").

87. *See* Niina H. Farah, *What a Supreme Court Case on Pigs Means for Renewable Energy*, E&E NEWS (Oct. 7, 2022), https://www.eenews.net/articles/what-a-supreme-court-case-on-pigs-means-for-renewable-energy; *see also* Nat'l Pork Producers Council v. Ross, 598 U.S. 356 (2023).

88. Kevin Todd, *The Dormant Commerce Clause and State Clean Energy Legislation*, 9 MICH. J. ENV'T & ADMIN. L. 189 (2020); *see* Mormann, *supra* note 86, at 1901.

89. Mormann, *supra* note 86, at 1901 (discussing that when segmented along functional lines, RPS policies present "little, if any, constitutional concerns . . . [w]hen, however, state policymakers draw the RPS line in geographic terms to capture economic benefits in-state, they facially discriminate against out-of-state actors in violation of the dormant Commerce Clause.").

Recognizing the need for some consistency between state standards, there remains a strong argument for maintaining state regulatory control over electricity markets. Thus far, states have largely led the way with innovation in renewable and clean energy policy.[90] There have been proposals to preempt such state-level policymaking through adoption of national CES or RPS.[91] Such a standard would almost certainly be challenged by states, who traditionally have had economic regulatory authority over electricity sales. A national clean energy or renewable portfolio standard could invite challenges similar to those brought against the Clean Power Plan, many of which were rooted in federalism and argued against the plan's invasion of traditional state authority.[92]

State-based regulation also offers its own benefits. While a federal policy may accelerate the achievement of climate goals, regulation of state-level energy markets would stifle innovation and flexibility. The localized focus of state energy policies allows for greater customization, permitting state legislatures to make important tradeoffs between goals such as electricity cost and reliability when deciding whether or how to regulate the electricity mix.[93] State-based regulation also empowers state legislatures to pursue multiple goals with a single policy and thus increase the likelihood of bipartisan support.[94] A diversity of approaches in the timelines and thresholds within CES may also provide greater stability by buffering against sudden and unpredictable changes in federal energy policies, thus facilitating a smoother transition to a decarbonized electricity system.[95]

The EPA's new rules under Section 111 of the Clean Air Act prompt further contemplation.[96] The rule identifies CCS as the best system of emissions reduction (BSER), as it requires existing coal-fired generating facilities to install CCS or retire by 2032 and mandates installation of CCS

90. *See* Elizabeth Kronk Warner & Uma Outka, *SDG 7: Affordable and Clean Energy*, 53 ENV'T L. REP. 10124, 10127 (2023); *see also* Fitzpatrick, *supra* note 47.

91. *See, e.g.*, Joseph A. Aldy, *Promoting Clean Energy in the American Power Sector: A Proposal for a National Clean Energy Standard*, 42 ENV'T L. REP. NEWS & ANALYSIS 10131, 10132 (2012).

92. *See* William W. Buzbee, *Federalism Hedging, Entrenchment, and the Climate Challenge*, 2017 WIS. L. REV. 1037, 1081.

93. *See* Fitzpatrick, *supra* note 47.

94. *See* Barry Rabe, *Race to the Top: The Expanding Role of U.S. State Renewable Portfolio Standards,* 7 SUSTAINABLE DEV. L. & POL'Y 10 (2007).

95. *See* Albert C. Lin, *Climate Policy Buffers*, 39 YALE J. ON REG. 699, 737-38 (2022).

96. New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions from Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule, 89 Fed. Reg. 39798 (May 9, 2024).

on almost all new or modified coal- or gas-powered electric generating units.[97] Assuming it is upheld,[98] the rule will substantially change the United States' electricity market, resulting in near decarbonization of the electricity sector by 2040.[99] In this scenario, RPS would require utilities to choose renewable sources even without a corresponding emissions reduction benefit, eclipsing other considerations related to cost, reliability, and land and wildlife impacts. Even more ironically, RPS may eventually favor unmitigated fossil burning sources over decarbonized fossil sources in the remaining portion of the market. EPA's rule exempts gas turbines and new gas generation not intended for operation above forty percent capacity.[100] The high costs of energy storage and emissions reduction for other sources might well mean that these exempt sources become the lowest-cost generation resources available compared to other zero carbon dispatchable resources.

97. *Id.*

98. Traditionally, agencies like the EPA have exercised considerable latitude in interpreting the statutes they administer, pursuant to deference afforded under *Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837 (1984). In *West Virginia v. EPA*, 597 U.S. 697 (2022), the Court restricted the EPA's authority to regulate carbon dioxide emissions under the Clean Air Act through the application of the Major Questions Doctrine. This doctrine is central to ongoing challenges to EPA regulation of greenhouse gas emissions regardless of the results promulgated by *Loper Bright Enterprises v. Raimondo*, 603 U.S. 369 (2024). While the Supreme Court has affirmed that judicial deference will continue to apply in cases where environmental laws grant the EPA the discretion to set human health or environmental standards, the evolving landscape of agency deference could significantly impact and alter the application of EPA's new rules under Section 111 of the Clean Air Act. Following the enactment of the new EPA rules, twenty-five states sued to challenge the rule. Following the denial of the request for an administrative stay by the D.C. Circuit on July 19, 2024, six states filed an emergency application to Chief Justice Roberts requesting an administrative stay. See *West Virginia v. EPA*, No. 24A95 (filed July 23, 2024), https://www.supremecourt.gov/docket/docketfiles/html/public/24a95.html.

99. Some emissions from coal generation would persist due to capture efficiencies being less than one hundred percent. "EPA is finalizing CCS with 90 percent capture as the BSER for existing coal-fired steam generating units with a compliance date of January 1, 2032. These 'long-term' units have a presumptive standard of 88.4 percent reduction in annual emission rate." U.S. ENV'T PROT. AGENCY, CPS-111 FACT SHEET: STANDARDS AND RIA 2024 3 (Apr. 2024), https://www.epa.gov/system/files/documents/2024-04/cps-111-fact-sheet-standards-and-ria-2024.pdf.

100. Existing natural gas turbines are exempt from the rule. However, EPA Administrator Michael Regan has said that the "[a]gency is taking a new, comprehensive approach to cover the entire fleet of natural gas-fired turbines." U.S. ENV'T PROT. AGENCY, *Statement by EPA Administrator Michael S. Regan on EPA's Approach to the Power Sector* (last updated Mar. 4, 2024), https://www.epa.gov/newsreleases/statement-epa-administrator-michael-s-regan-epas-approach-power-sector.

V. CONCLUSION

Energy standards that disadvantage nuclear and zero carbon energy produced with CCUS are at odds with national and global policies calling for "deep, rapid, and sustained reductions in greenhouse gas emissions in line with 1.5 degree pathways."[101] The Outcome of the First Global Stocktake, produced at COP28 in Dubai, focuses on moving towards net zero emission energy systems.[102] To do so, it suggests increasing renewables, phasing out unabated fossil uses, and "accelerating zero- and low-emission technologies, including, inter alia, renewables, nuclear, abatement and removal technologies such as carbon capture and utilization and storage, particularly in hard-to-abate sectors, and low-carbon hydrogen production."[103]

While federal energy regulations related to carbon emissions may shift as administrations change, states have an opportunity to create alignment with international goals by focusing their market regulations on sector-wide emissions reduction rather than promoting specific technologies. The benefit provided to the renewable sector comes at a significant cost. Lack of mutualization between state energy policies has the potential to create inefficiencies and market distortions, which ultimately slow decarbonization efforts, present implementation and legal concerns, and increase costs to consumers. A move towards technology-neutral low-carbon energy standards would reduce these incongruencies, advancing decarbonization objectives while affording energy-producing states the flexibility to decide how to democratically balance the tradeoffs associated with energy production.

101. U.N. Framework Convention on Climate Change, Outcome of the First Global Stocktake, at 5, U.N. Doc. FCCC/PA/CMA/2023/L.17 (Dec.13, 2023).

102. *Id.*

103. *Id.*