ARTICLE

LESSONS IN CLIMATE DERISKING: THE UNITED STATES' FAILED NUCLEAR RENAISSANCE

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Ameliorating climate change depends centrally upon transforming the energy system to run on clean energy. In turn, this transformation requires finding entities willing and able to build massive amounts of new clean energy infrastructure. The emerging U.S. strategy for inducing this buildout is via "climate derisking," which involves using government incentives to cajole private investment in the clean energy transition by lowering the chances that such investments might not yield sufficient profits.

The United States' landmark 2022 climate legislation, the Inflation Reduction Act (IRA), represents an unprecedented embrace of climate derisking. In this Article, we contend that an underexplored antecedent of the IRA provides critical insight into the promise and perils of a derisking approach to climate change. In the early 2000s, the United States attempted to create a nuclear power renaissance through legislative derisking, with disappointing results. All told, nuclear derisking legislation spurred nuclear investments in only a few southern states, where it ultimately resulted in tens of billions of dollars of wasted expenditures and little new carbon-free electricity.

After situating derisking within theories of infrastructure development, the Article chronicles attempts to revitalize nuclear power across four states: Georgia, South Carolina, Florida, and North Carolina, drawing from relevant legislation,

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administrative actions, court cases, news accounts, and interviews with key stakeholders. We then consider what lessons the failed nuclear renaissance offers the significant project of derisking clean energy now underway in the United States and beyond. The U.S. nuclear non-renaissance highlights a range of risks that accompany clean energy infrastructure development, including regulatory risks, scalar risks, temporal risks, and cultural risks. These multiple dimensions of project risk render the IRA's cabined emphasis on financial *derisking a limited method of driving the clean energy transition. We contend that far more direct public control over this infrastructural transformation is necessary to realize the scope of change that fundamental scientific imperatives demand. More immediately, we explore how the lessons that haunt nuclear power might be put to use in administering the IRA for maximum efficacy in achieving both its climate and broader social aims.*

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INTRODUCTION

Ameliorating climate change depends centrally upon transforming the energy system to run on clean energy.[1] In turn, this transformation requires finding entities willing and able to build massive amounts of new clean energy infrastructure.[2] In 2022, the United States passed pathbreaking legislation aimed at precisely this challenge: the Inflation Reduction Act (IRA).[3] The IRA is a momentous political achievement, eked out of the barest of Senate majorities and yet growing in popularity across both major U.S. political parties.[4] If it endures, it may prove to be a history-making pivot in U.S. and global climate policy that sets the country and the planet on a plausible path to atmospheric stabilization.[5] Regardless of its particular fate, the core policy tools used in the IRA appear the most viable ones for the modern political era. That makes understanding the nature of these tools and their challenges critical for all who care about making climate policy work.

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1 *See* Jesse D. Jenkins, Max Luke & Samuel Thernstrom, *Getting to Zero Carbon Emissions in the Electric Power Sector*, 2 JOULE 2498, 2498 (2018) (identifying electric power as the "linchpin of efforts" to limit greenhouse-gas emissions); Florian Knobloch, Steef V. Hanssen, Aileen Lam, Hector Pollitt, Pablo Salas, Unnaa Chewpreecha, Mark A.J. Huijibregts & Jean-Francois Mercure, *Net Emission Reductions from Electric Cars and Heat Pumps in 59 World Regions over Time*, 3 NATURE SUSTAINABILITY 437, 437 (2020) (observing the importance of electrification for decarbonizing transportation and heating).

2 *See* STEPHEN NAIMOLI & SARAH LADISLAW, CTR. FOR STRATEGIC & INT'L STUD., DEEP DECARBONIZATION PATHWAYS 2 (2020), https://www.csis.org/analysis/climate-solutions-series-deep-decarbonization-pathways [https://perma.cc/ZKC8-LHQA] (finding that electricity's share of energy demand will need to triple to reach net-zero emissions); *see also* Jenkins et al., *supra* note 1, at 2506 ("Across global decarbonization scenarios . . . electricity demand increases 20%–120% by 2050.").

3 *See generally* Pub. L. No. 157-169, 136 Stat. 1818 (2022).

4 *See* Letter from Andrew R. Garbarino, Rep., U.S. House of Reps. et al. to Mike Johnson, Speaker, U.S. House of Reps. (Aug. 6, 2024), https://garbarino.house.gov/sites/evo-subsites/garbarino.house.gov/files/evo-media-document/FINAL%20Credits%20Letter%202024.08.06.pdf [https://perma.cc/A892-X9ZP] (urging the Speaker to continue the IRA's tax credits and highlighting the fears of constituents who worry that "the energy tax regime will once again be turned on its head due to Republican repeal efforts"); *see also* Memorandum from E2 to Policymakers, Media & Other Interested Parties, Clean Energy Works: Inflation Reduction Act Two-Year Analysis 1 (Aug. 14, 2024), https://s3.documentcloud.org/documents/25042572/e2-clean-economy-works-ira-two-year-review_august-2024.pdf [https://perma.cc/5DBJ-WWFG] ("Nearly 60 percent of the announced projects [spurred by the IRA]—representing 85 percent of the investments and 68 percent of the jobs—are in Republican congressional districts.").

5 Early models of the IRA's potential suggest that, by 2030, it may set the United States on course to cut economy-wide CO_2 emissions by 35% to 43% below 2005 levels and electricity sector emissions as much as 83% below 2005 levels. U.S. ENV'T PROT. AGENCY, EPA 430-R-23-004, ELECTRICITY SECTOR EMISSIONS IMPACTS OF THE INFLATION REDUCTION ACT 9, 11 (2023), https://www.epa.gov/system/files/documents/2023-09/Electricity_Emissions_Impacts_Inflation_Reduction_Act_Report_EPA-FINAL.pdf [http://perma.cc/7HDY-2JWV].

The IRA represents the latest and largest embrace of an emerging theory of climate policy that scholars have labeled "derisking."[6] Climate derisking involves using government policies and incentives to cajole private investment in the clean energy transition by lowering the chances that such investments might not yield sufficient profits. This is a marked change from long-prevailing theories of carbon taxation as the most desirable way to drive decarbonization.[7] For better or worse, the derisking model is explicitly premised on a theory that the most tractable path to rapid decarbonization is to make clean energy projects more enticing to private investors, rather than focus on penalizing fossil fuel producers or consumers.[8] To this end, modelers project that the IRA will result in upwards of *one trillion* dollars of government incentives flowing to private investors in clean energy infrastructure.[9] In both its scale and breadth, the IRA represents an unprecedented embrace of derisking theory as a core strategy for tackling climate change.[10]

To be sure, outside of climate policy, derisking strategies have a long lineage in the United States. They date back at least to the development of railroads in the 1800s, when the U.S. government dangled land grants and a range of financial incentives as inducements for railroads to build out their tracks.[11] But the predominant model for energy infrastructure development

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6 *See* DANIELA GABOR, THE (EUROPEAN) DERISKING STATE 6 (2023), https://doi.org/10.31235/osf.io/hpbj2 [https://perma.cc/UZ3L-C7TH] ("Both in the EU and the US, derisking has emerged as *the* method to organise green industrial upgrading . . . ."); Brett Christophers, *Taking Renewables to Market: Prospects for the After-Subsidy Energy Transition*, 54 ANTIPODE 1519, 1521 (2022) (arguing that state support for renewables is critical because "the private sector is not confident that it can earn returns that it considers acceptable"); Lucy Baker, *Procurement, Finance and the Energy Transition: Between Global Processes and Territorial Realities*, 5 ENV'T. & PLAN. E: NATURE & SPACE 1738, 1751 (2022) (noting importance of public finance in derisking global renewable energy investment).

7 *See infra* Part I.

8 *See* Gabor, *supra* note 6, at 22-25 (describing a "carrots without sticks" approach to derisking).

9 *See* Josh Saul, *Goldman Sees Biden's Clean-Energy Law Costing US $1.2 Trillion*, BLOOMBERG (Mar. 23, 2023, 2:10 PM), https://www.bloomberg.com/news/articles/2023-03-23/goldman-sees-biden-s-clean-energy-law-costing-us-1-2-trillion?embedded-checkout=true [http://perma.cc/CN7S-EA5P] (reporting that spending via clean energy tax credits may reach $1.2 trillion, more than three times official estimates).

10 *See* GABOR, *supra* note 6, at 6; Brett Christophers, *Why Are We Allowing the Private Sector to Take Over Our Public Works?*, N.Y. TIMES (May 8, 2023), https://www.nytimes.com/2023/05/08/opinion/inflation-reduction-act-global-asset-managers.html [https://perma.cc/522B-P52K] ("The I.R.A. will help accelerate the growing private ownership of U.S. infrastructure . . . .").

11 *See* MORGAN RICKS, GANESH SITARAMAN, SHELLEY WELTON & LEV MENAND, NETWORKS, PLATFORMS, & UTILITIES: LAW & POLICY 478-80 (2022) (tracing federal support for the U.S. rail buildout); *cf.* CTR. FOR STRATEGIC & INT'L STUD., HAMILTON DECARBONIZATION (2021), https://www.csis.org/analysis/hamilton-decarbonization [https://perma.cc/8PTR-L39J] (analogizing Biden's decarbonization strategy to Alexander

has been a different one: that of public utility law. Public utility law awards utilities a quasi-public status, granting them monopoly service territories and constitutionally guaranteed returns on approved infrastructure investments in exchange for servicing all within that territory at commission-regulated just and reasonable rates.[12] Only in recent decades, since deregulation created electricity markets, have derisking strategies become prevalent in energy infrastructure law.[13] Most notably, the U.S. federal government and states have successfully used derisking tools to promote renewable energy since the late 1970s.[14]

However, one of the most significant modern efforts at climate derisking has gone almost entirely unscrutinized: the attempted renaissance of carbon-free nuclear power in the United States over the last twenty years. The reason

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Hamilton's approach to building out early American infrastructure, where he theorized that "the public purse must supply the deficiency of private resource").

12 *See* Jersey Cent. Power & Light Co. v. Fed. Regul. Energy Comm'n, 810 F.2d 1168, 1189 (D.C. Cir. 1987) (Starr, J., concurring) ("The utility business represents a compact of sorts; a monopoly on service in a particular geographical area . . . is granted to the utility in exchange for a regime of intensive regulation, including price regulation, quite alien to the free market."); William Boyd, *Public Utility and the Low-Carbon Future*, 61 UCLA L. REV. 1614, 1619-20 (2014) (describing public utility as directing private enterprise towards public ends through the "creative force of law"); WILLIAM J. NOVAK, NEW DEMOCRACY: THE CREATION OF THE MODERN AMERICAN STATE 108-09 (2022) (tracing the significance of public utility law "for the future relationship of American polity and economy"); Aneil Kovvali & Joshua C. Macey, *The Corporate Governance of Public Utilities*, 40 YALE J. ON REGUL. 569, 573 (2023) (offering a contemporary take on what differentiates utilities' governance from other corporations); RICHARD F. HIRSH, POWER LOSS: THE ORIGINS OF DEREGULATION AND RESTRUCTURING IN THE AMERICAN ELECTRIC UTILITY SYSTEM 26 (1999) (describing utility "[o]bligations, [r]ights, and [b]enefits"). Electricity generation, transmission, and distribution and natural gas pipeline infrastructure have been predominantly developed through public utility regulation. *See* RICKS ET AL., *supra* note 11 pt. 4. Oil pipelines proceeded via common carrier regulation. *See id.* at 729.

13 *See* David B. Spence, *Can Law Manage Competitive Energy Markets?*, 93 CORNELL L. REV. 765, 767-74 (2008) (describing the shifts in electricity regulation creating markets); *see also infra* Part I for more on the distinction between "derisking" and traditional public utility regulation.

14 *See generally* Sarah Knuth, *Rentiers of the Low-Carbon Economy? Renewable Energy's Extractive Fiscal Geographies*, 55 ENV'T & PLAN. A: ECON. & SPACE 1548 (2023) (tracing the history of the U.S. wind production tax credit and solar investment tax credit); Pub. L. No. 102-486, § 1914, 106 Stat. 2776, 3020-23 (1992) (production tax credit for wind); Pub. L. No. 95-618, § 301, 92 Stat. 3174, 3194-201 (1978) (investment tax credit for solar and other technologies). Several scholars have scrutinized these tax credits, observing both their efficacy and their potential deleterious effects. *See, e.g.*, Felix Mormann, *Beyond Tax Credits: Smarter Tax Policy for a Cleaner, More Democratic Energy Future*, 31 YALE J. ON REGUL. 303, 308 (2014) (noting tax credits' efficacy at deploying wind and solar, although suggesting that their efficiency could be improved); Knuth, *supra* note 14, at 1557 ("Federal tax credits . . . are widely acknowledged as central supports for this fifteen-year boom [during the early 2000s]."); William Boyd, *Renewable Power: Who Will Own the Clean Energy Future?*, LPE PROJECT (June 6, 2023), https://lpeproject.org/blog/renewable-power-who-will-own-the-clean-energy-future [https://perma.cc/4NG4-YW5M] (crediting tax credits with the most climate progress since the 1990s); CONOR HARRISON, BROKERS OF POWER: FINANCE AND THE CHANGING U.S. ELECTRICITY SYSTEM (forthcoming) (manuscript at 144-45) (on file with authors) (discussing the utility and inefficiencies of investment tax credits).

that this project has received almost no academic attention and only brief, punctuated moments of media attention is because it was a serious disappointment.

After decades of nuclear industry stagnation, in the year 2000—as climate concerns and natural gas prices mounted—commentators boldly proclaimed that nuclear power had a "new lease on life."[15] Congress thereafter added several nuclear derisking tools to the federal Energy Policy Act of 2005.[16] In most places, these Congressional derisking initiatives proved too feeble to stimulate new investment. Only a few southern states—all of which retained traditional public utility regulation for electricity—seriously pursued new nuclear development. In these states, derisking strategies resulted in tens of billions of dollars of expenditures on an attempted nuclear power renaissance. Although one state, Georgia, is finally bringing two grossly overbudget new nuclear reactors into operation, other southern states spent money with no results to show.[17] Most egregiously, South Carolina now boasts two enormous holes in the ground at a price tag of around nine billion dollars.[18] Because of the legal structure of these states' derisking strategies, these costs have largely been borne by ratepayers, thereby adding considerable hardship to the lives of many who struggle to pay their electricity bills.[19]

At a moment where derisking has emerged as the predominant strategy to combat climate change in the United States and beyond, this Article interrogates how one of our most significant modern efforts to derisk clean energy went awry. To tell this story, the Article first traces attempts to restart nuclear power construction across four states: Georgia, South Carolina, Florida, and North Carolina. These four southern states present a range of outcomes that elucidates the challenges associated with a clean energy transition undergirded by derisking. Drawing from relevant legislation, administrative actions, court cases, news accounts, and interviews with key stakeholders, we reconstruct why and how these states attempted to revive nuclear power. This recent history reveals deep webs of legislative and administrative capture that drove questionable legal precommitments to certain nuclear projects, which then proved politically hard to abandon as sunk costs and mismanagement mounted. None of these projects would have

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15 Karin Schill, *Nuclear's New Lease on Life*, NEWS & OBSERVER (Feb. 1, 2000), https://www.oocities.org/~daburton/LLRW/News/newlease.html [https://perma.cc/24QR-UZYR].

16 *See infra* Section II.C.

17 *See infra* Part III.

18 *See* Akela Lacy, *South Carolina Spent $9 Billion to Dig a Hole in the Ground and Then Fill It Back In*, INTERCEPT (Feb. 6, 2019, 6:00 AM), https://theintercept.com/2019/02/06/south-caroline-green-new-deal-south-carolina-nuclear-energy [https://perma.cc/J7PX-5GPB] (describing South Carolina's nine billion dollar "nuclear boondoggle," "a project that's . . . just a giant hole in the ground . . . .").

19 *See infra* Table 2.

proceeded without states adding additional legal guarantees to initial federal derisking efforts. These measures then created their own ecosystem of interested parties that pushed for continued investment in nuclear power long beyond the point when investors in market-oriented regions would have abandoned ship.

After charting the varied courses of these southern states' experiences, we turn to consider what lessons the failed nuclear renaissance offers the significant project of derisking clean energy now underway in the United States and beyond. These lessons come at a critical time for nuclear policy in the United States. As recently as 2023, the consensus view was that the South's failed experiment in nuclear power "portend[ed] the end of large-scale nuclear construction in the [United States]."[20] Yet 2024 brought a bipartisan resurgence of interest in the technology, culminating in federal legislation that expedites advanced nuclear technology approvals and offers licensing fee reimbursements, among other things.[21] This law, which passed the Senate 88-2 and the House 393-13, marks nuclear energy as one of the few broad points of agreement in the modern U.S. Congress.[22]

In a gesture of optimism regarding the potential for continued nuclear support under changing presidential administrations, the Biden White House launched a post-2024-election roadmap outlining steps to triple domestic U.S. nuclear capacity by 2050.[23] The Biden Administration's Department of Energy also committed $3.2 billion in financing for advanced nuclear technologies.[24] Mounting nuclear enthusiasm also extends to the states: state

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20 Julian Spector, *Is the Biggest US Public Utility Finally Catching up on Clean Energy?*, CANARY MEDIA (July 26, 2023), https://www.canarymedia.com/articles/clean-energy/is-the-biggest-us-public-utility-finally-catching-up-on-clean-energy [https://perma.cc/7R9A-8FZQ].

21 *See generally* Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy Act (ADVANCE Act), Pub. L. No. 118-67, 138 Stat. 1448 (2024) (to be codified in various sections of 42 U.S.C.).

22 *All Information (Except Text) for S.870*, CONGRESS.GOV, https://www.congress.gov/bill/118th-congress/senate-bill/870/all-info (last visited Dec. 2, 2024); *see* Zachary P. Neal, *A Sign of the Times? Weak and Strong Polarization in the U.S. Congress, 1973–2016*, 60 SOC. NETWORKS 103, 110 (2020) (demonstrating increasing polarization in Congress).

23 *See generally* WHITE HOUSE, SAFELY AND RESPONSIBLY EXPANDING U.S. NUCLEAR ENERGY: DEPLOYMENT TARGETS AND A FRAMEWORK FOR ACTION (2024). This announcement built from a 2023 pledge signed by over twenty countries to triple the world's supply of nuclear energy. *See 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 [https://perma.cc/BV39-U72J].

24 *See* U.S. DEP'T OF ENERGY, PATHWAYS TO ADVANCED NUCLEAR COMMERCIAL LIFTOFF 17 (2024) (committing $3.2 billion in Department funds for the Advanced Reactor Demonstration Program, a cost-sharing program meant to derisk the development of innovative nuclear technologies such as sodium fast reactors and high temperature gas reactors), https://liftoff.energy.gov/advanced-nuclear [https://perma.cc/6J3M-W7BV].

legislatures reportedly considered around 200 nuclear-friendly energy bills in 2023, a huge increase over previous years.[25]

Despite these legal boosts, almost no one is building nuclear power today.[26] The story we tell of the South's recent experience with nuclear power explains why. At the same time, we argue that a richer understanding of the institutional and legal dynamics behind the South's nuclear woes offers broader lessons for climate policy. The IRA's derisking provisions for numerous clean energy technologies resemble the 2005 incentives that drove the failed nuclear renaissance.[27] That makes the lessons from the South's nuclear experiment broadly applicable to numerous emerging but risky clean energy technologies, including offshore wind; long-distance, high-voltage transmission lines; small modular nuclear reactors; green hydrogen; and carbon capture and storage.[28]

Although each of these technologies carries unique challenges that make analogizing necessarily inexact, there are similar risks that inhere in their development. We develop four categories of infrastructure development risks that the southern nuclear non-renaissance highlights: regulatory, scalar, temporal, and cultural risks.[29] Regulatory risks—that projects will be stymied by procedural or substantive legal requirements—compound financial risks to deter investments. Scalar risks manifest when sub-jurisdictions are prodded into assuming the risks of projects that pose high local costs even as they promise national benefits. Temporal risks inhere in projects that must justify themselves financially over long development periods against ever-changing relative prices in the sector. Finally, cultural risks arise when financial derisking tools spur their own ecosystems of additional supports for projects that may be against the public interest.

Altogether, we suggest that these multiple dimensions of project risk render a *financial* derisking approach—such as the one contained in the IRA—a limited method of driving the clean energy transition. Financial

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25 *See* Brian Martucci, *As States Increasingly Look to Advanced Nuclear, Wyoming, Virginia and Michigan Lead the Way*, UTIL. DIVE (Apr. 17, 2024), https://www.utilitydive.com/news/states-advanced-nuclear-smr-reactors-wyoming-virginia-michigan-lead/713422 [https://perma.cc/6X69-45P6].

26 *See Nuclear Power in the U.S.A.*, WORLD NUCLEAR ASS'N (Aug. 27, 2024), https://world-nuclear.org/information-library/country-profiles/countries-t-z/usa-nuclear-power [https://perma.cc/D3XZ-JT7X] (showing zero reactors under construction).

27 *See infra* Part I.

28 *See infra* Part IV.

29 *See infra* Part IV. We join many scholars and policymakers in identifying regulatory risks as a core impediment to clean energy buildout. *See generally, e.g.*, GABOR, *supra* note 6; J.B. Ruhl & James Salzman, *The Greens' Dilemma: Building Tomorrow's Climate Infrastructure Today*, 73 EMORY L.J. 1 (2023); Michael B. Gerrard, *Legal Pathways for a Massive Increase in Utility-Scale Renewable Generating Capacity*, 47 ENV'T L. REP. NEWS & ANALYSIS 10591 (2017). Less attention has been paid to other sorts of risks.

derisking creates an uncoordinated and capital-driven mode of clean energy infrastructure development.[30] Once mediated through the vagaries of energy markets, such incentive-based policies frequently do not produce the profit assurances required to drive investment at the necessary scope or scale.[31] Moreover, an incentive-based approach presents distinct problems for managing the electricity grid as an integrated *system*—a system whose reliability remains the economic and social backbone of modern society. Far more direct public control over this infrastructural transformation is likely necessary to realize the scope of change that both federal policy and fundamental scientific imperatives demand.[32] Yet the South's unsuccessful experiments in deploying public utility law to manage nuclear development also suggest that more care must be taken in designing and equipping public managers of the energy transition.

In drawing out these lessons, this Article advances a burgeoning conversation about the rise of "green industrial policy" to address climate change.[33] Several scholars of this pivot have highlighted the need for more

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30 *See* Daniela Gabor, *The Wall Street Consensus*, 52 DEV. & CHANGE 429, 432 (2021) (arguing that derisking promotes development without any "autonomous strategic vision, unless 'more infrastructure' can be described as such").

31 In a recent book, Brett Christophers makes a similar set of observations with respect to solar and wind policies' failure to incent adequate profits. *See generally* BRETT CHRISTOPHERS, THE PRICE IS WRONG: WHY CAPITALISM WON'T SAVE THE PLANET (2024).

32 *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2022: MITIGATION OF CLIMATE CHANGE 23 (2022), https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_SummaryForPolicymakers.pdf [https://perma.cc/6NQ8-GXZ4] (concluding that global emissions must reach net zero by the 2050s–70s to avert catastrophic levels of warming); Press Release, White House, Fact Sheet: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies (Apr. 22, 2021), https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies [https://perma.cc/8M3F-3GGB] (establishing as U.S. executive policy targets of 100% clean electricity by 2035 and "net zero emissions economy-wide by no later than 2050").

33 *See, e.g.*, Dani Rodrik, *Green Industrial Policy*, 30 OXFORD REV. ECON. POL'Y 469 (2014) (reviewing the theoretical case for industrial policy that encourages investment in green infrastructure and suggesting improvements to current practice); Jonas Meckling, *Making Industrial Policy Work for Decarbonization*, 21 GLOB. ENV'T POLS. 134 (2021) (highlighting the shift of environmental legislation from environmental policy to industrial policy, and contrasting their differences in tackling decarbonization goals); Daniel Walters, *Tomorrow's Climate Law, Today*, 58 U.C. DAVIS L. REV. (forthcoming 2025), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4750208 (discussing the promise and limits of green industrial policy); ROOSEVELT INST., INDUSTRIAL POLICY SYNERGIES: REFLECTIONS FROM BIDEN ADMINISTRATION ALUMNI 5 (2023) ("We are in an industrial policy moment."); Karl Aiginger & Dani Rodrik, *Rebirth of Industrial Policy and an Agenda for the Twenty-First Century*, 20 J. INDUS., COMPETITION & TRADE 189 (2020) (discussing the potential reasons behind a resurgence in industrial policy on both ends of the political spectrum); Amy Kapczynski & Joel Michaels,

interrogation of "what makes good green industrial policy."[34] We theorize fiscal derisking as a particular mode of green industrial policy whose risks the nuclear case study illuminates. And we offer a critical *legal* lens into derisking tools, focusing on the institutions and governance constructs that determine their shape and execution.[35] To probe these aspects of derisking, this project attends carefully to how the relationships among utilities, commissions, legislatures, developers, and civil service groups contributed to the South's failed nuclear renaissance. In doing so, we draw from the growing energy geography scholarship on "electricity capital"—that is, "the nexus of state, regulatory, and financial relationships that shape private accumulation through electricity provision."[36] Importing this scholarship helps illuminate how current policy efforts fit into, and are shaped by, the contested political economy of the energy transition.[37]

Despite its limitations, the IRA remains the best compromise that could be struck on climate legislation under present political constraints. Moreover, its relatively light-touch, developer-forward approach to climate policy may provide it durability through presidential administrations with highly divergent opinions on climate regulation.[38] Whatever this particular act's fate, it is our hope that an understanding of how derisking tools have played out in past experiments—to wit, the unsuccessful nuclear renaissance—may

Administering a Democratic Industrial Policy, 18 HARV. L. & POL'Y REV. 279, 280 (2024) (noting the "remarkable resurgence" of green industrial policy interest in the United States).

34 Meckling, *supra* note 33, at 142; *see also* Aiginger & Rodrik, *supra* note 33, at 191 (asking similar questions); ROOSEVELT INST., *supra* note 33, at 6 ("[H]ow can macroeconomic policy, climate policy, trade policy, labor policy, inclusion policy, and competition policy help make better industrial policy, and vice versa?").

35 *Cf.* Baker, *supra* note 6, at 1758 (identifying a need for "critical policy analysis to further investigate the politics of the negotiation of electricity regulation and procurement processes that ultimately enable these assets to develop"); *see generally* KATHARINA PISTOR, THE CODE OF CAPITAL: HOW THE LAW CREATES WEALTH AND INEQUALITY (2019) (tracing the importance of "legal coding" to creating asset value, wealth, and its distribution).

36 Nikki Luke & Matthew T. Huber, *Introduction: Uneven Geographies of Electricity Capital*, 5(4) ENV'T & PLAN. E: NATURE & SPACE 1699, 1700 (2022).

37 *See* Christophers, *supra* note 6, at 1522 (addressing the importance of political economy to energy transition policymaking and highlighting the analytical value of the profit-centric perspective of Marxian political economy); *cf.* Jedediah Britton-Purdy, David Singh Grewal, Amy Kapczynski & K. Sabeel Rahman, *Building a Law-and-Political-Economy Framework: Beyond the Twentieth-Century Synthesis*, 129 YALE L.J. 1784, 1792 (2020) (arguing for a "law and political economy" approach to legal scholarship).

38 *See* Seth Borenstein, *Experts Worry Trump's Second Term Will Cripple Efforts to Stop Climate Change*, PBS NEWS (Nov. 8, 2024, 10:58 AM), https://www.pbs.org/newshour/politics/experts-worry-trumps-second-term-will-cripple-efforts-to-stop-climate-change [https://perma.cc/XHN2-ZFEX] (documenting plans for the incoming administration to withdraw from international climate diplomacy efforts); Coral Davenport & Lisa Friedman, *What Trump's Victory Means for Climate Change*, N.Y. TIMES (Nov. 6, 2024), https://www.nytimes.com/2024/11/06/climate/trump-climate-change.html [https://perma.cc/LW6V-3CVP] (detailing why it might be difficult to repeal the IRA even if the incoming administration does not support it).

inform conversations about the future shape of U.S. climate policy, if and when it is back on the legislative agenda. Our analysis points the way toward a layered set of policy solutions that could build upon and complement derisking initiatives to achieve further climate progress. It also counsels careful attention to public administration as the key space for ensuring as much coordination of the energy transition as is possible under derisking approaches to climate policy.[39]

Before proceeding, we want to acknowledge the complexities of nuclear power's role in the "clean energy" transition. Nuclear power is carbon-free but far from risk-free, as occasional catastrophic reactor meltdowns and the ongoing challenges of nuclear waste storage and nuclear non-proliferation remind us.[40] This article does not litigate nuclear power's safety, largely because southern states' decisions around nuclear scarcely considered this angle.[41] Moreover, we remain agnostic about how large a role nuclear energy should play in the clean energy transition.[42] Instead, we are interested in the broader lessons that the South's failed nuclear renaissance offers about how to decarbonize the U.S. energy system quickly, effectively, and fairly across decarbonization technologies carrying hefty potential risks and rewards.

This Article proceeds in four parts. Part I provides a conceptual overview of climate derisking and describes how the IRA embraces this strategy. Part II introduces the legal regime governing electricity in the United States and provides background on nuclear power development. Part III presents our descriptive analysis of the failed early twenty-first century nuclear renaissance. Part IV considers what lessons this failure offers for scholars and policymakers of the energy transition as the United States attempts to decarbonize via derisking in the wake of nuclear power's failure to relaunch.

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39 *See infra* Section IV.B.

40 *See* Bruce R. Huber, *Checks, Balances, and Nuclear Waste*, 48 ARIZ. ST. L.J. 1169, 1171-73 (2016) (noting that over-complexity in the Nuclear Waste Policy Act of 1982 has left it inert and led to a growing nuclear waste storage issue in the United States).

41 That is not to say that there have not been safety challenges at southern nuclear reactors—far from it. *See, e.g.*, Sammy Fretwell, '*Substantial*' *Safety Violation Alleged at SC Nuclear Plant After 20 Years of Problems*, STATE (Oct. 7, 2023, 1:05 PM), https://www.thestate.com/news/local/environment/article280228714.html [https://perma.cc/J3KS-FGWU] (chronicling twenty years of ignored safety challenges at South Carolina's Plant Vogtle). But public outrage over nuclear in southern states centered on cost challenges, rather than the safety or geopolitical impacts of the technology. *See infra* Part III.

42 *See infra* Part IV.

I. A CONCEPTUAL INTRODUCTION TO CLIMATE DERISKING

A state that aims to develop infrastructure has numerous policy tools at its disposal. The state can build, own, and operate the infrastructure itself.[43] It can contract out the building and/or operation of the infrastructure but maintain ownership.[44] Or the state can turn to a range of tools to entice private entities to build the infrastructure it desires, from subsidies to tax breaks, guarantees of certain returns or profits, or exclusive franchises to serve certain locales.[45] Sometimes, these enticements are accompanied by certain reciprocal obligations on the part of providing entities, such as under a public utility model that imposes rate regulation, a duty to serve, and quality of service obligations on regulated monopoly providers.[46]

The United States' expansive electricity infrastructure has been developed through a combination of these strategies. In the early days of electricity, private companies contracted directly with businesses and wealthy residents to locally supply power.[47] As the industry grew in the early twentieth century, municipal ownership competed with a private franchise model in vociferous battles across the country.[48] By the middle part of that century, most states had adopted a public utility model of electricity governance, grounded in commission oversight of investor-owned utilities.[49] But rural electrification required a different strategy, and the United States used large-scale public ownership models such as the Tennessee Valley

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43 *See* Shelley Welton, *Public Energy*, 92 N.Y.U. L. REV. 267, 270-71 (2017); Alan Richardson & John Kelly, *The Relevance and Importance of Public Power in the United States*, 19 NAT. RES. & ENV'T 54, 54 (2005) (discussing the history and benefits of public power systems—utilities owned and operated by local governments—in the United States). *See generally* HENRY HANSMANN, THE OWNERSHIP OF ENTERPRISE (1996) (theorizing the prevalence of non-investor-owned enterprises in a range of industries across the United States, including electricity provisioning); GANESH SITARAMAN & ANNE L. ALSTOTT, THE PUBLIC OPTION (2019) (exploring the role that public alternatives can play in transforming, opening, and disciplining sectors).

44 *See, e.g.*, John D. Donahue, *The Transformation of Government Work: Causes, Consequences, and Distortions*, *in* GOVERNMENT BY CONTRACT: OUTSOURCING AND AMERICAN DEMOCRACY 41, 44 (Jody Freeman & Martha Minow eds., 2009); Paul R. Verkuil, *Public Law Limitations on Privatization of Government Functions*, 84 N.C. L. REV. 397, 399 (2006) (underlining the rapid growth in "[t]he number of private contractors doing the work of government"); *cf.* William J. Novak, *Public-Private Governance: A Historical Introduction*, *in* GOVERNMENT BY CONTRACT: OUTSOURCING & AMERICAN DEMOCRACY 23, 33 (Jody Freeman & Martha Minow eds., 2009) (arguing for a role for both public and private development so that each may check the other).

45 *See* RICKS ET AL., *supra* note 11, at 24-30 (providing an overview of the government's regulatory toolkit); Christophers, *supra* note 6, at 1521 ("Ultimately, the state has a basic choice. Either it can do essential things . . . [o]r it can rely on the private sector to do those things."); Hughes v. Talen Energy Mktg., LLC, 578 U.S. 150, 153 (2016) (considering a Maryland law that used incentives to induce new gas generation to locate in the state).

46 *See* JAMES C. BONBRIGHT, PRINCIPLES OF PUBLIC UTILITY RATES 33 (1961).

47 *See* Welton, *supra* note 43, at 285-88.

48 *Id.*

49 *Id.* at 288.

Authority to accomplish this goal.[50] Even today, the U.S. electricity grid remains owned and controlled by a hodge-podge of private and public entities.[51]

Perhaps never before, however, has the imperative for electricity infrastructure development been more pressing. The ravages of climate change have been on full display in record-breaking recent summers, which have spread unprecedented heat, fires, floods, hurricanes, locusts, and more to various corners of the globe.[52] One of the core strategies for responding to this crisis is to electrify everything, from heating to cooking to industrial processes, while transforming the electricity sector to run entirely on clean energy sources.[53] Experts calculate that if this strategy is pursued aggressively (as both federal and numerous state policies are attempting to do), electricity demand may almost double by 2035 and could triple by 2050.[54] Meeting this demand will require a massive clean energy infrastructure buildout. Clean energy generation, especially wind and solar, will have to be installed "at an unprecedented rate."[55] In addition, the system will need increased and enhanced transmission infrastructure to move this new electricity, storage resources to hold it, and additional technologies to balance the intermittency of renewables—potentially including carbon capture and storage, nuclear, or hydrogen-fueled combustion turbines.[56]

The rapid infrastructure expansion and transformation demanded by climate change creates an opportunity to experiment anew with infrastructure policy. New York State, for example, has recently adopted legislation to

50 *See* Knuth, *supra* note 14, at 1554; Tennessee Valley Authority Act of 1933, ch. 32, 48 Stat. 58 (1933); Rural Electrification Act of 1936, ch. 432, 49 Stat. 1363 (1936) (creating a federal agency capable of dispersing loans for rural electrification).

51 *See* Welton, *supra* note 43, at 290; *see also* Anodyne Lindstrom & Sara Hoff, *Investor-Owned Utilities Served 72% of U.S. Electricity Customers in 2017*, U.S. ENERGY INFO. ADMIN. (Aug. 15, 2019), https://www.eia.gov/todayinenergy/detail.php?id=40913 [https://perma.cc/9JN4-T5W7].

52 *See, e.g.*, Noah Berman & Sabine Baumgartner, *The Weather of Summer 2023 Was the Most Extreme Yet*, COUNCIL ON FOREIGN RELS. (Sept. 18, 2023), https://www.cfr.org/article/weather-summer-2023-was-most-extreme-yet [https://perma.cc/AT6G-4V6G]; Christopher Flavelle, *Record Number of Billion-Dollar Disasters Shows the Limits of America's Defenses*, N.Y. TIMES (Sept. 15, 2023), https://www.nytimes.com/2023/09/12/climate/billion-dollar-disasters.html [https://perma.cc/DPB4-6NQF]; Austyn Gaffney, *2024 On Track to Be the Hottest Year on Record*, N.Y. TIMES (Aug. 12, 2024), https://www.nytimes.com/2024/08/08/climate/heat-records-2024.html [https://perma.cc/C9X9-N3FX].

53 *See* sources cited *supra* note 1.

54 *See* PAUL DENHOLM, PATRICK BROWN, WESLEY COLE, TREU MAI, BRIAN SERGI, MAXWELL BROWN, PAIGE JADUN, JONATHAN HO, JACK MEYERNIK, COLIN MCMILLAN & RAGINI SREENATH, NAT'L RENEWABLE ENERGY LAB'Y, EXAMINING SUPPLY-SIDE OPTIONS TO ACHIEVE 100% CLEAN ELECTRICITY BY 2035 4 (2022), https://www.nrel.gov/docs/fy22osti/81644.pdf [https://perma.cc/HA83-LXFL] (presenting three 2035 electricity demand trajectories); NAIMOLI & LADISLAW, *supra* note 2, at 2.

55 DENHOLM ET AL., *supra* note 54, at 21.

56 *Id.* at 25.

promote considerably more public ownership of renewable energy as part of its strategy for tackling climate change.[57] Some decarbonization proponents are also pushing for greater use of cooperative ownership forms to boost small-scale renewable energy generation.[58] However, these efforts remain scattered and challenging.

As Daniella Gabor compellingly argues, the dominant strategy for contemporary climate-related infrastructure development has been one of "derisking" private investment.[59] Gabor defines a derisking state as one whose approach to green infrastructure development centers on "enlist[ing] private capital into achieving public policy priorities by tinkering with risk/returns on private investments . . . ."[60] Essentially, the theory of derisking is that if the state sends signals to the market that lower investment risks, asset managers will respond by steering funds towards these state priorities.[61] Gabor further theorizes two different categories of derisking: "fiscal" derisking, which focuses on making rates of return and payoff periods more enticing for investors through state funding; and "regulatory" derisking, which attempts to remove regulatory obstacles that increase the risk of delay or litigation for infrastructure projects.[62] Gabor includes within the "derisking" category of state action the "public private partnerships" model for building infrastructure that "guarantees financiers a minimum return without extracting any substantive commitments in return, and de facto privatizes infrastructure . . . ."[63]

Gabor contrasts these "derisking" approaches to infrastructure development with what she calls the "Big Green State" model, which involves "[s]tate directed decarbonisation" and "state ownership of low-carbon infrastructure."[64] She also situates between these strategies one of "[s]tate directed industrial upgrade," in which there are more extensive "institutions and mechanisms to discipline private capital."[65]

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57 *See* N.Y. PUB. AUTH. LAW § 1005(27-a) (McKinney 2024) (authorizing the state's public power provider to build and own renewables and requiring it to phase out fossil fuels).

58 *See* Alexandra B. Klass & Gabriel Chan, *Cooperative Clean Energy*, 100 N.C. L. REV. 1, 7 (2021) (emphasizing seven principles to guide the clean energy transition in rural electric cooperatives).

59 GABOR, *supra* note 6, at 6.

60 *Id.* at 1.

61 *Id.* at 2; *cf.* Brett Christophers, *The Role of the State in the Transfer of Value from Main Street to Wall Street: US Single-Family Housing After the Financial Crisis*, 54 ANTIPODE 130, 132-33 (2022) (discussing regulatory derisking strategies with respect to housing).

62 *See* GABOR, *supra* note 6, at 2 (describing "regulatory derisking" as "remov[ing] regulatory barriers to investibility in new asset classes" and "fiscal derisking" as "shift[ing] demand, political or climate risks from the private sector to public balance sheets").

63 *Id.* at 11.

64 *Id.* at 19; *see infra* Table 1.

65 GABOR, *supra* note 6, at 19; *see infra* Table 1.

Notably absent from Gabor's typology is one of the predominant means of derisking in U.S. energy policy over the last century: public utility law. Public utility law has long been explicitly derisking in aim, intended in part to attract capital to utilities by lowering the associated financial risks.[66] In exchange, as noted above, utilities submit to commission oversight of their rates, long-term infrastructure plans, and service quality.[67] Public utility thus serves as an additional mechanism of harnessing private entities to serve public objectives—one that demands more of its private partners. Notably, this model features prominently in the story of the failed nuclear renaissance.

Every means of infrastructure development catalogued above (and below in Table 1) can, in some sense, be thought of as "derisking" in its objectives—if the risk is that otherwise the socially desirable project does not get built. The Big Green State essentially insources *all* risk. The "state-directed industrial upgrade" funnels grant money to selected projects on state-directed terms and thus attracts private partners and investors. Public utility law creates a "compact of sorts"[68] between utilities and the government built around reciprocal obligations that include limiting financial risk.[69]

In keeping with Gabor's terminological choices, we refer throughout this article to "fiscal derisking" as a term of art that refers specifically to strategies that offer tax credits or analogous public payments to privately owned entities as a means of inducing infrastructure development. But we pay more attention to Gabor regarding the substantial gradations between a "Big Green State" approach to infrastructure development and a pure fiscal derisking approach. As Table 1 below suggests, we see "derisking typologies" as existing on a spectrum from maximum state control via full government ownership down to minimum state control via fiscal derisking.[70]

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66 *See* Jersey Cent. Power & Light Co. v. Fed. Energy Regul. Comm'n, 810 F.2d 1168, 1178 (D.C. Cir. 1987) (explaining that reviewing courts must ensure that public utility rate determinations "may reasonably be expected to 'maintain financial integrity' and 'attract necessary capital'"); Boyd, *supra* note 12, at 1643 ("At its core, public utility regulation thus provided a means for utilities to secure capital at lower cost and to channel it into very large technological systems.").

67 *See supra* note 46 and accompanying text.

68 *Jersey Cent. Power & Light Co.*, 810 F.2d at 1189.

69 *See infra* notes 154–158 and accompanying text for more on the constitutional dimensions of limiting risk in public utility law.

70 *Accord* Kapczynski & Michaels, *supra* note 33, at 316 (describing industrial policy as existing along "a continuum of administrative control: on one end is arms-length contracting, and on the other direct government ownership").

Table 1: Climate Derisking Typologies in Descending Order of State Control[71]

Type	Subtypes	Example(s)
Government Ownership & Control	Government ownership	Gabor's "Big Green State"; Tennessee Valley Authority
	Government decarbonization mandates	State 100% clean energy mandates on load-serving entities
Public Utility Law	Traditional commission-overseen rate regulation	Cost-of-service cost recovery provisions; integrated resource planning to guide infrastructure development
	RTO/electricity markets model	Central dispatch and engineered markets for electricity and related products
'Gaborean' State-Directed Industrial Upgrades		IIJA's hydrogen hubs and carbon capture and storage hubs
'Gaborean' Derisking	Public-private partnerships	Santee Cooper's stake in VC Summer (S.C.); northern states' offshore wind subsidies
	Regulatory derisking	Permitting reform efforts; South Carolina's Base Load Review Act; Price-Anderson Act for nuclear liability
	Fiscal Derisking	Inflation Reduction Act clean energy tax credits; Energy Policy Act of 2005 nuclear credits

The IRA's climate and energy provisions largely fit a fiscal derisking model—i.e., the least state-directed method of building clean energy infrastructure.[72] Dollars-wise, tax credits form the largest component of the IRA, with estimates projecting that the federal government will spend somewhere between $400 billion and $1.2 trillion on IRA tax credits over the

71 Our figure is an adaptation and extension of that presented by GABOR, *supra* note 6, at 19, with thanks for her generative framework.

72 *Id.* at 6 (describing the IRA as a "massive scale-up of fiscal derisking").

next ten years.[73] These tax credits are directed at a range of "clean energy" industries, including renewable energy (wind and solar), energy storage, carbon capture and storage, "green" hydrogen, electric vehicles, and nuclear.[74] Clean electricity tax credits are awarded on either a per-production-unit basis or an investment basis, with developers frequently able to select between the two.[75]

The IRA does include "conditionalities" that enhance the value of its tax credits if developers meet certain terms that reflect ancillary goals of the Act.[76] Notably, the tax credits increase if the developer meets certain labor requirements regarding apprenticeships and prevailing wages, invests in low-income or historically energy-extraction-heavy communities, or domestically manufactures key technology components.[77] As Gabor explains, the total investment tax credit available to private developers who meet all of the available conditions shifts from six percent (the rate with no bonuses) to "a staggering 70% of upfront investments costs."[78] These are creative mechanisms for attempting to layer social policy objectives into clean energy policy by counteracting some of the additional costs these social objectives

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73 *See* Saul, *supra* note 9.

74 The IRA contains a technology-neutral subsidy for new carbon-free energy generation beginning in 2025, including renewable energy, of either $27.50/MWh for the first ten years of operation or a thirty percent investment tax credit provided that certain prevailing wage and apprenticeship requirements are met. *See Inflation Reduction Act Tax Credit Opportunities for Hydropower and Marine Energy*, U.S. DEP'T OF ENERGY tbls.1 & 2, https://www.energy.gov/eere/water/inflation-reduction-act-tax-credit-opportunities-hydropower-and-marine-energy#:~:text=The%20current%20base%20PTC%20value,10%20years%20of%20electricity%20production [https://perma.cc/DT65-HMJM] (last visited Nov. 29, 2024); I.R.C. § 45Y (IRA production credit); I.R.C. § 48E (IRA investment credit); *see also Overview of Inflation Reduction Act Incentives for Federal Decarbonization*, U.S. DEP'T OF ENERGY, https://www.energy.gov/femp/overview-inflation-reduction-act-incentives-federal-decarbonization [https://perma.cc/9MFR-L9YS] (last visited Nov. 29, 2024) (providing an overview of the technologies eligible for the production and investment credits). Advanced nuclear technologies are eligible for a credit of 1.8 cents per kilowatt hour. *See* I.R.C. § 45J. The clean hydrogen tax credit is awarded on a per-kilogram basis, with rates varying depending on lifecycle greenhouse gas emissions rates. *See* I.R.C. § 45V(c)(2). Carbon capture and sequestration technologies are subsidized on a per-ton basis, with direct air capture receiving additional dollars per ton. *See* I.R.C. § 45Q.

75 *See Clean Energy Tax Provisions in the Inflation Reduction Act*, WHITE HOUSE, https://www.whitehouse.gov/cleanenergy/clean-energy-tax-provisions [https://perma.cc/9YMF-JU8Q] (last visited Nov. 29, 2024) (delineating eligible recipients of various tax credits).

76 *See* ISABEL ESTEVEZ, ROOSEVELT INST., MULTI-SOLVING, TRADE-OFFS, AND CONDITIONALITIES IN INDUSTRIAL POLICY 6 (2023) (describing how "conditionalities" attached to industrial policy shape how goods and services are produced, on matters from labor and accountability to environmental quality and justice).

77 I.R.C. § 45Y(b)(7)–(11).

78 GABOR, *supra* note 6, at 18; *see also* I.R.C. § 48E (specifying the individual bonuses available where different conditions are met).

impose on projects through tax credits.[79] Nevertheless, they are far from a guarantee of achieving such objectives: whether developers choose to tap into these incentives and thus help promote redistribution, good jobs, and a just transition will depend on whether they consider it cost-competitive to do so.[80]

Absent from the IRA are some of the *regulatory* derisking measures pushed by certain negotiators. It appeared for some time that several "permitting reform" measures might make it into the deal, intended to ease the path for environmental approvals of energy infrastructure projects, renewable and fossil fuel alike.[81] Progressive resistance to these broadly deregulatory proposals ultimately kept them out, although later budget negotiations resulted in some permitting reforms.[82]

The IRA is complemented by the Infrastructure Investment and Jobs Act (IIJA)—also known as the Bipartisan Infrastructure Law—passed nearly a year earlier.[83] That law provides federal grants to a range of clean energy technologies, including clean hydrogen production and carbon capture and storage.[84] These grant-based mechanisms are also directed toward spurring private capital investments,[85] though the grant structure provides awarding agencies more control of who is awarded money as compared to the IRA's

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79 *See* Estevez, *supra* note 76, at 5-6; Kapcyznski & Michaels, *supra* note 33, at 337 (noting that the IRA's "kinds of labor provisions are unprecedented as applied to tax credits").

80 *See* GABOR, *supra* note 6, at 18.

81 *See* Colin Mortimer, *Manchin's Permitting Reform Effort Is Dead. Biden's Climate Agenda Could Be a Casualty*, VOX (Dec. 16, 2022, 12:04 PM), https://www.vox.com/policy-and-politics/2022/12/12/23500140/permitting-reform-inflation-reduction-act-congress-manchin [https://perma.cc/KT2B-NNFU] (describing failed attempts at permitting reform championed by Senator Joe Manchin of West Virginia). Congress did later pass minor permitting reform provisions in the 2023 debt ceiling legislation. *See* Michael Catanzaro, *Permitting Reform in the Debt Ceiling Bill: A First Step, with More to Come*, CTR. FOR STRATEGIC & INT'L STUD. (June 7, 2023), https://www.csis.org/analysis/permitting-reform-debt-ceiling-bill-first-step-more-come [https://perma.cc/8UJJ-GU6S] (describing the NEPA reforms passed in the debt ceiling legislation).

82 *See generally* JOHANNA BOZUWA & DUSTIN MULVANEY, ROOSEVELT INST., A PROGRESSIVE TAKE ON PERMITTING REFORM: PRINCIPLES AND POLICIES TO UNLEASH A FASTER, MORE EQUITABLE GREEN TRANSITION (2023), https://rooseveltinstitute.org/publications/a-progressive-take-on-permitting-reform [https://perma.cc/EQV6-9C73] (arguing against the proposition that the way to accelerate renewable energy buildout is "to 'cut red tape' and 'reduce bureaucracy'").

83 Pub. L. No. 117-58, 135 Stat. 429 (2021) (to be codified at 23 U.S.C. § 101).

84 *See, e.g.*, *id.* § 40314, 135 Stat. at 1008 (regional clean hydrogen hubs); *id.* § 41004, 135 Stat. at 1128 (carbon capture demonstration projects).

85 *See* Press Release, White House, Biden-Harris Administration Announces Regional Clean Hydrogen Hubs to Drive Clean Manufacturing and Jobs (Oct. 13, 2023), https://www.whitehouse.gov/briefing-room/statements-releases/2023/10/13/biden-harris-administration-announces-regional-clean-hydrogen-hubs-to-drive-clean-manufacturing-and-jobs [https://perma.cc/U3AN-DR67] (describing how the hydrogen hub provisions will "catalyze more than $40 billion in private investment").

self-claimable tax credits.[86] That brings the IIJA's design closer to a model of state-directed industrial upgrades, rather than a pure derisking approach.[87] We return to consider why this distinction matters as we derive lessons in Part IV.

It is worth emphasizing how different the approach to climate change policy adopted by the IRA and IIJA is from the design of previous efforts at major federal climate legislation. Most economists and aligned policymakers have long championed a carbon tax as the best way to drive decarbonization by sending a reverberating signal through markets that carbon is costly.[88] Accordingly, Congress has considered numerous legislative variations on carbon pricing over the past several decades.[89] But a broad-based carbon tax has been notoriously difficult to pass in the United States.[90] The IRA contains almost nothing like a carbon tax, save one small provision related to methane.[91] What's more, scholars have begun to question whether a carbon tax, standing alone, could ever drive decarbonization at the scale and pace necessary.[92]

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86 *See, e.g.*, § 40210(d), 135 Stat. at 982 (setting critical minerals grant caps but delegating authority over awards allocation to the Secretary of the National Science Foundation).

87 *See* GABOR, *supra* note 6; *see also supra* Table 1.

88 *See* David Klenert, Linus Mattauch, Emmanuel Combet, Ottmar Edenhofer, Cameron Hepburn, Ryan Rafaty & Nicholas Stern, *Making Carbon Pricing Work for Citizens*, 8 NATURE CLIMATE CHANGE 669, 669 (2018) (characterizing carbon pricing as an "indispensable strategy" with which to tackle climate change); Shi-Ling Hsu, *A Complete Analysis of Carbon Taxation: Considering the Revenue Side*, 65 BUFF. L. REV. 857, 861 (2017) (noting "extremely broad consensus" on efficiency, effectiveness, and administrability of a broad-based carbon tax).

89 *See* Amber Phillips, *Congress's Long History of Doing Nothing on Climate Change, in 6 Acts*, WASH. POST (Dec. 1, 2015, 11:15 AM), https://www.washingtonpost.com/news/the-fix/wp/2015/12/01/congresss-long-history-of-inaction-on-climate-change-in-6-parts [https://perma.cc/9TQL-KPX2] (describing attempts at passing cap and trade legislation).

90 *See generally* Jesse D. Jenkins, *Political Economy Constraints on Carbon Pricing Policies: What Are the Implications for Economic Efficiency, Environmental Efficacy, and Climate Policy Design?*, 69 ENERGY POL'Y 467 (2014) (discussing numerous challenges to the passage of a carbon tax).

91 *See Methane Emissions Reduction Program*, U.S. ENV'T PROT. AGENCY (Nov. 21, 2024), https://www.epa.gov/inflation-reduction-act/methane-emissions-reduction-program [https://perma.cc/MT5N-RTXA] (describing how the IRA delegated authority to the EPA to price methane emissions).

92 Skanda Amarnath, Melanie Brusseler, Daniela Gabor, Chirag Lala, & JW Mason, *Varieties of Derisking*, PHENOMENAL WORLD (June 17, 2023), https://www.phenomenalworld.org/interviews/derisking [perma.cc/UQK2-23YH] (describing evolving thinking around decarbonization as "an investment challenge"); John Van Reenen, *The Case for Green Industrial Policy*, PROMARKET (Feb. 14, 2023), https://www.promarket.org/2023/02/14/the-case-for-green-industrial-policy [https://perma.cc/JY6B-D7SA] ("[T]here are good theoretical reasons why technological subsidies should be part of the policy mix"); Jessica F. Green, *Does Carbon Pricing Reduce Emissions? A Review of Ex-Post Analyses*, 16 ENV'T RSCH. LETTERS 1, 2 (2021) ("[T]here is little evidence to suggest that carbon pricing promotes decarbonization."); DANNY CULLENWARD & DAVID G. VICTOR, MAKING CLIMATE POLICY WORK 35 (2020) (discussing the political challenges inherent in a carbon tax and the resulting difficulties in implementation).

The IRA pursues a markedly different strategy, often called "green industrial policy" or "Bidenomics."[93] We think it important to distinguish between these broader umbrella terms and the concept of derisking. In a speech laying out the pillars of Biden's industrial policy approach, then-National Economic Council Director Brian Deese described this policy as "a strategy to strengthen our supply chains and rebuild our industrial base, across sectors, technologies, and regions."[94] Industrial policy of this sort could—coming back to our typology—be done through a variety of channels, including direct public investment and public ownership.[95] The IRA does some of each of these. For example, it makes it easier for municipal utilities and electric cooperatives to access renewable energy subsidies through a set of provisions known as "elective pay" or "direct pay,"[96] and it allocates around forty-six billion dollars to spending on environmental justice, including a revolving fund to invest in state and local green banks.[97]

However, these provisions *pale* in comparison to its central strategy of enticing private finance to loan more money to clean energy developers by lowering the risk of doing so. An analysis by McKinsey and Company found that *if* spending is limited to the $394 billion projected by the Congressional Budget Office, then $216 billion (more than half) will go to corporate tax incentives.[98] If, however, corporations take advantage of these tax credits at

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93 *See*, *e.g.*, Paul Krugman, *How to Think About Green Industrial Policy*, N.Y. TIMES (May 9, 2023), https://www.nytimes.com/2023/05/09/opinion/climate-inflation-reduction-act-biden.html [https://perma.cc/95SR-QCR5]; Press Release, White House, Bidenomics Is Working: The President's Plan Grows the Economy from the Middle Out and Bottom Up—Not the Top Down (June 28, 2023), https://www.whitehouse.gov/briefing-room/statements-releases/2023/06/28/bidenomics-is-working-the-presidents-plan-grows-the-economy-from-the-middle-out-and-bottom-up-not-the-top-down [https://perma.cc/3M8Z-7TPZ]. *See generally* Rodrik, *supra* note 33.

94 Brian Deese, Dir., Nat'l Econ. Council, Address at the Atlantic Council (June 23, 2021), https://www.atlanticcouncil.org/commentary/transcript/the-biden-white-house-plan-for-a-new-us-industrial-policy [https://perma.cc/3PH3-RX66].

95 *See* Boyd, *supra* note 14 (highlighting the stakes of renewable energy ownership choices).

96 *See generally* INTERNAL REVENUE SERV., DEP'T OF THE TREASURY, PUB. NO. 5817, ELECTIVE PAY OVERVIEW (2024), https://www.irs.gov/pub/irs-pdf/p5817.pdf [https://perma.cc/K3X7-R7BV]; Chirag Lala, CTR. FOR PUB. ENTER., DIRECT PAY: AN UNCAPPED PROMISE OF THE INFLATION REDUCTION ACT (2023), https://publicenterprise.org/wp-content/uploads/Direct-Pay-101-Center-for-Public-Enterprise-p5fp.pdf [https://perma.cc/S7NW-CNJ4].

97 Manann Donoghoe, Andre M. Perry & Hannah Stephens, *The US Can't Achieve Environmental Justice Through One-Size-Fits-All Climate Policy*, BROOKINGS INST. (June 1, 2023), https://www.brookings.edu/articles/the-us-cant-achieve-environmental-justice-through-one-size-fits-all-climate-policy [https://perma.cc/SRJ3-G5SE].

98 JUSTIN BADLAM, JARED COX, ADI KUMAR, NEHAL MEHTA, SARA O'ROURKE & JULIA SILVIS, MCKINSEY & CO., THE INFLATION REDUCTION ACT: HERE'S WHAT'S IN IT 5 (2022), https://www.mckinsey.com/~/media/mckinsey/industries/public%20and%20social%20sector/our%20insights/the%20inflation%20reduction%20act%20heres%20whats%20in%20it/the-inflation-reduction-act-heres-whats-in-it_final.pdf [https://perma.cc/9ZZC-YMMD].

the rate now projected by Goldman Sachs, then as much as one trillion dollars will go towards corporate tax incentives—making this derisking portion of the Act's green industrial policy framework upwards of eighty percent of total spending.[99]

The margin for passing the IRA was famously narrow. It required over a year of fitful negotiations and barely secured a 50-50 tie in the Senate, with Vice President Kamala Harris serving as the tiebreaking fifty-first vote.[100] And it could only pass on this narrow margin by conforming to the rules of reconciliation and thus avoiding invocation of the filibuster—a constraint that limited its policy options to those involving budgetary design rather than regulation as such.[101] Political factors, then, most decidedly determined the Act's strategic emphasis on derisking, whether for better or for worse. The Biden Administration celebrates its green industrial policy as a welcome change from "the traditional model . . . of after-the-fact policy patches and vague promises of redistribution,"[102] but scholar Brett Christophers makes a forceful case that "[t]he I.R.A. will help accelerate the growing private ownership of U.S. infrastructure and, in particular, its concentration among a handful of global asset managers . . . ."[103]

We return to this conversation in Part IV, but believe it is missing some critical contours that we first hope to fill in. In brief, we assert, the challenge is this: fiscal derisking is likely to be less successful, standing alone, than either its proponents or detractors project. Fiscal derisking is an anemic, hands-off approach to infrastructure development that is unlikely to spur the pace or scope of clean energy infrastructure buildout necessary to reach U.S. climate pledges or scientifically necessary levels of decarbonization.[104] All will now turn on the web of *additional* government supports that fiscal derisking either impels or fails to impel based on politics, economics, and circumstance.

We build to this conclusion through an analysis of the attempted buildout of nuclear power in the United States over the last twenty-five years. As we

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99 We calculated these numbers based on an estimated $1.2 trillion total IRA spending from Saul, *supra* note 9.

100 Tony Romm, *Senate Approves Inflation Reduction Act, Clinching Long-Delayed Health and Climate Bill*, WASH. POST (Aug. 7, 2022, 5:16 PM), https://www.washingtonpost.com/us-policy/2022/08/07/senate-inflation-reduction-act-climate [https://perma.cc/UT4M-8Q6W].

101 *See* RICHARD KOGAN & DAVID REICH, CTR. ON BUDGET & POL'Y PRIORITIES, INTRODUCTION TO BUDGET "RECONCILIATION" (2022), https://www.cbpp.org/research/introduction-to-budget-reconciliation [https://perma.cc/VQH7-ELPL].

102 Jake Sullivan, Nat'l Sec. Advisor, Remarks on Renewing American Economic Leadership at the Brookings Institution (Apr. 27, 2023), https://www.whitehouse.gov/briefing-room/speeches-remarks/2023/04/27/remarks-by-national-security-advisor-jake-sullivan-on-renewing-american-economic-leadership-at-the-brookings-institution [https://perma.cc/E3ME-XK2Y].

103 Christophers, *supra* note 10.

104 *See infra* Part IV.

show, the story of how federal fiscal derisking initiatives unfolded in this space provides much fodder for considering the challenges of embracing this approach to drive a broader clean energy transition.

II. FEDERAL DERISKING TOWARD A NUCLEAR RENAISSANCE

Before delving into the recent U.S. nuclear experience, some legal and historical context helps set the stage. In this Part, we introduce the actors, institutions, and laws governing nuclear power; provide a brief history of twentieth-century efforts to promote nuclear reactor construction; and outline the federal incentives that launched post-2000 dreams of a nuclear renaissance.

A. *Key Institutions, Actors, and Laws Governing Nuclear Power*

The U.S. electricity industry has long been organized chiefly on a public utility model, in which investor-owned utilities (IOUs) provide electricity generation, transmission, and distribution within state-sanctioned monopoly service territories.[105] These IOUs are the predominant developers of nuclear power.[106] As privately owned companies, they turn to the financial markets to raise the revenue necessary to build a new plant, both through borrowing and through issuing additional securities.[107] That means that major Wall Street firms play a decisive role in whether a nuclear plant can obtain necessary financing.

At the same time, Wall Street's willingness to fund these IOUs hinges on expectations around whether the utility will earn enough money from its nuclear power sales to guarantee a healthy return on investment.[108] Here, regulatory regimes governing these IOUs prove determinative. Regulatory

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105 *See* HIRSH, *supra* note 12, at 11. Today, IOUs deliver power to seventy-two percent of Americans; the rest are served by cooperatives and municipal utilities. Lindstrom & Hoff, *supra* note 51.

106 *See U.S. Nuclear Plant Owners and Operators*, NUCLEAR ENERGY INST., https://www.nei.org/resources/statistics/us-nuclear-plant-owners-and-operators [https://perma.cc/AQ7N-FRKC] (last visited Dec. 2, 2024) (listing owners and operators of U.S. nuclear plants, almost all of which are IOUs).

107 *See* B.J. Csik, IAEA-SM-353/9, *The Challenge of Financing Nuclear Power Plants, in* INT'L ATOMIC ENERGY AGENCY, THE INTERNATIONAL SYMPOSIUM ON EVOLUTIONARY WATER COOLED REACTORS: STRATEGIC ISSUES, TECHNOLOGIES AND ECONOMIC VIABILITY 75, 79-80 (1999) (listing domestic and foreign sources of financing, including numerous types of borrowing); Nadira Barkatulla & Ali Ahmad, *Current Status and Emerging Trends in Financing Nuclear Power Projects*, 18 ENERGY STRATEGY REVS. 127, 136 (2017) (citing vendor financing as a key precursor to nuclear development). *See generally* LEONARDO R. GIACCHINO & JONATHAN A. LESSER, PRINCIPLES OF UTILITY CORPORATE FINANCE (2011).

108 *See* DAVID E. MCNABB, PUBLIC UTILITIES 176-77 (2d ed. 2016) (explaining the objectives of public utility managers and the financial decision-making behind these utilities).

commissions at both the state and federal level oversee the rates and practices of these IOUs to ensure they are "just and reasonable." Per the terms of the long-enduring 1935 Federal Power Act, the Federal Energy Regulatory Commission (FERC) has authority over the rates and practices affecting interstate transmission and wholesale electricity sales, while state utility commissions oversee electricity generation, distribution (smaller poles and wires), and retail rates.[109]

Because states retain authority over generation, state laws and state commission practices often dictate whether new nuclear power can be built. Traditionally (but no longer in many places, as we discuss momentarily), utilities recovered the cost of all system investments through rate regulation.[110] Under rate regulation, utilities recover the costs of building new infrastructure—plus a healthy rate of return (historically around ten percent)—through the prices charged to state ratepayers.[111] To safeguard consumers, most states require that utilities must prove that any new investments are "prudent" before obtaining rate recovery.[112] Many states also mandate that a utility cannot begin recovering the costs of new infrastructure until the plant is "used and useful"—that is, actually online and producing electricity.[113]

This description of the law governing the approval of new generation still applies to approximately one-third of the country, as measured by population—including the Southeast and the far West outside of California.[114] In other states, and at the federal level, the latter years of the twentieth century brought about a shift in regulatory philosophy and practice in electricity governance. Following deregulatory turns in other industries, Congress and FERC in the 1990s took steps to reform electricity by requiring utilities to provide "open access" to their transmission systems.[115] FERC also

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109 *See* 16 U.S.C. §§ 824–824w; *see also* Matthew R. Christiansen & Joshua C. Macey, *Long Live the Federal Power Act's Bright Line*, 134 HARV. L. REV. 1360, 1364-69 (2021) (arguing that, even with the rapid development of technology in the energy sector, the Federal Power Act's "bright line" between federal and state energy jurisdiction remains).

110 *See* HIRSH, *supra* note 12, at 27-28.

111 *Id.*; *see also* Karl Dunkle Werner & Stephen Jarvis, *Rate of Return Regulation Revisited* 9-12 (Energy Inst. Working Paper No. 329R, 2024) (showing returns around ten percent and noting regulatory reluctance to dip below ten percent).

112 *See* JIM LAZAR, REGUL. ASSISTANCE PROJECT, ELECTRICITY REGULATION IN THE US: A GUIDE 91 (2d ed. 2016).

113 *Id.*; *see also* Duquesne Light Co. v. Barasch, 488 U.S. 299, 301-02 (1989) (approving of a "used and useful" standard).

114 *Cf.* ISO/RTO COUNCIL, https://isorto.org [https://perma.cc/WY6U-QLSZ] (last visited Dec. 2, 2024) (noting that two-thirds of North America is instead governed by independent system operators (ISOs) and regional transmission organizations (RTOs)).

115 *See generally* Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public

asked utilities to join "regional transmission organizations" which collectively manage the regional grid and run markets in which electricity is bought and sold.[116] Utilities and independent power producers in these regions now compete to sell electricity in these markets, rather than being assured that all infrastructure built will be utilized and compensated at a guaranteed rate of return.[117] As we shall see, these reforms played a determinative role in the twenty-first-century fate of nuclear power.

So far, we have described the general legal regime for electricity into which nuclear power entered. But as a legal and policy matter, nuclear has never been treated as just some other electricity source because of its catastrophic risk potential, its ties to nuclear warfare, and the long-term waste challenges posed by spent nuclear fuel, which remains radioactive for thousands of years.[118] These extra challenges impelled Congress to create additional institutions and legal regimes specific to nuclear. In 1954, Congress charged the Atomic Energy Commission with both facilitating the civilian nuclear power industry and ensuring its safety.[119] After criticism mounted of the potential conflicts embedded in this dual mission, Congress in 1974 split these responsibilities and awarded the Nuclear Regulatory Commission (NRC) responsibility for the safety aspects of nuclear power.[120] Since this time, the NRC has been charged with certifying the safety of reactor designs; issuing construction and operation licenses to nuclear plant operators; and monitoring the safety and security practices of nuclear-operating utilities.[121]

Utilities and Transmitting Utilities, 61 Fed. Reg. 21540 (May 10, 1996) (codified as amended at 18 C.F.R. pts. 35, 385); Energy Policy Act of 1992, Pub. L. No. 102-486, 106 Stat. 2776 (codified as amended in various sections of 42 U.S.C. and others) (directing FERC to implement open access regulations).

116 *See* Regional Transmission Organizations, 65 Fed. Reg. 810 (Jan. 6, 2000) (codified as amended at 18 C.F.R. pt. 35). We are glossing over the details of regional transmission organizations and these markets for purposes of this Article. For more, see generally Shelley Welton, *Rethinking Grid Governance for the Climate Change Era*, 109 CALIF. L. REV. 209 (2021); Boyd, *supra* note 12; Daniel E. Walters & Andrew N. Kleit, *Grid Governance in the Energy-Trilemma Era: Remedying the Democracy Deficit*, 74 ALA. L. REV. 1033 (2023).

117 Spence, *supra* note 13, at 795-96.

118 *See* STEPHANIE COOKE, IN MORTAL HANDS: A CAUTIONARY HISTORY OF THE NUCLEAR AGE 13 (2009) (explaining that nuclear energy "harbored unprecedented peril" and "risked harmful, widespread exposure to radioactivity"); Huber, *supra* note 40, at 1171-72 (connecting the challenges of nuclear fuel disposal in the United States to a complex legal and political environment).

119 Atomic Energy Act of 1954, Pub. L. No. 83-703, 68 Stat. 919 (current version at 42 U.S.C. §§ 2011–2297h-13).

120 Energy Reorganization Act of 1974, Pub. L. 93-438, 88 Stat. 1233 (codified as amended 42 U.S.C. §§ 5801–5891); *see also* Richard Goldsmith, *Regulatory Reform and the Revival of Nuclear Power*, 20 HOFSTRA L. REV. 159, 170-71 (1991).

121 *See* 42 U.S.C. §§ 2131, 2232 (vesting responsibility in the NRC to license nuclear power plants and ensure "adequate protection" of the public); Emily Hammond & David B. Spence, *The*

The NRC is also a key player in ongoing debates over where and how to safely store nuclear waste, including through oversight of a program under which utilities help fund a long-term storage solution.[122]

As one might imagine, this mixed jurisdiction has created some friction between states' legal authority to approve and oversee new electricity generation, on the one hand, and the NRC's role in licensing new nuclear plants, on the other.[123] These tensions came to a head in the 1983 case *Pacific Gas & Electric v. State Energy Research Conservation & Development Commission*, which scrutinized a California law that conditioned state regulatory approval upon a finding that adequate means of storage and disposal were available for nuclear waste.[124] In upholding the California law, the Supreme Court entrenched the divide between federal regulation of the "radiological safety aspects involved in the construction and operation of a nuclear plant" and "traditional [state] responsibility . . . for determining questions of need, reliability, [and] cost."[125] The Court allowed the law to stand because it served an "economic purpose" and therefore lay beyond the reach of federal safety regulation.[126] Consequently, to the extent that the question of whether to build new nuclear turns on considerations of costs and who should bear them—and it frequently does—state law remains core to the inquiry.

B. *A Brief History of Twentieth-Century Nuclear Derisking*

Promoting nuclear power became a federal policy priority following World War II, as the slogan "Atoms for Peace"[127] propelled visions of a beneficent use of nuclear fission technology that would make electricity "too cheap to meter."[128] But the nature of nuclear power makes it a complex technology to finance, construct, operate, and govern. It is capital-intensive, requiring considerably more up-front expenditures than either coal or natural

Regulatory Contract in the Marketplace, 69 VAND. L. REV. 141, 175-76 (2016) (describing the intensive licensing process that the NRC oversees).

122 *See* Huber, *supra* note 40, at 1186-88, 1204-07 (tracing the tortured history of regulation addressing long-term nuclear storage waste).

123 *See, e.g.*, Pac. Gas & Elec. Co. v. State Energy Res. Conservation & Dev. Comm'n, 461 U.S. 190, 194 (1983) ("The interrelationship of federal and state authority in the nuclear energy field has not been simple . . . .").

124 *Id.*

125 *Id.* at 205.

126 *Id.* at 216.

127 *Atoms for Peace*, DWIGHT D. EISENHOWER PRESIDENTIAL LIBR. & MUSEUM, https://www.eisenhowerlibrary.gov/research/online-documents/atoms-peace [https://perma.cc/43B7-L7D2] (last visited Dec. 2, 2024).

128 Goldsmith, *supra* note 120, at 161; *see also* Pac. Gas & Elec. Co., 461 U.S. at 190-91 ("The turning of swords into plowshares has symbolized the transformation of atomic power into a source of energy in American society.").

gas plants.[129] Relatedly, it has economies of scale, which makes larger plants easier to justify from a cost standpoint—even as this makes each individual project bigger and thus financially and physically riskier.[130] And its operation carries low-probability but high-consequence risks that evoke dread in the public, causing its safety to be tightly regulated.[131]

For these reasons, it was never enough to simply develop the relevant technology and then wish nuclear power generation into existence. Even in the 1950s—before environmentalists raised and litigated the specter of nuclear accidents—utilities and their financiers proved unwilling to bet on developing new nuclear power.[132] They worried chiefly about the risk of liability in the case of a nuclear disaster, which could easily bankrupt the relevant parties.[133] To respond to these concerns, Congress passed the Price-Anderson Act in 1957, which created a public/private insurance system for nuclear reactors.[134] This complex scheme consists of a joint insurance pool for nuclear owners and a cap on the total amount of industry liability in the event of a disaster, with the remaining costs to be picked up by the U.S. government.[135]

Price-Anderson's regulatory derisking structure proved the spur necessary for utilities to begin nuclear power plant construction in earnest, particularly as electricity demand accelerated through the 1950s and 1960s.[136] At this time, because the electricity industry was still wholly vertically integrated, utilities could simply petition their state utility commission for permission to build a

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129 Paul L. Joskow & John E. Parsons, *The Economic Future of Nuclear Power*, 138 DAEDALUS J. AM. ACAD. ARTS & SCIS. 45, 46-47 (2009); *see also* Sony Ben-Moshe, Jason J. Crowell, Kelley M. Gale, Breton A. Peace, Brett P. Rosenblatt & Kelly D. Thomason, *Financing the Nuclear Renaissance: The Benefits and Potential Pitfalls of Federal & State Government Subsidies and the Future of Nuclear Power in California*, 30 ENERGY L.J. 497, 506 (2009) (citing studies that show nuclear power "cannot be economically competitive with . . . coal or natural gas" due to high capital costs and cost recovery).

130 *See* M.D. Carelli, P. Garrone, G. Locatelli, M. Mancini, C. Mycoff, P. Trucco & M.E. Ricotti, *Economic Features of Integral, Modular, Small-to-Medium Size Reactors*, 52 PROGRESS NUCLEAR ENERGY 403, 404 (2010) ("Economies of scale are widely held to drive the generation cost structure of nuclear power plants.").

131 Emily Hammond and David Spence have developed an intriguing account of what they term nuclear's "risk premium," explaining that nuclear power is much more expensive because "nuclear regulation requires owners of nuclear power plants to internalize more of their externalities than other sources of generation." Hammond & Spence, *supra* note 121, at 174, 177.

132 *See* Goldsmith, *supra* note 120, at 163 n.11 ("Passage of the Atomic Energy Act of 1954 did not immediately elicit the private investment in nuclear power that Congress had sought to encourage.").

133 *Id.*

134 *See* Price-Anderson Act, Pub. L. No. 85-256, § 170, 71 Stat. 576, 576-77 (1957) (codified at 42 U.S.C. § 2210).

135 *See* Harold P. Green, *Nuclear Power: Risk, Liability and Indemnity*, 71 MICH. L. REV. 479, 502-05 (1973).

136 *See* HIRSH, *supra* note 12, at 50-51 (charting the "ideology of growth" prevailing in this period).

new nuclear plant. Any prudent expenses thereafter incurred were presumptively passed on to ratepayers, along with a generous rate of return.[137]

Petition they did. The first U.S. nuclear reactor was completed in Pennsylvania in 1957.[138] During the 1960s, orders for new reactors surged, to a high of forty in 1973.[139] As these statistics suggest, rate-regulated utilities generally *like* the prospect of building nuclear power, as long as they perceive its risks as low. Nuclear's capital-intensive nature means that it provides healthy amplification to a utility's rate base, upon which the company earns a rate of return.[140] Nuclear also runs steadily over time, producing what is called "baseload power"—predictable and easy to manage.[141] And nuclear reactors provide a significant number of well-paid jobs, creating an industry selling point for host communities, labor unions, and commissions.[142]

However, nuclear's complexity also renders it prone to delays and cost overruns during construction.[143] Throughout the 1950s and 60s, utilities presumed that the risks of such delays and cost overruns would be borne by consumers, since state commissions had given their respective utilities the go-ahead to build. They also expected that the federal government would provide a long-term solution for nuclear waste storage. Time would prove these assumptions wrong.

The fate of nuclear power began to shift in the 1970s. Various historical accounts emphasize different catalysts. First, the 1970s ushered in a series of new environmental laws and environmental activists, who found an early target in nuclear power plants and what they perceived as a rubber-stamp administrative process for their approval at the NRC.[144] Using the tools provided by new federal environmental statutes, environmental activists famously sued to stop many nuclear power plants and ensure more robust

137 *See supra* notes 110–113 and accompanying text.

138 J. Matthew Roney, *U.S. Nuclear Power in Decline*, GRIST (Sept. 10, 2013), https://grist.org/article/u-s-nuclear-power-in-decline [https://perma.cc/VHM3-QNDX].

139 *Id.*

140 *See supra* notes 110–113 and accompanying text.

141 *See* Off. of Nuclear Energy, *Nuclear Power is the Most Reliable Energy Source and It's Not Even Close*, U.S. DEP'T OF ENERGY (Mar. 24, 2021), https://www.energy.gov/ne/articles/nuclear-power-most-reliable-energy-source-and-its-not-even-close [https://perma.cc/5N2E-PT2Q].

142 *See Jobs*, NUCLEAR ENERGY INST., https://www.nei.org/advantages/jobs [https://perma.cc/U39F-97YP] (last visited Nov. 26, 2024).

143 *See* Benjamin K. Sovacool, Alex Gilbert & Daniel Nugent, *Risk, Innovation, Electricity Infrastructure and Construction Cost Overruns: Testing Six Hypotheses*, 74 ENERGY 906, 907 (2014) (finding that "nuclear reactors are the riskiest technology in terms of mean cost escalation and frequency" across nearly a century of international infrastructure data).

144 *See* Hammond & Spence, *supra* note 121, at 182-83 (describing public opposition to the existing procedural requirements for nuclear regulation).

public participation in nuclear safety permitting regimes.[145] Many in the nuclear industry and beyond suggest that the delays created by these environmental opponents were a major factor in the industry's forthcoming financial woes.[146]

But environmentalists alone were not to blame. Prior to 1970, energy demand consistently increased and coal and nuclear typically appeared more cost-effective than oil or gas—a pattern reinforced by the infamous energy crisis of 1973.[147] However, the 1970s were a decade of turmoil and change for the utility industry, as demand stagnated and natural gas and oil prices first spiked, then dropped.[148] Nuclear construction also suffered from, in the words of Hammond and Spence, "regulatory delays, redesign requirements, and poor construction management and quality control."[149] By the end of the decade, nuclear plants that were running years behind schedule and over cost did not look like such strong investments.[150] These dynamics were exacerbated by the United States' worst domestic nuclear disaster, which occurred at the Pennsylvania nuclear facility Three Mile Island in 1979.[151] That disaster was frightening but easily contained; seven years later, however, the Chernobyl nuclear disaster in Ukraine showed the world how devastating a major nuclear accident could be.[152]

Altogether, these events caused state regulators to reconsider nuclear investments, both planned and those already underway. As J. Matthew Roney reports, "[o]f the 253 reactors that were ordered by 1978, 121 were canceled either before or during construction."[153] Many utilities absorbed significant losses as a result of cancelled plants because regulators proved unwilling to

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145 *See, e.g.*, Vt. Yankee Nuclear Power Corp. v. Nat. Res. Def. Council, Inc. 435 U.S. 519, 527-28 (1978) (describing respondent's objection to the granting of an operating license to a nuclear power plant); Hammond & Spence, *supra* note 121, at 182-83.

146 *See* Hammond & Spence, *supra* note 121, at 182-83 (noting that opponents of nuclear aimed to create more formalized procedures, "which generally take more time than less formal approaches"); N.L. Char & B.J. Csik, *Nuclear Power Development: History and Outlook*, 29 IAEA BULL. 19, 20 (1987) (describing how negative public attitudes towards nuclear led to "slowed-down programme[s]").

147 *See* Hammond & Spence, *supra* note 121, at 184 ("Nuclear power plants in operation today were constructed on the assumption that electricity demand would skyrocket, during a period when natural gas-fueled electricity generation was banned due to shortages, oil prices were escalating . . . ." (footnotes omitted)) ; Char & Csik, *supra* note 146, at 19 ("[T]he oil price shocks of the 1970s . . . gave a big boost to the promotion and further development of nuclear power.").

148 *See* HIRSH, *supra* note 12, at 60-70.

149 Hammond & Spence, *supra* note 121, at 185.

150 *See id.*

151 *See generally* J. Samuel Walker, THREE MILE ISLAND: A NUCLEAR CRISIS IN HISTORICAL PERSPECTIVE (2004).

152 *See generally* V. Saenko, V. Ivanov, A. Tsyb, T. Bogdanova, M. Tronko, Yu. Demidchick & S. Yamashita, *The Chernobyl Accident and Its Consequences,* 23 CLINICAL ONCOLOGY 234 (2011).

153 Roney, *supra* note 138.

cast the entire burden of failed undertakings on ratepayers.[154] Under the core legal standard, disallowing recovery of such costs is illegal only if the "end result" is that the utility ends up financially jeopardized.[155] Applying this standard in *Duquesne Light Co. v. Barasch*, the Supreme Court in 1989 upheld the Pennsylvania Supreme Court's decision to disallow recovery for thirty-five million dollars of sunk nuclear costs under a brand new state law that only allowed utilities to recover ratepayer funding for "used and useful" investments.[156] Because the results of the decision did not "imped[e] their ability to raise future capital," the utilities had no recourse.[157] As Hammond and Spence explain, this precedent and resulting opinions reverberated across the industry, "undermin[ing] investors' expectation that the costs involved in obtaining a nuclear operating license would largely be borne by ratepayers."[158] As the next Part makes apparent, these decisions cast a long shadow over contemporary nuclear development.

After 1978, there were no new domestic orders for nuclear power plants for decades.[159] The NRC attempted to spur development in the 1990s by streamlining its licensing process to reduce delays and risk, to no avail. The reforms proved both necessary and insufficient for utilities to bet again on nuclear power.[160] It would take a bolder set of changes—and considerably more muscular derisking—to launch renewed utility interest in nuclear power.

C. *The National Mood on Nuclear Turns*

Around the year 2000, the national mood on nuclear power turned. A confluence of factors contributed to this change: rising natural gas prices, concerns about climate change and coal-related air pollution, and a long

154 *See* Duquesne Light Co. v. Barasch, 488 U.S. 299, 301-02 (1989) (upholding state law requiring fixed rates without consideration of a utility's expenditures for electrical generating facilities that were "planned but never built"); Richard J. Pierce, Jr., *The Regulatory Treatment of Mistakes in Retrospect: Canceled Plants and Excess Capacity*, 132 U. PA. L. REV. 497, 524 (1984) (describing the regulatory schemes that have "the effect of allocating the costs of the investment . . . in a way that places from fifty to one hundred percent of the burden on the utility").

155 *See* Fed. Power Comm'n v. Hope Nat. Gas, 320 U.S. 591, 605 (1944) (holding that mandating rates that allow the utility to "maintain its financial integrity" are valid).

156 488 U.S. at 301-02; *see* Hammond & Spence, *supra* note 121, at 186.

157 *Duquesne Light Co.*, 488 U.S. at 312.

158 Hammond & Spence, *supra* note 121, at 186.

159 Goldsmith, *supra* note 120, at 159.

160 Goldsmith, *supra* note 120, at 182-83; Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Reactors, 54 Fed. Reg. 15372, 15373 (1989) ("[T]he Commission has . . . the simple aim in this rulemaking of providing procedures for the standardization of nuclear power plants and . . . resolution of safety and environmental issues in licensing proceedings.").

period of accident-free nuclear generation across the United States.[161] Whereas a new reactor was deemed "unthinkable" even a year earlier, utilities were seriously considering new nuclear as of 2001.[162] But given the checkered history of the first nuclear boom, utilities were not willing to re-enter nuclear construction without additional, substantial governmental derisking initiatives. Consequently, a consortium of utilities and their trade groups undertook a concentrated Congressional lobbying effort.[163] President George W. Bush joined these industry representatives in pushing for the major energy bill under deliberation in the 2004–05 congressional session to include incentives for new nuclear power.[164]

Congress delivered in the Energy Policy Act of 2005. The bill contained several noteworthy incentives for new nuclear power, including:

> (1) *Production tax credits*, which provided up to $1.5 billion over eight years, geared to total production. The credits, modeled on 1992 federal credits for wind power,[165] were available for up to 6000 megawatts of nuclear generation.[166]
>
> (2) *Risk insurance*, to mitigate the costs of legal challenges and regulatory delays while a reactor was under construction. The first two utilities to have new nuclear projects approved would qualify for $500 million in insurance; the next four $250 million.[167]
>
> (3) *Loan guarantees*, which—for selected reactors—obligated the federal government to cover up to eighty percent of the cost of a nuclear reactor if a utility defaulted on its loan.[168]

These measures were explicitly designed to shield investors and institutional lenders from risk and thereby help lower the interest rates that utilities would pay on loans to finance new nuclear construction.[169]

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161 H. Josef Hebert, *Climate, Energy Woes Spark Nuclear Revival*, HERALD-SUN, Apr. 26, 2001, at A1.

162 *Id.* at A1 (quoting then-NRC chairman Richard Meserve).

163 Diane Farsetta, *Meet the Nuclear Power Lobby*, PROGRESSIVE MAG. (Mar. 15, 2008, 2:45 PM), https://progressive.org/latest/meet-nuclear-power-lobby [https://perma.cc/6EH4-DU83].

164 Nedra Pickler, *Bush Wants Nuclear Plants—He Says More Are Needed in U.S. to Ease Reliance on Fossil Fuels*, CHARLOTTE OBSERVER, June 23, 2005, at 12A.

165 *See* Ben-Moshe et al., *supra* note 129, at 514 ("Congress intended to draw on the positive experience it has had with subsidizing renewable energy projects through tax credits in order to promote new nuclear development under the EPAct 2005.").

166 Energy Policy Act of 2005, Pub. L. No. 109-58, § 1306, 119 Stat. 594, 998.

167 *Id.* at § 638, 119 Stat. at 791.

168 *Id.* at §§ 1702–03, 119 Stat. at 1117-20. Congress delegated responsibility for developing the details of these loan guarantees and administering them to the Department of Energy. *Id.*

169 *Incentives for Nuclear Plants*, RALEIGH NEWS & OBSERVER, Sept. 8, 2005, at A16.

These new federal incentives soon sparked utility interest. However, the industry's structure had changed since the last nuclear boom. In areas of the country that had moved to electricity markets in which generators had to bid their electricity, new reactors remained a non-starter. Federal subsidies simply did not provide enough of a guarantee that nuclear-fired kilowatt-hours could ultimately be produced at rates competitive with other generation sources, which could be constructed far more quickly and with less up-front expense.[170] Without a legal structure that provided assured recovery of construction costs, investors had no appetite for new nuclear.[171] A senior vice president at utility Ameren explained that "[y]ou'd get laughed off Wall Street" without traditional, rate-based cost recovery.[172]

That left only areas of the country under traditional public utility regulation as candidates for new nuclear. Under this regime, if state regulators authorized new nuclear plants to be built, the plants would not have to compete in a marketplace to sell their output and would likely recover all or most construction costs through rates. Many traditionally regulated states, however, explicitly restricted new nuclear construction at this point.[173] Only the Southeast retained both traditional public utility regulation and an affinity for the technology. Even so, southern utilities remained wary—until they figured out how to catalyze the new federal incentives into additional legal supports at the state level.

III. THE SOUTHERN NUCLEAR DERISKING EXPERIMENT

In this Part, we describe the experience of four southern states whose utilities pursued nuclear power under the federal government's 2005 derisking legislation. Our study area—and the utility territories that it includes—is reproduced below in Figure 1. These are not the only four states to begin pursuing nuclear; the Department of Energy received seventeen

170 *See, e.g.*, *Credit Aspects of North American and European Nuclear Power*, CREDITWEEK, Jan. 18, 2006, at 28 (suggesting that although federal legislation created "some sort of supportive platform for a nuclear renaissance in the U.S.," it "may not be substantial enough to sustain credit quality"); Hammond & Spence, *supra* note 121, at 189-90 (explaining why nuclear power is priced out of electricity markets).

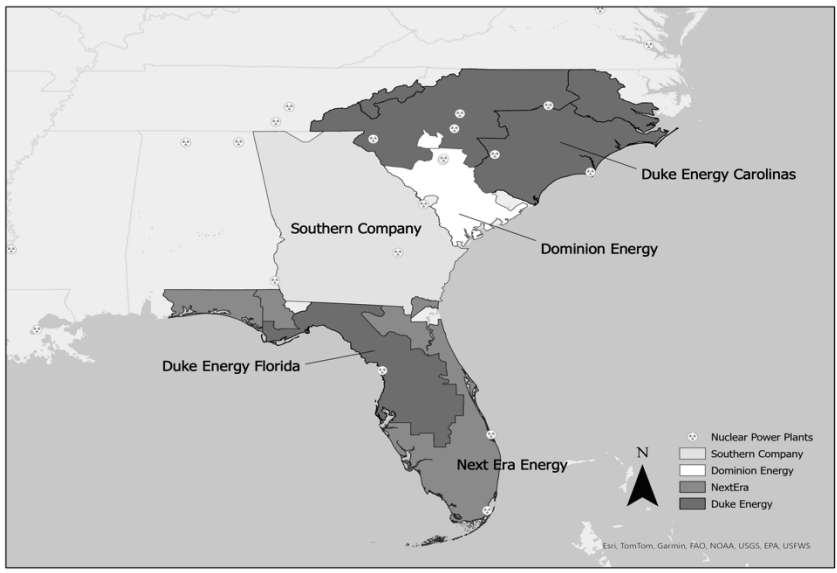
171 *Id.* at 190-91.

172 Ben-Moshe et al., *supra* note 129, at 504 (internal quotation marks omitted).

173 *Cf. State Restrictions on New Nuclear Power Facility Construction*, NAT'L CONF. ON STATE LEGISLATURES, https://www.ncsl.org/environment-and-natural-resources/states-restrictions-on-new-nuclear-power-facility-construction [https://perma.cc/DTC5-ZPDR] (updated Sept. 28, 2023) (noting that twelve states currently have some restrictions on the construction of new nuclear facilities). Since 2016, six state legislatures have lifted freezes on new nuclear, leaving only ten states with bans still in place. Martucci, *supra* note 25.

early applications for its loan guarantee program.[174] However, our sample includes the two states that went the furthest toward developing reactors (Georgia and South Carolina), and two complementary examples of states that halted nuclear infrastructure development somewhat earlier (Florida and North Carolina). These histories thus provide an ample window into efforts to move forward with nuclear energy under federal derisking initiatives.

Figure 1: Study Area and Utility Territories[175]



174 William Freebairn, *US DOE Will Offer $12.6 Billion in New Nuclear Loan Guarantees*, S&P GLOB.: COMMODITY INSIGHTS (Sept. 30, 2014, 4:13 AM), https://www.spglobal.com/commodityinsights/pt/market-insights/latest-news/electric-power/093014-us-doe-will-offer-126-billion-in-new-nuclear-loan-guarantees [https://perma.cc/D4XW-RKCP] (observing that of these seventeen applications, only the loan guarantees for Georgia's Vogtle Project were finalized).

175 *Electric Holding Company Areas*, GEOSPATIAL MGMT. OFF., https://hifld-geoplatform.hub.arcgis.com/datasets/42e8e0c7a3194ab0a42604e5a2cb63ef_0/explore?location=31.354929%2C-78.362746%2C6.00 [https://perma.cc/7LQ3-ABW9] (last visited Nov. 26, 2024). For sake of presentation, this map excludes cooperative territories within identified utility territories.

A. *Georgia: Where "Corporate Welfare" Got New Nuclear Built*[176]

The nuclear renaissance begins—and really ends—in Georgia. Georgia's electricity supply is dominated by Southern Company, an Atlanta-based holding company that includes subsidiaries Georgia Power, Alabama Power, and Mississippi Power.[177] In addition, municipal and rural electric cooperatives service some rural areas and purchase power from two large, cooperatively owned distributors: the Oglethorpe Power Corporation and the Municipal Electric Authority of Georgia.[178]

In 2006, Southern applied to the Georgia Public Service Commission (GA PSC) for permission to begin a fifty million dollar ratepayer-funded study on nuclear power options for the state.[179] Southern justified the study by pointing to the new federal derisking incentives.[180] The GA PSC approved Southern's study request in June 2006 and the utility shortly thereafter applied for an NRC early site permit to build two new nuclear reactors outside Augusta at Plant Vogtle, already the site of two long-standing reactors.[181] This application was the fourth in line at the NRC, after others from utilities in Virginia, Mississippi, and Illinois—all of which ultimately were not pursued.[182]

Southern, however, forged ahead. In 2008, it filed a plan with state regulators to add two 1,100-megawatt nuclear reactors, estimating that "the units would save customers between $2 billion and $6.5 billion in generation costs during their lifetime, when compared with similarly sized coal-powered units, and between $1 billion and $6.5 billion when compared with a natural-gas-fired plant."[183] To build these reactors, Southern entered into a contract

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176 Debbie Dooley & David Staples, *Stop Rewarding Failure: Protect Consumers, Not Profits*, AUGUSTA CHRON., Nov. 12, 2017, at E3 (labeling the Georgia handouts to Southern Company as "corporate welfare").

177 When discussing decisions made by Southern Company's Georgia Power, we simply refer to "Southern."

178 GA. PUB. SERV. COMM'N, STAFF REPORT ON ELECTRIC INDUSTRY RESTRUCTURING, DKT. NO. 7313-U, at 16-17 (1998), http://www.psc.state.ga.us/electricindust/Final%20Draft%2012398.pdf [https://perma.cc/7335-LFKG].

179 Vicky Eckenrode, *Reactor Study Is Moving Forward*, AUGUSTA CHRON., Mar. 17, 2006, at A03.

180 Vicky Eckenrode, *Nuclear Power Making an Energetic Resurgence*, AUGUSTA CHRON., May 7, 2006, at A12; *see* Req. for an Acct. Authorizing the Use of FERC Acct. 183 (Prelim. Survey and Investigation Charges) to Rec. Certain Early Site Permitting and Constr. Operating License Costs, Docket No. 22449-U (Ga. Pub. Serv. Comm'n Feb. 20, 2006).

181 Jeff Nesmith, *Nuclear Power in Georgia: Southern Competes for Federal Funding*, ATLANTA J.-CONST., Aug. 19, 2006, at B1.

182 *Id.*

183 Jake Armstrong, *Ga. Power Lays Out Case for Nuclear Expansion*, SAVANNAH MORNING NEWS, Aug. 2, 2008, at 2B.

with Westinghouse Electric Company and the Shaw Group for engineering, procurement, and construction.[184] This was the first contract for new U.S. nuclear reactors in thirty years, and its viability hinged largely on the reactor design selected: the Westinghouse AP1000.[185] The AP1000 employed existing pressurized water technology but was billed as incorporating a "simplified, innovative, and effective approach to safety," as well as a modular design that allowed for components of the plant to be pre-fabricated off-site, producing "considerable savings in capital investment, and lower operation and maintenance costs."[186] At this point, Westinghouse—owned by Toshiba Corporation—already had four AP1000s planned for China,[187] and the NRC had approved the initial design certification for the AP1000 in December 2005.[188] As we shall see, Georgia was not alone in opting for this plant design, with reverberating consequences in later years.

Southern proposed to develop the new Vogtle project in collaboration with three other utilities—Oglethorpe Power, Municipal Electric Authority of Georgia, and Dalton Utilities (supplier to the city of Dalton, GA)—all also owners of the then-running Vogtle reactors. Under the proposal, Southern would own 45.7% of the new units and pay a proportional amount of the expansion's total fourteen billion dollar cost.[189] Oglethorpe Power would own thirty percent, Municipal Electric Authority of Georgia 22.7%, and Dalton Utilities 1.6%.[190]

But Southern had no intention of building these reactors under then-existing public utility law. The utility and its investors needed more assurance

184 Eileen O'Grady, *Shaw, Westinghouse May Build Georgia Nuclear Units*, REUTERS (Apr. 8, 2008, 7:42 PM), https://www.reuters.com/article/utilities-nuclear-vogtle-idUKN0840629520080408 [https://perma.cc/XS4H-7WJ2].

185 *Id.*

186 *AP1000 Reactor Design Overview*, WESTINGHOUSE, https://www.westinghousenuclear.com/energy-systems/ap1000-pwr/overview [https://perma.cc/Y5GM-VLRQ] (last visited Jan. 17, 2024); *see* Tom Hals & Emily Flitter, *How Two Cutting Edge U.S. Nuclear Projects Bankrupted Westinghouse*, REUTERS (May 2, 2017, 5:48 AM), https://www.reuters.com/article/us-toshiba-accounting-westinghouse-nucle-idUSKBN17Y0CQ [https://perma.cc/22Q9-ZEKJ] ("[B]uilding pre-fabricated sections of the plants before sending them to the construction sites for assembly . . . was supposed to revolutionize the industry by making it cheaper and safer to build nuclear plants.").

187 *U.S. NRC Slams Westinghouse AP1000's Flawed Design*, 697 NUCLEAR MONITOR, Nov. 6, 2009, at 2, https://www.nirs.org/wp-content/uploads/mononline/nm697.pdf [https://perma.cc/9DA8-TQNH].

188 *Issued Design Certification—Advanced Passive 1000 (AP1000)*, U.S. NUCLEAR REGUL. COMM'N (Mar. 15, 2024), https://www.nrc.gov/reactors/new-reactors/large-lwr/design-cert/ap1000.html [https://perma.cc/HZ2Z-BQ8X].

189 Armstrong, *supra* note 183.

190 *Clean Energy for a Bright Future—Plant Vogtle Is the Largest Generator of Clean Energy in the United States*, S. CO., https://www.southerncompany.com/innovation/vogtle-3-and-4.html [https://perma.cc/8VZB-2S34] (last visited Nov. 26, 2024).

that they could not, *á la Duquesne*,[191] be left holding the bag if the reactors' construction did not go according to plan.[192] Southern thus approached the Georgia legislature to ask for an amendment to the state's public utility laws that would allow the company to recover the costs of the reactor during construction and provide additional assurances that ratepayers would bear risks of a project gone awry.[193] In 2009, Georgia's legislature approved "Construction Work in Progress" (CWIP) funding, which would allow the utility to recover the costs of financing the new plants from ratepayers during their construction.[194] The change was projected to raise customers' monthly bills by $1.30 per month in 2011, gradually increasing to $9 per month in 2017.[195] The legislature adopted the bill via a substantial majority, with supporters justifying it on the grounds that it would save money for consumers in the long run because they would avoid paying $300 million in interest over the life of the plant.[196] Notably, the language of the bill authorizing CWIP largely exempted the state's biggest industrial and commercial customers, thereby "defang[ing] the bill's most potent opposition at the Legislature."[197]

It is worth emphasizing that without this legislation, Southern very likely would not have proceeded. But with CWIP plus federal incentives, the utility and its investors felt confident that nuclear was a sufficiently derisked proposition and thus proceeded with their plans to build. In 2009, Southern won approval from the GA PSC to build the two new units under CWIP cost

191 *See supra* notes 156–157 and accompanying text.

192 *See* William Boyd & Ann E. Carlson, *Accidents of Federalism: Ratemaking and Policy Innovation in Public Utility Law*, 63 UCLA L. REV. 810, 849 (2016) (explaining utility hesitance to invest in nuclear absent additional protections).

193 Margaret Newkirk & Mary Lou Pickel, *Will Bill Give Big Biz Break*, ATLANTA J.-CONST, Jan. 17, 2009, at B1 (describing public support of the bill by Georgia Power, which argued that "early collection would hold down project costs").

194 With these changes in place, Georgia's law provided that: "Notwithstanding any provision to the contrary, a utility shall recover from its customers, as provided in this subsection, the costs of financing associated with the construction of a nuclear generating plant which has been certified by the commission." Georgia Nuclear Energy Financing Act, S. 31, 150th Gen. Assemb., Reg. Sess. (Ga. 2009). The Act was amended in 2018 to add the phrase "prior to January 1, 2018" to the end of the specified sentence. S. 355, 154th Gen. Assemb., Reg. Sess. (Ga. 2018).

195 JoAnn Merrigan, *Georgia Power Can Collect Up Front for Nuclear Plants, According to Bill Passed Today*, NBC-3 WSAV, Feb. 27, 2009, at 1.

196 *See SB 31: Georgia Nuclear Energy Financing Act; Procedure for Changing Any Rate, Charge, Classification, Service*, GA. GEN. ASSEMBLY, https://www.legis.ga.gov/legislation/26144 [https://perma.cc/P32E-C5P4] (last visited Nov. 22, 2024) (showing significant majority votes in favor of the bill's passage); *see also* Rick D'Arezzo, *Will Consumers Save in Nuclear Deal? Con: Customers Will Pay More, Bear Big Risk*, ATLANTA J.-CONST., Feb. 24, 2009, at A6 (critically reporting legislators' purported rationale); Margaret Newkirk, *Georgia Power Defends Nuclear Fee Plan*, ATLANTA J.-CONST., Jan. 28, 2009, at B1.

197 Newkirk & Pickel, *supra* note 193; *see also* Ga. S. 31.

recovery.[198] An accompanying stipulation set Southern's portion of the new nuclear units' costs as $6.446 billion and required appointment of an independent construction monitor to oversee the project.[199] The following year, Southern and its partners secured a provisional commitment of $8.3 billion in federal loan guarantees.[200] This amount would ultimately grow to $12 billion.[201]

Preparations for construction then began, but delays and cost overruns quickly piled up. It did not help that in 2011, the disaster at the Fukushima Plant in Japan caused a hard reexamination of nuclear power across the world.[202] Proponents of the AP1000 design insisted it remained safe and was engineered to withstand the kind of disaster that struck at Fukushima due to several passive safety features.[203] But in 2011, following proposed amendments to the AP1000's design, the NRC delayed approval of the reactors.[204] Southern acknowledged that these snags in reactor design certification would cause setbacks in Georgia but assured regulators that it could get the project back on track.[205]

In 2012, the Vogtle project finally secured the necessary NRC approvals (over the unusual dissent of its chairman, who cited Fukushima-related safety concerns), with its completion slated for 2016 or 2017.[206] Southern and its

198 *See* Amended Certification Ord., Docket No. 27800 (Ga. Pub. Serv. Comm'n Mar. 17, 2009).

199 *PSC Approves Construction of New Units at Plant Vogtle*, THE DAILY CITIZEN, Mar. 18, 2009, at 1.

200 David Markiewicz, *Nuclear Plant in Line for Benefits; Obama Plan a Boost to Vogtle Operation; Company Will Share $8.3 Billion in Government Loans*, ATLANTA J.-CONST., Feb. 21, 2010, at 1D; Press Release, Off. of Nuclear Energy, U.S. Dep't of Energy, Obama Administration Announces Loan Guarantees to Construct New Nuclear Power Reactors in Georgia, (Feb. 16, 2010), https://www.energy.gov/ne/articles/obama-administration-announces-loan-guarantees-construct-new-nuclear-power-reactors [https://perma.cc/TRU6-KUTN].

201 Jeff Amy, *Georgia Nuclear Rebirth Arrives 7 Years Late, $17B Over Cost*, INDEPENDENT (May 25, 2023, 5:10 AM), https://www.independent.co.uk/news/ap-georgia-united-states-ceo-work-b2345415.html [https://perma.cc/7J67-GYRA].

202 *See* Younghwan Kim, Minki Kim & Wonjoon Kim, *Effect of the Fukushima Nuclear Disaster on Global Public Acceptance of Nuclear Energy*, 61 ENERGY POL'Y 822, 827 (2013) (analyzing changes in public opinion in forty-two countries after the Fukushima accident and finding significantly lowered public acceptance of nuclear energy).

203 *See* Martin Kaste, *Nuclear Reactor Redesigns Aim to Allay Safety Fears*, NPR (Mar. 17, 2011, 4:00 AM), https://www.npr.org/2011/03/17/134615077/Newer-Nuclear-Reactor-Designs-Aim-To-Allay-Safety-Fears [https://perma.cc/6AL8-AY56] (noting passive safety features such as a water cooling system which can operate "with no one at the controls").

204 *Regulatory Agency Questions New Nuclear Reactor Design N.C. Wants to Use*, ROCKY MOUNT TELEGRAM, May 20, 2011, at 1.

205 Rob Pavey, *Executives Admit Vogtle Delays, Overruns Possible*, AUGUSTA CHRON. (July 2, 2011, 12:13 AM), https://www.augustachronicle.com/story/news/2011/07/02/executives-admit-vogtle-delays-overruns-possible/14535234007 [https://perma.cc/E3UA-VGL5].

206 Matthew Daly, *NRC Set to Approve Georgia Nuclear Reactors*, ASSOC. PRESS STATE WIRE: GA., Feb. 9, 2012, at 1. Environmental groups challenged this NRC decision in federal court but lost.

investment partners had already spent four billion dollars in preparatory work at the Vogtle site by this point and announced plans to immediately begin construction of the reactors.[207] However, incorrectly installed metal bars in the project's foundation and contractors' delays in meeting quality rules soon further set the project back.[208] Buzz Miller, Southern's executive vice president of nuclear development, pivoted to a new talking point, emphasizing the need for quality construction over speed: "Get it right. There will be noise on cost, noise on schedule. Get it right. Long after you and I are dead this thing is going to be cranking out power."[209]

As delays mounted in 2013, concerns about the project's viability grew more persistent. As one reporter summed it up in 2013: "If Georgia was starting from scratch, it could not financially justify the nuclear power plant now under construction."[210] That's because once again, natural gas's fate had changed considerably, with prices for the fuel tumbling as hydraulic fracturing technologies allowed the domestic U.S. gas drilling industry to flourish.[211] But even though the outlook for new nuclear looked dire, the question remained open as to whether it made sense to finish the Vogtle reactors. One expert testifying to the GA PSC in August 2013 estimated that if the company could meet its then-current construction schedule, the plant would still be about $2.5 billion cheaper than new natural gas.[212]

In subsequent years, the schedule slipped further, and costs continued to mount. At one point, construction reportedly "stalled for eight months as engineers waited for the right signatures and paperwork needed to ship a section of the plant from a factory hundreds of miles away."[213] In September 2013, the GA PSC allowed construction to continue but deferred deciding

See Blue Ridge Env't Def. League v. Nuclear Regul. Comm'n, 716 F.3d 183, 187, 193, 200 (D.C. Cir. 2013) (rejecting the argument that the NRC abused its discretion in approving the AP1000 design while noting the chairman's dissent).

207 Julie Johnsson & Brian Wingfield, *Regulator Approves Southern's Reactors as Chairman Dissents*, BLOOMBERG (Feb. 9, 2012, 7:24 PM), https://www.bloomberg.com/news/articles/2012-02-09/southern-prepares-to-usher-in-new-nuclear-era-as-nrc-weighs-plan [https://perma.cc/XM7L-CD83].

208 Ray Henry, *Pressure on as Southern Co. Builds Nuclear Plant*, ASSOC. PRESS STATE WIRE: GA., Dec. 14, 2012, at 1.

209 *Id.*

210 Ray Henry, *Regulator: New Nuke Plant Now Wouldn't Make Sense*, AUGUSTA CHRON. (Aug. 13, 2013, 10:34 PM), https://www.augustachronicle.com/story/news/2013/08/14/regulator-new-nuke-plant-now-wouldnt-make-sense/14444670007 [https://perma.cc/MJ2J-UW4W].

211 2013 calculations put the costs of new nuclear power sixty-two percent higher than new natural gas and twenty-five percent higher than wind energy. Russell Grantham & Greg Bluestein, *Vogtle Navigates Rip Tides: Plant Gets Federal Backing for Loan*, THE ATLANTA J.-CONST., Feb. 23, 2014, at D1.

212 Henry, *supra* note 210.

213 Hals & Flitter, *supra* note 186.

whether Southern could recover additional expenditures from ratepayers.[214] By 2016, the project was three billion dollars over budget and three years behind schedule.[215]

In January 2017, the GA PSC approved a settlement on the Vogtle project, dropping the company's rate of return on the project from 10.95% to ten percent.[216] Then another hammer dropped: Westinghouse Electric, the company contracted to build the nuclear plants, filed for bankruptcy in March 2017.[217] Reporting attributed the bankruptcy to "huge losses stemming from Westinghouse's troubled nuclear construction projects in the American South" and suggested the event "cast[] a shadow over the global nuclear industry."[218]

Fresh questions arose regarding the wisdom of continuing to build in these circumstances, but Southern requested GA PSC's permission to proceed. At this point, analysts suggested that Southern's project costs were around $10.5 billion.[219] PSC staff reports blamed Southern for at least some of the project delays, noting that Vogtle had "12,296 design changes since inception," in part due to "[un]constructible or otherwise deficient" designs and inadequate supervision.[220] The GA PSC ultimately allowed the project to continue, though it required the company to credit consumers $188 million ($75/household) on their bills in 2018.[221] Toshiba Corporation paid $3.7 billion to Vogtle owners for the right to walk away from their guaranteed contract to

214 Ray Henry, *Ga. Approves Deal on Nuclear Plant Costs*, YAHOO! NEWS (Sept. 3, 2013, 1:09 PM), https://yahoo.com/news/ga-approves-deal-nuclear-plant-170914412.html [https://perma.cc/VM9K-UL86].

215 Russell Grantham, *Nuclear Energy: PSC Launching Early Look at Vogtle Overruns*, ATLANTA J.-CONST., Feb. 4, 2016, at A11.

216 *See* Stipulation, Docket No. 29849, at ¶ 9 (Ga. Pub. Serv. Comm'n Dec. 13, 2016); Russell Grantham, *Plant Expansion: You Will Foot the Bill for Vogtle Plant Overruns*, THE ATLANTIC. J.-CONST., Dec. 21, 2016, at A1.

217 Anne Maxwell, *Plant Vogtle Contractor Files for Bankruptcy*, WJBF (Mar. 29, 2017, 7:59 PM), https://www.wjbf.com/news/plant-vogtle-contractor-files-for-bankruptcy [https://perma.cc/S2MW-EPG8].

218 Diane Cardwell & Jonathan Soble, *Westinghouse Files for Bankruptcy, in Blow to Nuclear Power*, N.Y. TIMES (Mar. 29, 2017), https://www.nytimes.com/2017/03/29/business/westinghouse-toshiba-nuclear-bankruptcy.html [https://perma.cc/98F5-BGHU].

219 Tom Corwin, *Subsidizing New Nuclear Power Such as Vogtle Reactors Nation's Interest, Says Expert*, AUGUSTA CHRON. (Sept. 2, 2017, 11:00 PM), https://www.augustachronicle.com/story/news/2017/09/03/subsidizing-new-nuclear-power-such-vogtle-reactors-nation-s-interest-says-expert/14251168007 [https://perma.cc/BNY9-ZK96].

220 Anastaciah Ondieki, *Decision on Nuke Plant Could Come Next Week*, ATLANTA J.-CONST., Dec. 12, 2017, at B1.

221 *Ga Power Customers to Get Credits*, SAVANNAH MORNING NEWS, Sept. 10, 2018, at 1A.

build the reactors,[222] and Bechtel Corporation took over construction on the condition that the project partners would pay its full actual costs.[223]

The debate over Plant Vogtle spilled out into mainstream political races in 2017. Southern financed many of these races, pouring "at least $50,000 into the coffers of political candidates" in Georgia between 2015 and 2017.[224] Nuclear Matters, a Washington, D.C. based pro-nuclear group with ties to Georgia, dumped one million dollars into a 2018 runoff seat for the elected GA PSC—an unusual amount of money for a typically quiet and technocratic race.[225] The race pitted long-serving commissioner Chuck Eaton, who had previously supported the Vogtle project, against Democrat Libby Miller, who "promised to take a more skeptical approach to the Southern subsidiary on Vogtle matters."[226] Nuclear Matters' preferred candidate, Eaton, eked out a fifty-two percent victory in the runoff.[227]

In 2018, another two billion dollars in costs overruns triggered a contractual clause that required a vote of all project partners on whether to proceed.[228] Several partners balked at continuing construction as announced costs ballooned to twenty-seven billion dollars (from an initial fourteen billion dollars).[229] Oglethorpe Power and MEAG insisted on new cost controls and contractual arrangements but did not pull out of the project.[230]

In 2021, the story was more of the same: delays and cost escalations, with a new promise to finish construction in 2022.[231] By 2022, total project costs had soared to over thirty billion dollars.[232] Early 2023 brought news of more

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222 Amy, *supra* note 201.

223 City of Jacksonville v. Mun. Elec. Auth. of Ga., 608 F. Supp. 3d 1262, 1269 (N.D. Ga. 2020).

224 Greg Bluestein, *Plant Vogtle Could Shake Up Governor's Race*, ATLANTA J.-CONST., Dec. 21, 2017, at A6.

225 James Salzer, *Public Service Commission; Group Pours $1M into PSC Runoff*, ATLANTA J.-CONST., Nov. 30, 2018, at B1.

226 Colby Bermel, *Incumbent Republican Wins Runoff for Ga. Utility Commission Seat*, S&P GLOB. MARKET INTEL. (Dec. 5, 2018), https://web.archive.org/web/20190203111408/https://www.spglobal.com/marketintelligence/en/news-insights/trending/CFho8ORZG1ZLdtcFPv6nww2.

227 *Id.*

228 Nate Monroe, *Despite Jacksonville Utility's Objections, Plant Vogtle Gets OK from Georgia Power Agency*, SAVANNAH MORNING NEWS (Sept. 25, 2018, 7:03 AM), https://www.savannahnow.com/story/business/2018/09/24/despite-jacksonville-utilitys-objections-plant-vogtle-gets-ok-from-georgia-power-agency/10053960007 [https://perma.cc/KQ2F-99WL].

229 *Id.*

230 Jeff Amy, *Georgia Nuclear Plant's Cost Now Forecast to Top $30 Billion*, ASSOCIATED PRESS NEWS (May 8, 2022, 5:52 PM), https://apnews.com/article/business-environment-united-states-georgia-atlanta-7555f8d73c46f0e5513c15d391409aa3 [https://perma.cc/Q6PX-XUJW].

231 Abraham Kenmore, *PSC Staff Expect More Reactor Delays*, AUGUSTA CHRON., June 9, 2021, at A1.

232 Jeff Amy, *Third Nuclear Reactor Reaches 100% Power Output at Georgia's Plant Vogtle*, WSB-TV (May 29, 2023, 1:44 PM), https://www.wsbtv.com/news/local/atlanta/third-nuclear-reactor-

delay and cost overruns as the project neared completion.[233] Finally, in May 2023, one of the new Vogtle reactors reached full power output. The second reactor came online in 2024. Total cost: thirty-five billion dollars, which will be borne by "almost every electric customer" in Georgia.[234] PSC staff estimates that if Southern is allowed to charge for all of its nuclear spending within the rate base, it could earn an extra $9.4 billion in profit over sixty years.[235] Discussions over how much of these costs the Commission will ultimately allow to enter the rate base remain ongoing and contentious.[236]

Proponents of the reactors celebrate the long-term gains to be had from this financial pain, in the form of clean, abundant power to drive further economic development in Georgia.[237] Southern insists that Vogtle is critical to meeting its zero-carbon generation by 2035 goals.[238] Yet "[c]alculations show Vogtle's electricity will never be cheaper than other sources Georgia Power could have chosen, even after the federal government reduced borrowing costs by guaranteeing repayment of $12 billion in loans."[239]

B. *South Carolina: "They've Lost More Money than We Have in the Whole State Budget"*[240]

South Carolina's experience with nuclear started similarly to Georgia's. At this time, South Carolina Electric & Gas (SCE&G), a subsidiary of the SCANA Corporation, provided most electricity service in South Carolina.[241]

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reaches-100-power-output-georgias-plant-vogtle/BUZKF6VRBNHEHPO347S2VVRKWQ [https://perma.cc/H5HQ-KU29]; Drew Kann, *New Vogtle Nuclear Reactor Now Online, Completing Expansion*, ATLANTA J.-CONST. (Apr. 29, 2024), https://www.ajc.com/news/breaking-new-vogtle-nuclear-reactor-now-online-completing-expansion/TX5IKFCXZ5EQ3AWY6SQRBOXQW4 [https://perma.cc/Q3QN-XLFT].

233 *See* Amy, *supra* note 232.

234 *Id.*

235 Amy, *supra* note 201.

236 Jeff Amy, *Georgia Nuclear Plant Again Delayed at Cost of $200M More*, ASSOCIATED PRESS NEWS (Feb. 16, 2023, 7:53 PM), https://apnews.com/article/georgia-power-co-southern-climate-and-environment-business-3b1d6c65353c6a65b1ccfddede753ab7 [https://perma.cc/JRJ7-33YW].

237 David Still, *Opinion: Local Utilities, Customers Will Benefit from Vogtle's Added Energy*, ATLANTA J.-CONST. (Jan. 25, 2023), https://www.ajc.com/opinion/opinion-local-utilities-customers-will-benefit-from-vogtles-added-energy/MDTHZLNCMND2XAFKSLNFV2BHEM [https://perma.cc/F2R6-CSDX].

238 Amy, *supra* note 201.

239 *Id.*

240 Andrew Brown, *South Carolina House Committee Questions SCANA Executives About Secretive 2016 Construction Audit*, POST & COURIER, Sept. 15, 2017, at 1 (quoting S.C. Rep. William Crosby, R-North Charleston).

241 *See* Avery G. Wilks, *SCE&G Changing Name After VC Summer Nuclear Fiasco, Takeover*, THE STATE (Apr. 29, 2019, 2:19 PM), https://www.thestate.com/news/politics-government/article229799614.html [https://perma.cc/9B3P-CNNT] (describing SCE&G's role in South Carolina's utilities sector). We refer to the decisionmaking entity throughout as SCANA. SCANA has since been acquired by Dominion Energy, as detailed below.

South Carolina also has numerous electricity cooperatives and an unusual supplier for these cooperatives called Santee Cooper.[242] Santee Cooper, a state-owned entity, supplies electricity to two million South Carolinians either directly or through a cooperative.[243] North-Carolina-headquartered Duke Energy also supplies a portion of the state's electricity.[244]

These entities shared Georgia utilities' mounting enthusiasm for nuclear power in the early 2000s. Again, though, they were not prepared to proceed without substantial additional derisking. Duke and SCANA championed a bill in the South Carolina legislature called the "Base Load Review Act" (BLRA), with its name calling attention to nuclear's ability to meet load needs at all hours (unlike, pointedly, renewable energy).[245] The BLRA easily passed both houses of the South Carolina legislature in 2007, although the Governor somewhat cryptically let it go into effect without his signature, in what would be called foreshadowing were this a novel and not, unfortunately, reality.[246]

The BLRA was a more muscular version of the derisking legislation that passed in Georgia. In addition to allowing recovery of construction financing costs, it stipulated that a base load review order shall constitute "a final and binding determination that a plant is used and useful for utility purposes, and that its capital costs are prudent utility costs and expenses and are properly included in rates so long as the plant is constructed or is being constructed within the parameters of [approved costs]."[247] If cost estimates changed, the Act provided that the Commission nevertheless could *not* revisit the initial prudency determination "in any subsequent proceeding" and further specified that "prudent" abandonment would still allow for recovery of all approved construction costs.[248]

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242 *S.C. Co-ops Map*, THE ELEC. COOPS. OF S.C., https://www.ecsc.org/ecsc-members-map [https://perma.cc/WL3H-FB5S] (last visited Dec. 2, 2024).

243 S.C. PUB. SERV. AUTH. (SANTEE COOPER), INTEGRATED RESOURCE PLAN 3 (2018), https://energy.sc.gov/sites/energy/files/Documents/IRPs/Santee%20Cooper_IRP_2018_FINAL.pdf [https://perma.cc/HD5A-RLTV].

244 *Id.* at 19.

245 *See* S.C. CODE ANN. §§ 58-33-210 to 58-33-298 (2007); Chris Carenvale, Climate Advoc. Dir., S. All. for Clean Energy, Address at the South Carolina Tea Party Coalition Convention (Jan. 22, 2018), https://www.cleanenergy.org/blog/talking-energy-reform-with-the-sc-tea-party [https://perma.cc/LGF4-UAV3].

246 Doug Pardue, *Nuclear Reactions: State Law Powers New Energy Plants Despite Cheap Natural Gas; Will Fracking Make U.S. Energy Independent?*, POST & COURIER, Jul. 6, 2013, at A1.

247 S.C. CODE ANN. § 58-33-275(A) (2007).

248 *Id.* § 58-33-275(B) ("Determinations under Section 58-33-275(A) may not be challenged or reopened in any subsequent proceeding"); *id.* § 58-33-280(K) (2007) ("Where a plant is abandoned . . . the capital costs and AFUDC related to the plant shall nonetheless be recoverable under this article [if the utility proves] by a preponderance of the evidence that the decision to abandon construction of the plant was prudent.").

Proponents of the BLRA justified it on grounds similar to those used in Georgia: it would save customers money over the long term, especially as clean nuclear power attracted new industry to the state.[249] SCANA also justified the investments as a means to transition from coal and a hedge against "the potential for costly federal control of greenhouse-gas emissions."[250] SCANA thus began planning to build two new nuclear reactors at the company's VC Summer site.[251] In 2008, SCANA officially filed a request for advanced cost recovery with the South Carolina Public Service Commission for its portion of what it estimated would be around a ten billion dollar investment in two new units at VC Summer, again using the Westinghouse AP1000 design.[252] The proposal indicated that the costs of the units would increase electricity rates thirty-seven percent by the time the plants were fully online in 2019.[253] Under the proposal, SCANA would own fifty-five percent and foot $5.4 billion of the costs of the new units, while Santee Cooper would own forty-five percent and foot $4.4 billion in costs.[254]

After hearings in late 2008,[255] South Carolina's Office of Regulatory Staff (ORS) provided its statutorily required recommendation to the Commission. ORS, established in 2004, was charged with representing the "public interest" in rate proceedings, defined by statute as "a balancing of . . . concerns of the using and consuming public," "economic development," and "preservation of the financial integrity of the state's public utilities."[256] ORS recommended proceeding with the VC Summer reactors and authorizing advanced cost recovery.[257] Friends of the Earth, one of the key intervenors in the case, accused ORS of being captured and "cav[ing] in to virtually everything sought" by the utility.[258]

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249 *See, e.g.*, Bill Herbkersman, *New Law Will Help Utilities Keep Up*, BLUFFTON TODAY, July 30, 2007, at A7.

250 Pardue, *supra* note 246.

251 *Id.*

252 Kyle Stock, *SCE&G Rates Will Increase by 37 Percent by 2019*, POST & COURIER (Dec. 8, 2016), https://www.postandcourier.com/sce-g-rates-will-increase-by-37-percent-by-2019/article_f81ebd2d-c89d-58c6-94e2-ce7c18e5ad81.html [https://perma.cc/67AB-2UT6].

253 *Id.*

254 *Id.*; John Temple Ligon, *Maryland Drops Nuclear Plant—SCE&G Holds on*, COLUMBIA STAR (Oct. 22, 2010), https://www.thecolumbiastar.com/articles/maryland-drops-nuclear-plant-sceg-holds-on [https://perma.cc/498T-XTRS].

255 Chuck Crumbo, *Utilities Make Nuclear Case–Panel to Discuss Building 2 New Reactors to Serve Growing Needs*, SUN NEWS, Dec. 1, 2008, at C3.

256 Act of Feb. 18, 2004, ch. 4, § 58-4-10, 2004 S.C. Acts 32 (codified as amended at S.C. CODE ANN. § 58-4-10 (2004)).

257 *See* Proposed Base Load Rev. Ord. Submitted by the S.C. Regul. Staff, Docket No. 2008-196-E, at 12, 64-66 (S.C. Pub. Serv. Comm'n Feb. 2009) (explaining the ORS recommendation).

258 Crumbo, *supra* note 255, at C3.

Approximately one month later, the PSC issued an order substantially similar to ORS's proposal, approving advanced cost recovery, the AP1000 as the best design, and Westinghouse as the core contractor.[259] The Commission approved $4.5 billion in capital construction costs for SCANA.[260] Notably, in response to concerns that its order contained too much "risk shifting" onto customers, the PSC wrote:

> The [BLRA] does not allow the Commission to shift risks back to the company . . . nor does the Commission find any justification for doing so . . . . In addition, risk shifting could jeopardize investors' willingness to provide capital for the project on reasonable terms . . . .[261]

Environmental groups challenged the Commission's ruling in state court, but were roundly dismissed, with the court deferring to the Commission's "very thorough and reasoned order."[262] And so, construction proceeded.

By 2010, as the natural gas glut arrived, media and citizen groups began asking questions about the viability of the VC Summer reactors.[263] Santee Cooper, which had initially justified its investment based on growing electricity demand, slashed its projections and began (unsuccessfully) looking for a buyer to share its forty-five percent ownership of the new units.[264]

As of 2012, delays were mounting, but SCANA profits remained strong: in November, the utility reported double-digit profit growth.[265] A construction monitor hired by the ORS painted a "rosy" picture of progress.[266] This pattern of rate increases and profit increases continued over several more years, all with PSC approval.[267] All told, between 2008 and 2015, the PSC approved fourteen rate increases for SCANA, seven of which were specifically to help finance the nuclear reactors.[268] All of these votes were unanimous.[269] Meanwhile, the South Carolina Supreme Court in 2014 ruled

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259 *See* Ord. Approving Combined Application (Final Version), Docket No. 2008-196-E, at 61-74 (S.C. Pub. Serv. Comm'n Feb. 27, 2009).

260 *Id.* at 78-80.

261 *Id.* at 92.

262 Friends of the Earth v. Pub. Serv. Comm'n of S.C., 692 S.E.2d 910, 916 (S.C. 2010).

263 Ligon, *supra* note 254.

264 Warren Wise, *Santee Cooper Might Seek Partner*, POST & COURIER, Sept. 18, 2010, at B7.

265 John McDermott, *Parent of SCE&G Posts 16% Profit Increase Driven Partially by Rate Boost*, POST & COURIER, Nov. 6, 2012, at 1; Roddie Burris, *SCANA Earnings Soar for First Quarter*, STATE, May 1, 2015, at 15.

266 Tony Bartelme, *Two Identical Nuclear Projects, One in Georgia and One in South Carolina. Only One Survived.*, POST & COURIER, Oct. 29, 2017, at 4.

267 Roddie Burris, *SCE&G Counts on Westinghouse, but Vows to Complete Nuke Plant*, STATE, Feb. 16, 2017, at 1-2.

268 Brian Hicks, *SCE&G Keeps Lifting Your Bill Higher and Higher*, POST & COURIER, July 6, 2016, at 2.

269 Andrew Brown, *Early Signs of 'Incompetence at Every Level' Went Unheeded as South Carolina Rushed Toward 'Sexy' Nuclear Future*, POST & COURIER, Aug. 27, 2017, at 1.

against plaintiffs challenging the PSC's approval of these costs, holding that the procedures it followed were an appropriate application of the BLRA.[270]

But outside official channels, doubts mounted. In 2013, state newspapers reported on an academic study finding that "SCANA Corp. and Santee Cooper would save ratepayers almost ten billion dollars over 40 years by scrapping the two nuclear reactors they're building and developing natural gas plants instead."[271] These findings hinged on material conditions in the state: "flat demand and a 73 percent drop in natural gas prices" since the project's 2009 approval.[272]

Regulatory reactions to this reality came slowly. By September 2016—the year the first reactor was initially scheduled to come online—SCANA's portion of the project was $2.5 billion over budget and the utility was seeking yet another rate increase.[273] The public was very much paying attention by now, with 1,350 people notifying the PSC of their opposition to further rate increases.[274] A coalition of community groups calling themselves "STOP THE BLANK CHECK" helped lead these efforts, along with a push to amend the BLRA.[275] The PSC approved a settlement in November 2016 partially responsive to these concerns: it fixed SCANA's total capital costs at approximately $7.7 billion while extending the time frame for the project's completion.[276]

By 2017, South Carolina ratepayers had paid $1.4 billion for the two VC Summer reactors.[277] That ratepayer funding helped the state achieve the dubious honor of having the highest average electricity costs in the nation in 2017, coming in at $173.47 per month—eighteen percent of which came from the planned nuclear plants alone.[278] Still, SCANA reported that the VC Summer project remained a go.[279]

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270 *See* S.C. Energy Users Comm. v. S.C. Elec. & Gas, 764 S.E.2d 913, 915-19 (S.C. 2014).

271 John McDermott, *SCANA, Santee Cooper Should Scrap South Carolina Nuclear Expansion, Report Says*, POST & COURIER (Nov. 2, 2016), https://www.postandcourier.com/business/scana-santee-cooper-should-scrap-south-carolina-nuclear-expansion-report-says/article_06e1d29c-b07a-51d9-a3f5-bod02cb61c05.html [https://perma.cc/9RHL-QMJR].

272 *Id.*

273 David Wren, *Electric Bill 'Look at Whole Picture,' SCANA Chief Says of Nuclear Project Costs*, POST & COURIER, Sept. 23, 2016, at 1.

274 *Id.*

275 *Stop the Blank Check—Coalition Seeks to Stop SCE&G's Blank Check*, COLUMBIA STAR, July 22, 2016, at 1.

276 *See* S.C. Coastal Conservation League's Proposed Ord., Docket No. 2016-223-E, at 3 (S.C. Pub. Serv. Comm'n Nov. 2016).

277 Roddie Burris, *If SCE&G Drops Reactors, Who Pays?*, STATE, Mar. 3, 2017, at 1.

278 William Celmer, *Column: We Pay More for Electricity than Any Other State, but Not All of Us Do*, LANCASTER NEWS, July 28, 2017.

279 *See* Burris, *supra* note 267 (noting that SCANA had "no plans to scrap the now $14.2-billion project").

Then the Westinghouse bankruptcy rocked South Carolina just as it did Georgia—but with a different outcome. Santee Cooper began to agitate for abandonment, as its credit rating was downgraded to "negative" and estimated costs for finishing the project ballooned to nineteen billion dollars.[280] Compounding these challenges, all the delays also put South Carolina's $2.2 billion share of the federal nuclear tax credits at risk, since the terms of these credits required reactors to come online before the end of 2020.[281]

In July 2017, SCANA and Santee Cooper announced they had reached a deal with Toshiba, Westinghouse's parent company, absolving it of any further responsibilities for the VC Summer project in exchange for a $2.2 billion payment.[282] The companies then had to decide whether to proceed on their own. On July 31, Santee Cooper's board voted not to move ahead with the project.[283] Although SCANA had been considering building just one of the reactors, it reportedly could not do so on its own.[284] SCANA thus filed a petition asking the PSC to approve abandonment and to authorize cost recovery for its $4.9 billion spent (per the terms of the BLRA).[285]

Efforts to recover these costs from ratepayers got considerably more complicated a few months later, when South Carolina Governor Henry

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280 David Wren, *Santee Cooper Outlook Stumbles in Wake of Westinghouse Bankruptcy*, POST & COURIER, Apr. 2, 2017, at 9; Raymond Owens, *Santee Cooper Board to Decide Whether to Scrap Nuclear Plant Plans*, NBC-2 WCBD, June 27, 2017, at 1.

281 Wren, *supra* note 280, at 9; Sammy Fretwell, *Could Losing Tax Break Sink SCE&G's Nuclear Project?*, STATE (May 22, 2017, 6:42 PM), https://www.thestate.com/news/local/article151956352.html [https://perma.cc/MF6N-P52A]. Ultimately, in 2018, Congress extended the timeline for credit eligibility. *See US Nuclear Power Policy*, WORLD NUCLEAR ASS'N (Dec. 3, 2024), https://world-nuclear.org/information-library/country-profiles/countries-t-z/usa-nuclear-power-policy.aspx [https://perma.cc/3KAA-A9QW].

282 Sammy Fretwell, *Santee Cooper, SCE&G to Accept Nearly $2.2 Billion from Toshiba for Nuclear Plant*, HERALD (July 28, 2017, 6:48 PM), https://www.heraldonline.com/latest-news/article164043957.html [https://perma.cc/W7GG-L7WH].

283 Sina Gebre-Ab, *Santee Cooper Stops Building Nuclear Plants to Cut Costs, Still Plans to Raise Rates*, CBS-13 WBTW (Aug. 2, 2017, 12:48 AM), https://www.wbtw.com/news/santee-cooper-stops-building-nuclear-plants-to-cut-costs-still-plans-to-raise-rates [https://perma.cc/9ZBA-K9T4].

284 Sammy Fretwell, *SCE&G, Santee Cooper Abandon Nuclear Power Project*, STATE (Aug. 1, 2017, 8:16 AM), https://www.thestate.com/news/local/article164544862.html [https://perma.cc/8NGU-U7BE]; *see also* Thad Moore, *SCANA Has Given Money to Nearly All South Carolina Lawmakers Probing the Failed Nuclear Project*, POST & COURIER (Sept. 3, 2017), https://www.postandcourier.com/business/scana-has-given-money-to-nearly-all-south-carolina-lawmakers-probing-the-failed-nuclear-project/article_2a29f188-8db1-11e7-8b51-a359b0947198.html [https://perma.cc/NK66-FJ7F].

285 See Cindi Ross Scoppe, *SC Nuclear Debacle: A Timeline*, STATE, Sept. 18, 2017, at 2 (noting that Santee Cooper filed an abandonment petition with the PSC in July 2017 requesting "up to $4.9 billion," which it later withdrew "to give legislators and regulators longer to study the situation"). Ultimately, the petition was refiled after merger plans were solidified. *See generally* Joint Application & Petition of S.C. Elec. & Gas Co. & Dominion Energy, Inc., Docket No. 2017-370-E (S.C. Pub. Serv. Comm'n Jan. 12, 2018).

McMaster compelled Santee Cooper to provide him with a 2016 report written by the construction consultancy Bechtel.[286] That report, authored for SCANA and Santee Cooper, found that "the project had no legitimate construction schedule"[287] and cast doubt on Westinghouse's ability to complete the plants, particularly in time to qualify for federal tax credits.[288] However, SCANA intentionally withheld these details from the final version of the report that it shared with state regulators and the Governor.[289]

As the project unraveled, investigators also traced direct lines between campaign contributions from SCANA and ongoing support for the nuclear projects. SCANA donated at least $1.25 million to South Carolina lawmakers and statewide candidates between 2000 and 2017.[290] Those legislators on the Utilities Review Committee that selected PSC representatives received a reported $294,000 from utilities between 2005 and 2018.[291] Campaign contributions skyrocketed nearly 300% in the year before the BLRA.[292] And thirty-one of thirty-two legislators tasked with examining the nuclear fiasco after its abandonment in 2017 also were recipients of SCANA donations.[293]

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286 *See* Andrew Brown & Andy Shain, *Audit Highlighted Problems with South Carolina Nuclear Project a Year Before Cancellation*, POST & COURIER (Dec. 28, 2022), https://www.postandcourier.com/news/audit-highlighted-problems-with-south-carolina-nuclear-project-a-year-before-cancellation/article_9ac96112-9185-11e7-9979-977331ac2233.html [https://perma.cc/Z8D3-WNFB] (reporting that SCANA officials attempted to prevent regulators from accessing the Bechtel report, only turning it in after the Governor's intervention); *see also* BECHTEL, V.C. SUMMER NUCLEAR GENERATING STATION UNITS 2 & 3: PROJECT ASSESSMENT REPORT (2015).

287 Brown, *supra* note 240, at 1.

288 Editorial, *New Proof of Mismanagement*, POST & COURIER (Sept. 14, 2020), https://www.postandcourier.com/opinion/editorials/new-proof-of-mismanagement/article_130564ae-d129-11e7-a759-fbdaa3070474.html [https://perma.cc/8J9P-D4Y7].

289 Brown, *supra* note 240, at 1; *see also* Sammy Fretwell, *Higher Power Bills Due to Nuke Debacle Spark PSC Showdown*, STATE (Dec. 13, 2017, 8:02 AM), https://www.thestate.com/news/politics-government/article189340639.html [https://perma.cc/P3Z2-HGNX] (noting that information showing the project was far behind schedule was removed from the final report shared with state lawmakers). *Compare* BECHTEL, V.C. SUMMER NUCLEAR GENERATING STATION UNITS 2 & 3: PROJECT ASSESSMENT REPORT pt. 5.2 (drft. 2015) (discussing the project's construction schedule), *with* BECHTEL, *supra* note 286, at ii (showing that Part 5.2 was removed in its entirety).

290 Avery G. Wilks & Jamie Self, *How SCANA Spent $1.25 Million at State House Before Nuclear Project Collapsed*, STATE (Sept. 18, 2017, 6:39 PM), https://www.thestate.com/news/politics-government/article173716661.html [https://perma.cc/DKB8-7BLP].

291 Avery G. Wilks, *After Nuclear Fiasco, House Sacks Panel That Oversees Public Service Commission*, STATE (Jan. 24, 2018, 6:42 PM), https://www.thestate.com/news/politics-government/article196434504.html [https://perma.cc/U9LV-AMGG].

292 Wilks & Self, *supra* note 290.

293 *Id.*

As lawmakers and policy analysts looked back at the causes of the debacle, the BLRA came in for considerable blame.[294] So too did the 2004 legislation which modified the consumer advocate's role, eliminating its responsibility to represent ratepayers before the PSC and transferring this duty to the newly-created Office of Regulatory Staff (ORS), which was burdened with the nearly impossible mandate of balancing both consumer and utility interests.[295] Further, problems clearly extended to project oversight and construction. Seasoned nuclear construction workers described the VC Summer job site as "incompetency at every level."[296]

This cornucopia of blame created a rousing debate over how to handle SCANA's $4.9 billion in sunk costs (only a portion of which had already been recovered from ratepayers). One option was to repeal the BLRA retroactively and refuse SCANA any further rate recovery for its investments.[297] SCANA vociferously fought this option, suggesting it would send the utility spiraling into bankruptcy.[298] Another option soon emerged: the large Virginia-based utility Dominion Energy offered to buy SCANA under specified terms that included $1,000 rebates to households but a continued guarantee that another $2.8 billion in nuclear expenditures could be recovered via the rate base for twenty years (amounting to approximately a $4,000 surcharge for the average household over this time period).[299] Dominion lobbied hard at the statehouse and through state media to have the deal accepted.[300] A complicated web of

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294 *See* Brown, *supra* note 269 (emphasizing the lack of legislative scrutiny at the time of the BLRA's passage, and quoting the at-the-time House Majority leader: "We are going to end up regretting this"); Chip Campsen, *How the S.C. Legislature Paved the Way for Nuclear Mess*, POST & COURIER, Aug. 16, 2017, at 013 (arguing that the BLRA granted enormous benefits to the utilities at the expense of the consumer).

295 *See* Act of Feb. 18, 2004, ch. 4, § 6, 2004 S.C. Acts 32 (creating the Office of Regulatory Staff, which took over the consumer advocate's role in representing the consumer while also protecting the utility interests); *see, e.g.*, Sammy Fretwell, *After Paying for Abandoned Nuke Project, Do SC Consumers Need a Stronger Advocate?*, STATE (Aug. 19, 2017, 2:07 PM), https://www.thestate.com/news/article168181267.html [https://perma.cc/7ZE3-FKNX] (noting lawmaker and environmentalist criticism of the ORS's conflicting roles).

296 Brown, *supra* note 269.

297 *See, e.g.*, Colin Demarest, *Report Says Rate Slash Unlikely to Bankrupt SCANA*, POST & COURIER: N. AUGUSTA STAR (June 23, 2023), https://www.postandcourier.com/northaugusta/archive/news/report-says-rate-slash-unlikely-to-bankrupt-scana/article_01945ba5-c34c-50f8-8e52-3cd28792d917.html [https://perma.cc/EYW9-NY5U] (discussing the possibility of repealing the BLRA and the right it grants to utilities to upcharge by eighteen percent).

298 Fretwell, *supra* note 289.

299 *See* Avery G. Wilks, *Should SC Accept Dominion's Buyout of SCANA? Lawmakers Are Skeptical*, STATE (Jan. 18, 2018, 2:55 PM), https://www.thestate.com/news/politics-government/article195376579.html [https://perma.cc/B8J5-62KU] ("[L]awmakers dismissed . . . the deal as a 'payday loan'—an offer to give someone $1,000 if they would pay $4,000 later.").

300 *See* Andrew Brown, *Dominion Running All-Out Media, Lobbying Push to Win over South Carolina Regulators, Lawmakers and the Public*, POST & COURIER, Jan. 11, 2018, at 001.

lawsuits and legislative enactments ensued. Finally, in December 2018, the PSC approved Dominion Energy's purchase of SCANA.[301] This resolution meant that both customers and the (new) utility would absorb some costs of the nuclear debacle, as gross mistakes ultimately overrode even the strong language of the BLRA.[302]

Eventually, the cleanup of South Carolina's debacle would reach into criminal court, with related convictions or plea deals reached on conspiracy, fraud, and false records charges against former House Judiciary chairman Jim Harrison, a key backer of the BLRA;[303] "Westinghouse's top official on the ground at V.C. Summer," Carl Churchman;[304] and the CEO and COO of SCANA, Kevin Marsh and Steve Byrne.[305] Interestingly, arguments in these criminal trials linked the BLRA and excessive corporate risk-taking. The attorney running one grand jury investigation of former CEO Marsh gave a synopsis of these links worth quoting at length:

> How did this happen: How did an otherwise [] good man go astray? . . . . A part of that was the statutory regime that was set up. That would be the Base Load Review Act, the BLRA. It used to be that before a power company could start to bill its customers, a plant had to be up and running and generating power. And the problem was that the financial markets, Wall Street, did not want to pay to build a nuclear power plant, because the risk was too high.
>
> So what was the solution? The solution was to pass a statute, the BLRA, that allowed the power company to, instead of putting that risk on Wall Street, to

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301 Robert Walton, *South Carolina Regulators Approve Dominion Acquisition of SCANA*, UTIL. DIVE (Dec. 17, 2018), https://www.utilitydive.com/news/south-carolina-regulators-approve-dominion-acquisition-of-scana/544500 [https://perma.cc/YG75-X9JL].

302 *Cf. id.* (reporting that although Dominion had to make concessions to the ratepayers, the acquisition offer was still ultimately "a clear win" for the utility).

303 Andy Shain, *Corruption Trial Against Ex-SC Lawmaker Expected to Start in October*, POST & COURIER (Sept. 14, 2020), https://www.postandcourier.com/politics/corruption-trial-against-ex-sc-lawmaker-expected-to-start-in-october/article_4d2ba5b2-a00e-11e8-928a-6b488d959d9d.html [https://perma.cc/VF8V-6MG5].

304 Avery G. Wilks, *Ex-Westinghouse Executive Becomes Third Person to Plead Guilty in VC Summer Nuclear Fiasco*, POST & COURIER (June 10, 2021), https://www.postandcourier.com/business/ex-westinghouse-executive-becomes-third-person-to-plead-guilty-in-vc-summer-nuclear-fiasco/article_69d1407e-c7ce-11eb-b0d0-b389274ff179.html [https://perma.cc/N36D-BNTC].

305 Editorial, '*How Did an Otherwise Good Man Go Astray?' With Help from SC Legislature.*, POST & COURIER (Oct. 17, 2021), https://www.postandcourier.com/opinion/editorials/editorial-how-did-an-otherwise-good-man-go-astray-with-help-from-sc-legislature/article_cbe2b7a4-2c80-11ec-874e-b758cef752aa.html [http://perma.cc/M3XV-56HW]; Press Release, U.S. Dep't of Justice, Former SCANA Executive Pleads Guilty to Conspiracy to Commit Mail and Wire Fraud (July 23, 2020), https://www.justice.gov/usao-sc/pr/former-scana-executive-pleads-guilty-conspiracy-commit-mail-and-wire-fraud [https://perma.cc/C9K5-BUWQ].

> put that risk on Everyday Joe and Everyday Jane, the ratepayers . . . . And that sort of environment created a situation where it divorced the risk from the people that were spending the money. The way the statute is set up, . . . you won if you lost. If the project was a failure, if you abandoned it, you still got to recoup that cost from the customers, as well as rate of return on top of that.[306]

"NukeGate," as it was called by this time,[307] also raised enormous questions about the future of Santee Cooper, the state-owned utility. Whereas there was some ability to ration the pain of the failed project between ratepayers and shareholders of SCANA (cum Dominion), Santee Cooper had no shareholders. Yet the utility was facing nearly four billion dollars in debt, with no clear plan as to how to pay it. Finally, in spring 2021, the legislature unanimously passed[308] an act substantially reforming the governance and oversight of Santee Cooper, but opting to maintain it as a publicly owned utility in the face of private takeover bids.[309] Reflecting back on the VC Summer saga, Santee Cooper's new CEO suggested: "I'm glad they shut it down, because the problem today would be vastly worse had they not done it."[310]

C. *Florida: Slow and Steady Loses Less*

Florida's experience with nuclear power began similarly to Georgia's and South Carolina's but ended short of those states' trajectories. As with other southern states, Florida is served by a mix of IOUs, municipal electric systems, and electric cooperatives. Its nuclear plans were driven by two dominant IOUs, Florida Power & Light (FPL) and Progress Energy (now Duke).[311]

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306 Editorial, *supra* note 305 (internal quotation marks omitted).

307 *See, e.g.*, Ben Wolfgang, *Alan Wilson: Law That Allowed 'NukeGate' to Happen Is Unconstitutional*, WASH. TIMES (Sept. 26, 2017), https://www.washingtontimes.com/news/2017/sep/26/south-carolina-attorney-general-alan-wilson-law-th [https://perma.cc/53ZC-YCGH].

308 *See* S.C. S. JOURNAL, 124th Gen. Assemb., Reg. Sess. (2021), https://www.scstatehouse.gov/sess124_2021-2022/sj21/20210608.htm#p8 [https://perma.cc/5AP9-F4YL] (recording unanimous yea votes on H. 3194); S.C. H.R. JOURNAL, 124th Gen. Assemb., Reg. Sess. (2021), https://www.scstatehouse.gov/sess124_2021-2022/hj21/20210608.htm#p67 [https://perma.cc/9EBW-CQFK] (same).

309 *See* Act of June 15, 2021, § 1, 2021 S.C. Acts 320.

310 Dwayne McLemore, *New Santee Cooper CEO Mark Bonsall Reflects on the V.C. Summer Nuclear Project*, YOUTUBE, at 1:35 (Aug. 27, 2019), https://www.youtube.com/watch?v=p5XaxozctaY.

311 *See supra* Figure 1. NextEra Energy, shown in Figure 1, is the parent company of FPL. Emily Penrod, *Florida Power & Light Doubles Planned Storage Deployments to More than 4 GW over 10 Years*, UTIL. DIVE (Apr. 25, 2024), https://www.utilitydive.com/news/nextera-energy-florida-power-

As in Georgia and South Carolina, these Florida utilities proved unwilling to proceed without substantial derisking at the state level (in addition to the federal derisking initiatives already on offer).[312] As part of sweeping energy reform legislation, the Florida Legislature passed a "nuclear cost recovery clause" in 2006, authorizing utilities to recover prudent costs of licensing and interest during construction, even in the case of abandonment.[313] Several senators later claimed to have had no knowledge that nuclear cost recovery was embedded within the broader energy bill.[314] One reporter described the clause as a "trade-off to the utility companies in exchange for strict new rules intended to encourage the development of renewable energy, energy conservation, and wean the state off its dependence on fossil fuels."[315] The bill was not, however, as full-throated as South Carolina's, given that it required the PSC to review the feasibility and prudency of any authorized projects every year.[316]

The Florida PSC adopted rules operationalizing advanced cost recovery in February 2007.[317] By this point, both FPL and Progress were investigating adding new nuclear and pursuing regulatory approvals: Progress Energy at its Crystal River facility in Levy County, and Florida Power & Light at its

light-fpl-doubles-planned-storage-deployments-four-gigawatts/714246 [https://perma.cc/V9LV-2E4Z].

312 *See* David Fleshler, *House Sees Future in Nuclear Power*, ORLANDO SENTINEL (Oct. 23, 2018, 11:04 AM), https://www.orlandosentinel.com/2006/05/04/house-sees-future-in-nuclear-power [https://perma.cc/Y2U7-MEGT] ("Progress Energy and Florida Power & Light Co. . . . say they need this change to persuade investors to put up the money for nuclear plants, which can cost $4 billion.").

313 Editorial, *Progress Unimportant to $213 Million Payout*, OCALA STAR-BANNER (Oct. 22, 2009, 8:53 AM), https://www.ocala.com/story/opinion/editorials/2009/10/22/editorial-progress-unimportant-to-213-million-payout/31364926007 [https://perma.cc/5XZG-A8VY]; *see also* FLA. STAT. §§ 366.93(2), (6) (2006) (creating cost recovery options for nuclear power plant development, including if the plant is not built).

314 *See* Julie Patel, *Critics Urge Florida to Halt Nuclear Projects that Could Cost $35 Billion*, SUN SENTINEL (June 8, 2018, 11:04 PM), https://www.sun-sentinel.com/2009/10/14/critics-urge-florida-to-halt-nuclear-projects-that-could-cost-35-billion [https://perma.cc/NZ7Z-AXXY] ("Public Service Commission member Nancy Argenziano, who was a state Senator when the nuclear cost provision was passed, said she and many other lawmakers did not know it was part of a broad renewable energy bill they approved . . . ."); *see also* Editorial, *supra* note 313 ("[Senator] Constantine . . . claims he was unaware that the amendment allowed companies to collect money before beginning construction or that there was no provision for refunding the money to customers if a project never became a reality.").

315 Mary Ellen Klas, *Rising Cost of Florida's New Nuclear Power Getting Scrutiny—Customer Groups Ask State Regulators to Require FPL and Progress Energy to Answer How Much New Nuclear Plants Will Cost and when They'll Be Built*, MIA. HERALD, Aug. 1, 2011, at 1.

316 *See* FLA. STAT. § 366.93(5) (2006) (requiring utility to report to the Commission annually with their actual costs compared to their estimated costs); FLA. ADMIN. CODE ANN. r. 25-6.0423(6) (2023) (promulgating the procedural details of the utility's annual report).

317 *See* FLA. ADMIN CODE ANN. r. 25-6.0423(6) (first promulgated 2007).

Turkey Point plant outside of Miami.[318] Again, climate change entered the rhetoric justifying these plants: although Governor Charlie Crist at times emphasized fossil fuel volatility as a reason for building new nuclear,[319] he also frequently linked its desirability to the challenge of climate change.[320] Florida also worried more than nearby states about overreliance on natural gas, with FPL already sourcing fifty percent of its power from that fuel.[321]

FPL and Progress received regulatory approvals to recover pre-construction planning costs in 2009, followed by a familiar trend of delays, cost increases, and rate hikes during 2010 and 2011. The 2009 approvals came just a month after a scandal in which several top PSC staffers were forced to resign based on "too-cozy relationship[s]" with FPL executives.[322] Changes to PSC staff apparently had minimal impact, as the PSC authorized rate hikes for FPL over the objection of the Office of Public Counsel, which argued that the plans to build were too speculative to merit cost recovery.[323] The PSC's decision drew the ire of the Southern Alliance for Clean Energy, which, in 2011, mounted a lawsuit alleging that advanced cost recovery for nuclear energy projects amounted to an unconstitutional delegation of authority to the PSC.[324] The case wound its way to the Florida Supreme Court in 2013, which upheld the delegation.[325]

By this point, concerns had spread. In 2013, the Florida Legislature revisited the wisdom of its nuclear cost recovery law. Progress's President's testimony at hearings in March 2013 highlighted the uncertainty that still surrounded the utility's thinking on whether to develop new nuclear energy

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318 *See* Klas, *supra note* 315, at 1 (describing how Progress Energy and FPL charged higher rates to build new nuclear plants but have made only insubstantial progress).

319 Asjylyn Loder, *Nuke Plant Price Triples*, TAMPA BAY TIMES, Mar. 11, 2008, at 1A.

320 *Cf.* State of Fl., Off. of the Governor Charlie Crist, Establishing Immediate Actions to Reduce Greenhouse Gas Emissions Within Florida, Exec. Order 07-127 (July 13, 2007), http://www.fsec.ucf.edu/en/media/enews/2007/pdf/07-127-emissions.pdf [https://perma.cc/V8R4-Y8GS] (justifying several executive measures to reduce greenhouse gas emissions by emphasizing the great importance of climate change to Florida).

321 *See* Asjylyn Loder, *Higher Costs Don't Daunt Nuclear Backers—The Governor and Other Supporters Say the Alternatives Have Drawbacks Nuclear Doesn't*, TAMPA BAY TIMES, Dec. 16, 2007, at 1D ("Florida's dependence on natural gas worries many in the industry. With new coal production unlikely, Florida could get 50 percent of its power from natural gas by 2016 . . . .").

322 Bill Kaczor, *Top PSC Staffers Quit Over Ethics Questions*, LEDGER (Sept. 9, 2009, 3:15 AM), https://www.theledger.com/story/news/2009/09/08/top-psc-staffers-quit-over-ethics-questions/26207412007 [https://perma.cc/E8ZL-X334].

323 Mary Ellen Klas, *Regulators Agree to Let FPL Raise Rates to Pay for Possible Nuclear Plants*, MIA. HERALD, Oct. 24, 2011, at 1.

324 Mary Ellen Klas, Doug Hanks & David Smiley, *Energy Advocates: State Nuclear Cost Recovery Bill Is Unconstitutional*, MIA. HERALD: NAKED POL. (Jan. 23, 2012, 6:59 PM), https://miamiherald.typepad.com/nakedpolitics/2012/01/energy-advocates-state-nuclear-cost-recovery-bill-is-unconstitutional.html [https://perma.cc/KS29-9YJP].

325 S. All. for Clean Energy v. Graham, 113 So. 3d 742, 751 (Fla. 2013).

projects, despite having spent hundreds of millions of ratepayer dollars to pursue the Levy County project (all rate-based, and thus including a ten-percent return to the utility).[326] Project cost estimates had ballooned during these studies, causing legislators to worry that advanced cost recovery was a "shell game."[327] Ultimately, the legislature did not repeal the law but added restrictions on the types and timing of cost recovery available.[328]

The speculative nature of FP&L's and Progress's nuclear plans proved their greatest blessing. Florida utilities simply never moved as aggressively as Georgia or South Carolina utilities in pursuing nuclear energy, which caused their ultimate abandonment to be a much easier call and much less disastrous blow to ratepayers. By 2013, Duke Energy had taken over Progress and inherited its Levy County nuclear development plans.[329] New management decided to throw in the towel, officially abandoning the plants in 2013.[330] FP&L dragged its heels longer, but prospects continued to dim. In 2017, in a 4–1 decision and after $282 million spent, the PSC rejected FP&L's request to re-up cost recovery for its nuclear planning.[331] That same fall, the PSC approved a Duke settlement to write off approximately $150 million of the funding it had spent on the Levy County reactors[332]—after it had already recouped $800 million in ratepayer funding.[333] As part of this settlement, Duke also agreed to develop 700 megawatts of solar power over the following four years.[334]

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326 Ivan Penn, *Senate Committee Hears Arguments over Advance Fee for Building Nuclear Plants*, TAMPA BAY TIMES (Mar. 19, 2013), https://www.tampabay.com/news/business/energy/senate-committee-hears-arguments-over-advance-fee-for-building-nuclear/2109741 [https://perma.cc/2YWU-JJST].

327 *Id.*

328 *See* Act of June 14, 2013, §§ 2–3, 2013 Fla. Laws ch. 2013-184, 2-4 (imposing various cost recovery restrictions on utilities either awaiting a license or Commission approval).

329 *Duke Energy and Progress Energy Merge Nuclear Fleets*, DUKE ENERGY (July 5, 2012), https://nuclear.duke-energy.com/2012/07/05/duke-energy-and-progress-energy-merge-nuclear-fleets [https://perma.cc/AX2D-E2Q9].

330 *Florida Regulators OK Plan to Drop Nuclear Fee Off Bills*, ASSOCIATED PRESS STATE WIRE: FLA., Apr. 16, 2015, at 1.

331 Mary Ellen Klas, *State Rejects FPL Bid to Charge Users Millions for Nuke Plant It May Never Build*, MIA. HERALD (Nov. 16, 2017, 5:41 PM), https://www.miamiherald.com/news/local/community/miami-dade/article179288571.html [https://perma.cc/G8ME-ZLDL].

332 Jim Saunders, *Regulators Sign Off on Duke Energy Settlement Deal*, LEDGER (Oct. 26, 2017, 7:06 AM), https://www.theledger.com/story/news/state/2017/10/26/regulators-sign-off-on-duke-energy-settlement-deal/17965713007 [https://perma.cc/XXE8-577P].

333 Brad Rogers, *An $800 Million Rip-Off That's All Legal*, OCALA STAR-BANNER (Sept. 3, 2017, 2:01 AM), https://www.ocala.com/story/opinion/columns/2017/09/03/brad-rogers-800-million-rip-off-thats-all-legal/18908070007 [https://perma.cc/2ML7-XESU].

334 Saunders, supra note 332.

D. *North Carolina: Can't Fool Me Twice*

Among our four case study states, North Carolina pursued nuclear development the least vociferously. One possible reason for North Carolina's more gradualist approach is that it had the most recent painful history: In the late 1990s, the state's consortium of municipally owned utilities almost went bankrupt due to their investments in a failed nuclear reactor.[335] Ultimately, they remained intact only by enacting substantial rate hikes on municipal customers.[336]

It was against this backdrop that in 2005, Duke Energy—the state's largest investor-owned utility—announced that it was considering building a new nuclear reactor to serve North Carolina, adding to the three nuclear plants it already owned.[337] Duke executives explained the decision in economic and climate terms, pointing to nuclear energy's low-fuel costs and lack of carbon emissions.[338] Progress Energy, the state's second investor-owned utility, also announced nuclear plans in 2005, with company officials describing the new federal benefits as "gravy" that "help[s] with risk mitigation."[339] Both utilities opted for the same Westinghouse reactor design. Progress Energy estimated that the plant would cost two to three billion dollars, which they assured regulators would be offset "by the dirt-cheap cost of uranium."[340]

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335 Eric Dyer, *Fight Stirs over Proposed Power Surcharge\The Surcharge Could Be Part of a Legislative Panel's Recommendations on Utility Deregulation*, GREENSBORO NEWS & REC. (June 26, 2000), https://greensboro.com/article_261464ad-571e-5bf7-a7f5-90890ef0c335.html [https://perma.cc/WSA3-4MJA].

336 *See* Pat Stith, *High-Voltage Debt*, NEWS & OBSERVER, Jul. 15, 2001, at A1 ("To make the debt payments, [cities that invested in nuclear] charge residential and business rates that average 20 percent to 25 percent above . . . the state's two biggest investor-owned utilities. Over a year, the difference is about $240 for the average household."); *see also* Conor Harrison, *The Historical-Geographical Construction of Power: Electricity in Eastern North Carolina*, 18 LOCAL ENV'T: INT'L J. JUST. & SUSTAINABILITY 469, 483 (2013) (describing how nuclear energy investment left "the investing towns deeply indebted, with their citizens paying electricity rates far higher than in neighbouring towns").

337 Stan Choe, *Duke Power Mulls New Nuclear Plant*, CHARLOTTE OBSERVER, Feb. 18, 2005, at 1D.

338 Tim Funk & Bruce Henderson, *Duke May Try to Add Nuclear Facility—As Demand for Power Grows, Utility Talks with Regulators About Options*, CHARLOTTE OBSERVER, Mar. 15, 2005, at 1A.

339 John Murawski, *$2 Billion Riding on Nuclear Initiative*, NEWS & OBSERVER, Sept. 8, 2005, at A1; *see also* Stan Choe, *Progress Energy Ponders Nuclear—Company Joins Duke Energy in Notifying U.S. of Consideration*, CHARLOTTE OBSERVER, Aug. 30, 2005, at 2D.

340 John Murawski, *Putting a Price on Nuclear Power*, NEWS & OBSERVER, Feb. 19, 2006, at E1; *see also* Ray Gronberg, *2nd Reactor May Come to Area Site Shearon Harris Selected for Utility's Tentative Nuclear Plans*, HERALD-SUN, Jan. 24, 2006, at A1; Elyse Ashburn, *Nuclear Site a Possibility Near Triad*, GREENSBORO NEWS & REC., Nov. 1, 2005, at A1.

Duke, however, was similar to other southern utilities in wanting further legal assurances of cost recovery before proceeding with a nuclear option.[341] Accordingly, it pushed legislation at the North Carolina General Assembly to add a section to the state's Public Utility Code explicitly authorizing advanced cost recovery of "[a]ll reasonable and prudent project development costs" for new nuclear facilities, as well as advanced cost recovery for construction costs themselves—even in the case of prudent abandonment.[342] This language was approved as part of a larger 2007 bill that also enacted a renewable portfolio standard for the state, in a move that angered critics who objected to saddling renewable energy with nuclear baggage.[343]

A familiar pattern of rising costs followed. In 2010, Duke's anticipated preconstruction costs had risen to $459 million, for which it returned to the North Carolina Utilities Commission (NCUC) to seek recovery, largely on greenhouse-gas-emissions reduction grounds.[344] Simultaneously, Duke and Progress's CEOs made an unsuccessful push for further revisions to North Carolina's advanced cost recovery laws, arguing that the requirement that utilities submit to an annual hearing on advanced cost recovery made the process too cumbersome and that streamlining review was essential.[345]

In a 2011 Order, the NCUC hedged its approval, finding it appropriate for Duke to incur "only those nuclear project development costs that must be incurred to maintain the status quo . . . up to a maximum of the North Carolina allocable portion of $120 million."[346] In its reasoning, it explained that the cost-effectiveness of nuclear power hinged *entirely* on assumptions made about federal carbon legislation. Duke's planning showed that with a substantial carbon price, "two nuclear units in 2021 and 2023 were $1.8 billion more cost-effective than [natural gas] . . . . Under a no-carbon regulation

341 Notably, the North Carolina Attorney General had taken the position that existing North Carolina law did not allow advanced cost recovery. *See* Att'y Gen.'s Comments, Docket No. E-7, Sub 819, at 4-5 (N.C. Utils. Comm'n Oct. 17, 2006); Ord. Issuing Declatory Ruling, Docket No. E-7, Sub 819, at 4 (N.C. Utils. Comm'n Mar. 20, 2007); *see also* Comments of the Pub. Staff, Docket No. E-7, Sub 819, at 5-6 (N.C. Utils. Comm'n Oct. 17, 2006) (describing the request for payment before a plant comes into service as "a departure from . . . traditional ratemaking practice").

342 *See* Act of Aug. 20, 2007, 2007-397, § 7, 2007 N.C. Sess. Laws 1184, 1200-02 (codified at N.C. Gen. Stat. §§ 62-110.6 to 62-110.7 (2023)); *see also* N.C. GEN. STAT. § 62-110.1 (2023) (permitting cost-recovery for instances where the construction of the facility is cancelled).

343 *See* Act of Aug. 20, 2007, 2007-397, 1007 N.C. Sess. Laws 1184, 1200-10; N.C. GEN. STAT. § 62-110.7 (2023); Jim Warren, *Will We Pay, Again, For Nuclear Folly?*, NEWS & OBSERVER, July 13, 2007, at A11 (criticizing the prioritization of nuclear plants as "a ruinous approach to global warming").

344 Amended Application for Approval of Decision to Incur Nuclear Generation Project Dev. Costs, Docket No. E-7, Sub 819, at 7 (N.C. Utils. Comm'n Nov. 15, 2010).

345 John Murawski & Bruce Henderson, *Nuclear Goals Stoked by Duke-Progress Merger*, NEWS & OBSERVER, Jan. 16, 2011, at 1.

346 Ord. Approving Decision to Incur Limited Additional Project Dev. Costs, Docket No. E-7, Sub 819, at 4 (N.C. Utils. Comm'n Aug. 5, 2011).

scenario, the [natural gas] portfolio was $3 billion more cost-effective than the two nuclear unit portfolio."[347]

Following this ruling, Duke's plans for nuclear power for North Carolina petered out. Although Duke continued to file semi-annual reports of costs incurred to maintain its status quo position with respect to development for six years,[348] the Westinghouse bankruptcy and South Carolina's decision to abandon the VC Summer reactors effectively killed any lasting project momentum. Duke officially requested to cancel the project in 2017 and petitioned the NCUC to recover $542 million in costs incurred.[349] As part of a larger proceeding in 2018, the NCUC approved cancellation and allowed recovery of almost all of these costs, though it refused—over Duke's protest—to allow a rate of return on the unamortized balance (i.e., the company got its money back, but was not allowed to earn profits on the spending).[350]

Meanwhile, Progress Energy made it even less far in plans for new reactors at Shearon Harris, never officially approaching the Commission about advanced cost recovery. After a 2011 merger with Duke, the proposed Shearon Harris plants quietly disappeared from the company's fifteen-year plan, never to be resurrected.[351] Nuclear dreams in North Carolina thus faded. In the coming years, the state would go on to make a name for itself as a leader in a different type of carbon-free electricity generation: solar power.[352]

E. *Reflecting on the Southern Approach to Nuclear Derisking*

Across the southeast, federal derisking legislation proved only a starting point for discussions about how to adequately derisk nuclear power. Even public utility law, with its strong protections for cost recovery for prudent investments, was insufficient to spur utilities into action. It took (1) federal fiscal derisking in EPAct 2005, (2) layered on top of federal regulatory derisking in the form of liability insurance and streamlined permitting regimes, coupled with (3) state public utility rate regulation *and* (4) additional

347 *Id.*

348 *See generally, e.g.*, Rep. Preconstruction Costs for Lee Station Project Dev. Activities Jan. 1, 2011–Dec. 31, 2014, Docket No. E-7, Sub 819 (N.C. Utils. Comm'n Jan. 29, 2015).

349 Duke Energy Carolinas, LLC's Request for Approval to Cancel the Lee Nuclear Project & to Consolidate Dockets, Docket No. E-7, Sub 819, at 7, 18 (N.C. Utils. Comm'n Aug. 25, 2017).

350 Ord. Accepting Stipulation, Deciding Contested Issues, and Requiring Revenue Reduction, Docket Nos. E-7, Sub 1146, 829, 2252 & 1110, at 151-52, 160-63 (N.C. Utils. Comm'n June 22, 2018).

351 John Murawski, *Progress Energy's Nuclear Plans on Hold for Now*, NEWS & OBSERVER, May 1, 2012, at 1.

352 *See North Carolina: State Profile and Energy Estimates*, U.S. ENERGY INFO. ADMIN. (Feb. 15, 2024), https://www.eia.gov/state/analysis.php?sid=NC [https://perma.cc/7BEM-UETG] (ranking North Carolina fourth in the nation for total solar power generation and capacity as of 2022, behind California, Texas, and Florida).

state derisking initiatives all but guaranteeing full cost recovery just to convince utilities to attempt new nuclear builds. All told, these derisking measures cost state ratepayers tens of billions of dollars that they will pay through their bills (to varying degrees) for decades to come, in addition to the costs to federal taxpayers of its derisking initiatives. Almost twenty years later, these incentives resulted in a total of two new nuclear reactors totaling just over 2200 MW ultimately coming online, grossly overbudget and behind schedule.

All told, if not a complete failure, the outcomes certainly cannot be said to have lived up to proponents' dreams of a nuclear renaissance. What's more, Georgia and South Carolina—the two states that made enormous nuclear investments—lagged in many measures of electricity affordability in the years following these investments, including average energy expenditures per household and low-income "energy burden" (the percentage of household expenditures devoted to energy) (see Table 2).

Table 2: Comparative Assessment of Electricity Outcomes as of 2024[353]

State	Residential electricity price, cents/kWh	Energy expenditures per household	Energy burden for low-income household AMI* 0-30%	Energy burden for low-income household AMI* 30-60%
NC	11.62	$1,731	14%	6%
SC	13.59	$1,918	18%	7%
GA	13.8	$2,180	17%	6%
FL	13.9	$1,654	13%	5%
National Average	15.04	$1,884	13%	5%

In this final Section, we draw from interviews and broader commentary to distill some common threads and differences among our study states. Interview data quoted below comes from twenty semi-structured interviews that we conducted between 2018 and 2021 with current and former high-ranking stakeholders in the southeastern U.S. electricity industry, including utility executives, former regulators, legislators, industrial lobbyists, and environmental advocates in each of the case study states.[354]

One recurrent question in the post-mortem analysis of this failed renaissance has been whether the South's approach to nuclear power was a mistake only in retrospect or misguided from the start. We discussed this

353 Data derived from U.S. ENERGY INFO. ADMIN., ELECTRIC POWER MONTHLY 2024 tbl.5.6.A (2024) (Average Price of Electricity to Ultimate Customers by End-Use Sector, by State, November 2023 and 2022), https://www.eia.gov/electricity/monthly/archive/january2024.pdf [https://perma.cc/85ZV-FA52]; U.S. ENERGY INFO. ADMIN., 2020 RESIDENTIAL ENERGY CONSUMPTION SURVEY (RECS) tbl.CE1.1.ST (2023) (Summary Annual Household Site Consumption and Expenditures in United States by State—Totals and Intensities), https://www.eia.gov/consumption/residential/data/2020/state/pdf/ce1.1.st.pdf [https://perma.cc/Y2NM-TES6]; EMILY A. SHRIDER & JOHN CREAMER, U.S. CENSUS BUREAU, P60-280, POVERTY IN THE UNITED STATES: 2022 (2023), https://www.census.gov/library/publications/2023/demo/p60-280.html [https://perma.cc/H3QX-H7YR]; *Low-Income Energy Affordability Data (LEAD) Tool*, U.S. DEP'T OF ENERGY, https://www.energy.gov/scep/slsc/lead-tool [https://perma.cc/8CK9-8GXN] (last visited Dec. 2, 2024) (select "Area Median Income," check box for one data range at a time—"0-30%" or "30-60%"—and uncheck all other options).

354 All interviews were conducted under a protocol approved by the University of South Carolina Institutional Review Board. We gained access to this group by using professional and university contacts. Subsequent participants were identified using a mix of snowball and purposive sampling. Interviews were recorded but interviewees were granted anonymity. Accordingly, we identify interviewees only by their industry position or state affiliation.

question with numerous interviewees, who split in their assessments. Some were sympathetic to their states' decisionmaking processes—for example, one South Carolina interviewee insisted that SCANA "clearly demonstrated [need] in 2008 when they came in for their certificate to build those plants." Yet, "by the time they got to 2015, all of a sudden low natural gas prices, conservation, solar, they had all had impacts to the point that they didn't need any of that load." Another interviewee intimately involved in nuclear decisionmaking explained: "I understood it was a big bet. But I didn't think it was necessarily a bad decision."

Other interviewees emphasized that for southern states at the time, nuclear clearly appeared the most politically feasible way to tackle climate change—and that the likelihood of federal climate legislation made leaning into nuclear a smart bet for the South. For example, one former regulator explained that the idea that carbon regulation was coming down the pike was "a big part" of the decision to build nuclear, "because there was the assumption that carbon was going to be expensive."

Other interviewees projected this logic forward to justify Georgia's decision to complete its nuclear plants. As one explained, "when those plants are built, and up and generating, we're going to have more power in the Southeast than we know what to do with." Another explained that clean, baseload nuclear, which "runs 24-7," will "take care of [his] grandchildren."

Some interviewees, in contrast, insisted that those in the know were savvy to the folly of pursuing new nuclear even in the early 2000s. As one industrial lobbyist explained:

> I was there when Westinghouse was going around peddling the AP1000 design claiming that it can be built for the same price as pulverized coal. And I vividly remember going to [name redacted] and saying they are lying to you. There is no way in hell you can build a nuclear plant at the same price as pulverized coal . . . . [But] Westinghouse was peddling it, and South Carolina General Assembly is stupid enough to pass a law to make it financially possible for a $4 billion-dollar market capitalized SCE&G to try to build a $12 billion [nuclear plant], that's the lunatic stuff.

This quote gets at a point that other interviewees also made: South Carolina, of all southern states, was the worst positioned to go big on nuclear power. The state simply had too small a customer base to absorb the cost overruns frequently associated with nuclear development. We return to this scale point in the next Section.

It is noteworthy that our study states all opted to pass legislation *regulatorily* derisking nuclear power by enhancing public utility law's promise of rate recovery. These regulatory derisking tools were pivotal to nuclear

power's development. But they were also, in the eyes of many, more muscular than was either wise or necessary. As many commentators and interviewees observed, the structure of these legislatively authorized contracts with utilities created little incentive for cost containment.[355] Although states' legislation putatively required that cost overruns be determined prudent, in practice it was difficult for commissions to parse these details—and there was little appetite for doing so once hundreds of millions or billions of dollars had been sunk into these investments.[356] This outcome accords with the relational contracting literature that predicts just these kind of hold-out situations in complex, long-term contracting arrangements.[357]

Moreover, across southern states, the judiciary appeared largely unwilling to intervene in disputes over the wisdom of nuclear power. Although public interest plaintiffs frequently challenged regulatory decisions approving nuclear cost recovery, courts were wary of second-guessing expert regulatory agencies on nuclear power determinations.[358] Only in the aftermath of two nine-billion-dollar holes in the ground did South Carolina's courts squarely take up the question of whether its legislation authorizing extremely permissive cost recovery was constitutional—and even then, no decision was reached before settlement.[359] As is frequently the case with complex, technical matters of energy policy, the courts proved themselves ill-equipped oversight institutions for energy derisking decisions.

In South Carolina and Georgia, state governance challenges were exacerbated by on-the-ground construction woes. The failure of

355 *See supra* notes 275, 294, 306 and accompanying text.

356 *Cf.* Lynne Holt & Theodore J. Kury, *Florida's Plans to Finance New Nuclear Plants*, 65(4) BULL. ATOMIC SCIENTISTS 31, 35 (2009) ("Florida's approach of allowing accelerated cost recovery places an enormous emphasis on the Commission staff's ability to analyze the prudency of project costs.").

357 *See* Aneil Kovvali & Joshua Macey, *Private Profits & Public Business*, 103 TEX. L. REV. (forthcoming) (manuscript at 19-20), https://law-economic-studies.law.columbia.edu/sites/default/files/content/Private%20Profit%20and%20Public%20Business%20for%20Columbia%20Law%20and%20Econ%20Workshop.pdf [https://perma.cc/6C5S-PNUH] (tracing these challenges across situations of government contracting with private companies, including electric utilities); *see also* OLIVER E. WILLIAMSON, MARKETS & HIERARCHIES: A STUDY IN THE ECONOMICS OF INTERNAL ORGANIZATION 91-93 (1975) (noting that, while incomplete contracts do not impede efficiency when potential revenue and cost streams can easily be estimated and both parties are fully truthful, this assumption falls apart in practice).

358 *See, e.g.*, *supra* notes 324–325 and accompanying text (discussing the Supreme Court of Florida's rejection of an unconstitutional delegation challenge to Florida PSC).

359 The settlement was purportedly influenced by an advisory opinion of the state's attorney general laying out the case for why the Base Load Review Act was an (exceedingly rare) unconstitutional taking of *ratepayer* dollars by the utility. Iulia Gheorghiu, *SCE&G Rate Hikes Called 'Unconstitutional' by South Carolina AG*, UTIL. DIVE (Apr. 23, 2018), https://www.utilitydive.com/news/sceg-rate-hikes-called-unconstitutional-by-south-carolina-ag/521979 [https://perma.cc/SXP3-UMZA].

Westinghouse to deliver on its contractual obligations was, for some, the most surprising. (Though of course, it is important to put interviewees' surprise in the context of a long history of construction delays and overruns at nuclear plants in the United States) As one interviewee involved in debates over VC Summer mused: "[M]y God they are building nuclear plants in Argentina; we can't build one here? . . . . I mean, who would have thought?" Moreover, because all states opted into the same reactor design—assuming it would economize construction costs due to modularity and learning-by-doing—Westinghouse's bankruptcy had a domino effect that cascaded across the states, stopping most projects dead in their tracks.

There were also important differences in southern states' approaches to nuclear power promotion. Notably, Florida and North Carolina proceeded more stepwise and cautiously than South Carolina and Georgia. Our interviewees offered several reasons for this discrepancy. One had to do with institutional competency. Contrasting the two Carolinas, one South Carolina interviewee explained: "North Carolina had . . . much more educated Commissioners, they were appointed by the Governor."[360] Others suggested that some of the differences among states could be attributed to the cultures of the various utilities involved. And still others suggested that differences in the states' nuclear cost recovery statutes were important determinants of outcomes, with those laws that allowed for no regulatory scrutiny of utility costs and decisions incentivizing more risk taking. We pick up on several of these distinctions in the following and final Part, which interrogates what can be resurrected from the ashes of this largely failed experiment as the United States pursues even larger scale derisking of a new generation of climate technologies.

IV. LESSONS FOR CLIMATE DERISKING

It would be tempting to conclude that the prevailing takeaway from our case study is simply, "don't do what those southern states did." But this conclusion is facile. To be sure, these states' decisions in retrospect look like mistakes. But it is *only* these states that undertook the nuclear experimentation that federal policy intended to spur. If the recent round of climate derisking legislation is to have the massive impact hoped for in creating new industries and driving rapid emissions reductions, it will require bold actors—like these southern states and their utilities—to step in.[361] Only they must do it more successfully this time.

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360 Other interviewees described several South Carolina commissioners as lacking high school diplomas and Florida commissioners as "a whole slew of wild men."

361 *Cf.* Boyd & Carlson, *supra* note 192, at 850 ("[T]he only way to know if nuclear power can be a key component of efforts to decarbonize the power sector is to build new reactors.").

Many nuclear proponents are now painting Georgia's egregious expenditures to bring new nuclear online as a productive failure toward future nuclear success—a "first-of-a-kind" technology challenge.[362] After all, successes in innovation often require accepting some preceding failures.[363] It is easy to see why they want this to be true: if it can be built affordably, nuclear power offers an enticing solution to the core decarbonization challenge of stabilizing electricity supply on a grid comprised largely of variable renewable resources.[364] New nuclear power might also help meet surging projections for growth in demand, which have escalated recently due to a confluence of increased domestic manufacturing and rapid growth in data centers (largely fueling artificial intelligence).[365]

These forces are driving significant revamped interest in nuclear power from multiple quarters, including Congress, the Department of Energy, numerous state legislatures, and some private investors. It is worth noting, however, that most of these nuclear backers are pushing small modular reactor (SMR) technologies as the "next generation" of nuclear power, rather than advocating for building more large reactors of the type completed in Georgia.[366] SMRs, as the name suggests, are smaller reactors that proponents

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362 *See* Zach Bright, *After Vogtle, What's Next for Nuclear?*, E&E NEWS (Apr. 30, 2024, 6:53 AM), https://www.eenews.net/articles/after-vogtle-whats-next-for-nuclear [https://perma.cc/R6RM-ABCQ] (quoting nuclear proponent insisting that Southern Company's challenges "are unique to first-of-a-kind projects").

363 *See generally* Mark D. Cannon & Amy C. Edmondson, *Failing to Learn and Learning to Fail (Intelligently): How Great Organizations Put Failure to Work to Innovate and Improve*, 38 LONG RANGE PLAN. 299 (2005).

364 *See Nuclear*, U.S. DEP'T OF ENERGY, https://www.energy.gov/nuclear [https://perma.cc/JEC3-H5ZX] (last visited Dec. 2, 2024).

365 *See generally* JOHN D. WILSON & ZACH ZIMMERMAN, GRID STRATEGIES, THE ERA OF FLAT POWER DEMAND IS OVER (2023), https://gridstrategiesllc.com/wp-content/uploads/2023/12/National-Load-Growth-Report-2023.pdf [https://perma.cc/D84G-N5CJ].

366 *See, e.g.*, Off. of Nuclear Energy, *Advanced Small Modular Reactors (SMRs)*, U.S. DEP'T OF ENERGY, https://www.energy.gov/ne/advanced-small-modular-reactors-smrs [https://perma.cc/EJH4-KD54] (last visited Aug. 21, 2024); *see also* Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy Act (ADVANCE Act), Pub. L. No. 118-67, § 202, 138 Stat. 1448, 1457 (2024) (to be codified at 42 U.S.C. § 2133) (specifically targeting advanced nuclear reactors); Press, Release, U.S. Dep't of Energy, DOE Announces $900 Million to Accelerate the Deployment of Next-Generation Light-Water Small Modular Reactors (June 17, 2024), https://www.energy.gov/articles/doe-announces-900-million-accelerate-deployment-next-generation-light-water-small-modular [https://perma.cc/NWW6-92WN]. Southern Company's CEO has also expressed a preference for SMRs. *See* Spencer Kimball, *U.S. Needs Major Nuclear Power Expansion to Meet Rising Electricity Demand, Southern Company CEO Says*, CNBC (June 27, 2024, 4:53 PM), https://www.cnbc.com/2024/06/27/us-needs-major-nuclear-power-expansion-southern-company-ceo-says.html [https://perma.cc/C2A4-JCGL]. *But see* Catherine Morehouse, *DOE Official: Vogtle Start Up Could Open Door for New Large Nuclear Plants*, POLITICOPRO (May 15, 2024, 1:22 PM), https://subscriber.politicopro.com/article/2024/05/doe-official-vogtle-start-up-could-open-door-for-new-large-nuclear-plants-00157988 [https://perma.cc/DC8K-6BT2] (quoting

hope can be more quickly and affordably assembled at a wider range of sites, that also often employ advanced new technologies.[367] Support for SMRs is not universal among utilities. For example, NextEra Energy CEO John Ketchum famously quipped in an investor call that SMRs are a way to "lose money in smaller batches."[368] That said, if SMRs are the future, then the expensive nuclear derisking initiatives of the past twenty years offer limited transferable technological or construction know-how.

There is a bigger problem, however, facing nuclear energy today: the private sector remains, by and large, uninterested, despite the layered derisking incentives available in the Energy Policy Act, Inflation Reduction Act, new 2024 federal legislation, and additional state laws.[369] As one commentator has explained it, "[n]obody wants to project-manage the next Vogtle."[370] Thus, if Georgia's experiment is to be redeemed as a step on the road to nuclear power as a climate savior, it will require a more nuanced understanding of what it takes to build nuclear power—and how the South's unfortunate and costly experiences can be confined to history.

We are also interested in looking beyond nuclear power to the broader lessons that the failed nuclear experiment offers for the prospects of achieving a clean energy transition via derisking policy. Extrapolating requires care, because other resources in the transition do not share every characteristic of nuclear power. Nuclear power's construction is extraordinarily complex and specialized, and its regulatory requirements are more onerous than those of most other technologies.[371] Many thus hope that nuclear power is idiosyncratic, such that its failure portends little trouble for using derisking to promote additional clean energy technologies.

Without intending to minimize salient differences, we think the failed nuclear renaissance offers a suite of valuable lessons for building many kinds of risky new clean energy infrastructure. One might arrange the technologies that the IRA and IIJA hope to promote on a spectrum of "riskiness" (of both the fiscal and regulatory varieties). Onshore wind and solar are relatively inexpensive, well-known technologies that have traditionally been deployed

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DOE official suggesting that utilities should capitalize on the experience gained in Georgia and build bigger reactors).

367 *See* Off. of Nuclear Energy, *supra* note 366.

368 Darren Sweeney, *NextEra CEO Sees US Climate Law Catalyzing Decades of Clean Energy Growth*, S&P GLOB. (Oct. 3, 2022), https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/electric-power/100322-nextera-ceo-sees-us-climate-law-catalyzing-decades-of-clean-energy-growth [https://perma.cc/3US2-8DDD].

369 At present, only one demonstration reactor is under construction in the United States. *See infra* notes 420–422 and accompanying text.

370 Spector, *supra* note 20; *see also* Emmy Hawker, *Will Investors Go Nuclear?*, ESG INV. (July 19, 2022), https://www.esginvestor.net/will-investors-go-nuclear [https://perma.cc/3W74-RFHP].

371 Hammond & Spence, *supra* note 121, at 174-85.

via a combination of financial derisking and state-guided decarbonization policies.[372] These projects are least analogous to nuclear energy, as they do not have the same strenuous regulatory requirements or high technical complexity during construction and operation. One might predict that fiscal derisking is thus sufficient to induce significant renewables buildout, and there is evidence to support this intuition: there are now far more gigawatts of renewable energy and storage projects waiting to connect to the U.S. electricity grid than there are *total gigawatts on the grid*.[373] But because of sclerotic queue processes, difficulties in local siting approvals, and insufficient investments in electricity transmission, only approximately twenty percent of projects (and fourteen percent of capacity) seeking connection from 2000 to 2018 had reached commercial operations as of the end of 2023.[374] As these statistics suggest, even modular, affordable infrastructure such as onshore wind and solar require state intervention beyond fiscal derisking to proceed at the scale and pace demanded by the clean energy transition.[375]

The lessons from nuclear energy are even more salient for technologies that more closely mirror nuclear power in their regulatory complexity, high capital costs, uncertain commercial potential, and physical risks. We include in this category offshore wind;[376] carbon capture and storage technologies that

372 *See* sources cited *supra* note 14; *see also* Christophers, *supra* note 6, at 1523-28 (describing the "historic importance of subsidies in driving development" of solar and wind power). In addition, state-level renewable energy requirements placed on their utilities have been an important guarantor of clean energy demand. GALEN BARBOSE, LAWRENCE BERKELEY NAT'L LAB'Y, U.S. RENEWABLES PORTFOLIO STANDARDS: OVERVIEW OF STATUS AND KEY TRENDS 23 (2015), https://www.cesa.org/wp-content/uploads/Galen-Barbose-11.5.15.pdf [https://perma.cc/T5YM-98UB].

373 *See* JOSEPH RAND, NICK MANDERLINK, WILL GORMAN, RYAN WISER, JOACHIM SEEL, JULIE MULVANEY KEMP, SEONGEUN JEONG & FRITZ KAHRL, LAWRENCE BERKELEY NAT'L LAB'Y, QUEUED UP: CHARACTERISTICS OF POWER PLANTS SEEKING TRANSMISSION INTERCONNECTION AS OF THE END OF 2023, at 9-24 (2024), https://emp.lbl.gov/queues [https://perma.cc/3PKZ-AH3M].

374 *Id.* at 3.

375 *See* Nadja Popovich & Brad Plumer, *Why the U.S. Electric Grid Isn't Ready for the Energy Transition*, N.Y. TIMES (June 12, 2023), https://www.nytimes.com/interactive/2023/06/12/climate/us-electric-grid-energy-transition.html [https://perma.cc/5UKR-MVJA] ("To make the plan work, the nation would need thousands of miles of new high-voltage transmission lines—large power lines that would span multiple grid regions."); CLEAN INV. MONITOR, CLEAN INVESTMENT IN 2023: ASSESSING PROGRESS IN ELECTRICITY AND TRANSPORT 6 (2024), https://cdn.prod.website-files.com/64e31ae6c5fd44b10ff405a7/65d568670df0b04daed42371_Clean%20Investment%20in%202023%20-%20Assessing%20Progress%20in%20Electricity%20and%20Transport.pdf [https://perma.cc/BM26-7B3W] (finding that investment in utility-scale clean electricity generation is lagging the pace projected by the modeling of the IRA's derisking incentives, largely due to "non-cost" barriers).

376 *See* Jeff St. John, *The US Offshore Wind Industry Faces a Moment of Reckoning*, CANARY MEDIA (Nov. 2, 2023), https://www.canarymedia.com/articles/wind/the-us-offshore-wind-industry-faces-a-moment-of-reckoning [https://perma.cc/DND3-3WF2] (discussing the "skyrocketing costs" of the offshore wind power industry).

attempt to capture emitted carbon and store it permanently underground;[377] direct air capture technologies that attempt to suck carbon directly out of the atmosphere for storage;[378] and hydrogen technologies, which might be used to power a range of industrial processes that cannot be electrified.[379] These technologies have costs that, like nuclear, run into the billions rather than millions of dollars.[380] And they remain unproven in ways that make them dangerous bets for potential investors, who to date have almost completely shied away from their pursuit.[381] There is only one case of attempted commercialization of carbon capture and storage at a power plant in the United States: the Kemper Plant in Mississippi, a state with traditional public utility regulation.[382] The script for how this project played out could be lifted nearly entirely from Part III above: it was pursued only after state legislation substantially decreased any chances of cost recovery failing, and it was

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377 *See Carbon Capture and Storage: A Low-Carbon Solution to Economy-Wide Greenhouse Gas Emissions Reductions*, AM. PETROLEUM INST., https://www.api.org/news-policy-and-issues/carbon-capture-storage [https://perma.cc/QW2C-S52A] (last visited Dec. 2, 2024) (listing numerous regulatory agencies involved in the regulation of carbon capture).

378 *See Direct Air Capture*, INT'L ENERGY AGENCY, https://www.iea.org/energy-system/carbon-capture-utilisation-and-storage/direct-air-capture [https://perma.cc/864R-6P99] (last visited Dec. 2, 2024).

379 *See* Shruti Shukla, *Hydrogen: A Targeted Decarbonization Tool but not a Panacea*, NAT'L RES. DEF. COUNCIL (Aug. 16, 2022), https://www.nrdc.org/bio/shruti-shukla/hydrogen-targeted-decarbonization-tool-not-panacea [https://perma.cc/9CQA-DEAG] (describing the risks and regulatory hurdles associated with using hydrogen as a decarbonization tool).

380 Katherine Blunt, *The Most Valuable U.S. Power Company Is Making a Huge Bet on Hydrogen*, WALL ST. J. (May 9, 2023, 5:30 AM), https://www.wsj.com/articles/the-most-valuable-u-s-power-company-is-making-a-huge-bet-on-hydrogen-4c1896d [https://perma.cc/QQB2-D4QY] ("[O]nly a fraction of hydrogen produced in the U.S. is considered green as a result of cost and technology hurdles that some energy experts say might continue to stymie the fuel's adoption even with federal support."); Stanley Reed & Ivan Penn, *Offshore Wind Runs Into Rising Costs and Delays*, N.Y. TIMES (Aug. 7, 2023), https://www.nytimes.com/2023/08/07/business/offshore-wind-costs-delays.html [https://perma.cc/5AE4-P4R7] ("The estimated price tag for [one of the world's largest offshore wind complexes] has risen to . . . about $16.6 billion . . . .").

381 *See, e.g.*, Bruce Robertson, *Carbon Capture Has a Long History. Of Failure*, INST. FOR ENERGY ECON. & FIN. ANALYSIS (Sept. 2, 2022), https://ieefa.org/resources/carbon-capture-has-long-history-failure [https://perma.cc/UJE9-DS2N] ("Close to 90 percent of the proposed global carbon capture capacity in the power sector has failed at the implementation stage or was suspended early."). Many environmentalists also balk at the amount or terms of federal money being devoted to hydrogen and carbon capture and storage. We set these important debates aside without intending to minimize them. *See Environmental Justice Equity Principles for Green Hydrogen in California*, CAL. ENV'T JUST. ALL. (Oct. 13, 2024), https://caleja.org/2023/10/environmental-justice-equity-principles-green-hydrogen-california [https://perma.cc/PX92-RC3F] (expressing concern over the "billions of dollars" California is investing in hydrogen infrastructure).

382 *See* Boyd & Carlson, *supra* note 192, at 852-53.

ultimately abandoned after cost overruns and mismanagement made it politically and economically untenable.[383]

All to say, we believe it likely that across the range of clean energy technologies that the IRA aims to promote, fiscal derisking is likely to be only the first step in attempting to design a successful regime to accomplish a clean energy transition. If this is true, then it is worth thinking through how the recent U.S. experience with nuclear power might be harnessed for derisking policy lessons, if not for much actual electricity.

We contend that southern nuclear projects illustrate the complexity of modern infrastructure development risks, which have four dimensions not captured in policies focused centrally on fiscal derisking: regulatory risk, scalar risk, temporal risk, and cultural risk. Below we connect these risks from the southern nuclear debacle to their potential manifestations in the broader project of climate derisking. Summing these parts, we discuss why a lack of central planning and control—of the sort southern states have over their electricity systems—is a core pitfall of the derisking approach to climate policy, even as such control proved complicated in the southern context.

A. *Multi-Dimensional Risks in Developing Clean Energy Infrastructure*

1. Regulatory Risk

The federal government's 2005 incentive package offered anyone willing to pursue a new nuclear power plant enticing financial benefits. Yet even with these in place, few developers moved beyond the initial planning stage with projects. Nuclear simply remained too risky. Southern utilities, however, got creative, offering their states a way out of this conundrum: new legislation that would lower the regulatory risk of public utility commissions disallowing full cost recovery on a project, *no matter what the outcome*. It was only with this legislation in place that southern utilities proceeded.

Obviously, this legislation ceded too much, particularly in terms of ratepayers assuming essentially all risk of project mismanagement. It should thus serve as a cautionary tale to states now considering how to supplementally derisk new technologies. But the nuclear industry's unbudging need for such legislation highlights more broadly the importance of considering in tandem the regulatory *and* financial risks facing new or complex technologies. Enormous regulatory risks confront many of the decarbonization technologies that IRA and IIJA target: Carbon storage raises

383 *Id.*; *see also* Kristi E. Swartz, *The Kemper Project Just Collapsed. What It Signifies for CCS*, E&E NEWS (Oct. 26, 2021, 7:11 AM), https://www.eenews.net/articles/the-kemper-project-just-collapsed-what-it-signifies-for-ccs [https://perma.cc/6UL8-TUKC] (describing project collapse).

complex questions of liability for leaks.[384] Large renewables projects face increasing local siting challenges[385] and must queue for years to hopefully be given the right to connect to the overstrained transmission grid—but at a cost unknown until an interconnection study is performed.[386] Clean hydrogen production is proceeding in the face of environmentalist pushback, evolving regulatory parameters, and uncertain product demand.[387] And presidential regime changes compound these risks: President-elect Donald Trump suggested in fall 2024 that even if the Act is not repealed, he will attempt to retract its unspent grant and loan dollars.[388]

Tensions around regulatory risks are thus mounting as the IRA and the IIJA move into the implementation phase. Already, there are signs that the laws may not alone induce a rapid enough buildout of renewable energy, transmission, or carbon capture and storage technologies, given these numerous regulatory hurdles.[389] Addressing these risks may be much harder politically than using the reconciliation process to pass a series of tax credits.

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384 Felix Mormann, Comment, *Public–Private Sharing of Carbon Sequestration Risk*, 7 NATURE SUSTAINABILITY 839, 839 (2024).

385 *See* SAMANTHA GROSS, BROOKINGS INST., RENEWABLES, LAND USE, AND LOCAL OPPOSITION IN THE UNITED STATES 1 (2020), https://www.brookings.edu/articles/renewables-land-use-and-local-opposition-in-the-united-states [https://perma.cc/V7ZQ-GS2Z] ("[I]nherent attributes of wind and solar generation make conflicts over land use and project siting more likely."). *See generally* MATTHEW EISENSON, SABIN CTR. FOR CLIMATE CHANGE LAW, OPPOSITION TO RENEWABLE ENERGY FACILITIES IN THE UNITED STATES (May 2023 ed.) (reporting that local laws that "block, delay or restrict renewable energy" are "widespread and growing").

386 *See* JOACHIM SEEL, JULIE MULVANEY KEMP, JOSEPH RAND, WILL GORMAN, DEV MILLSTEIN, FRITZ KAHRL & RYAN WISER, LAWRENCE BERKELEY NAT'L LAB'Y, GENERATOR INTERCONNECTION COSTS TO THE TRANSMISSION SYSTEM 26 (2023), https://live-lbl-eta-publications.pantheonsite.io/sites/default/files/berkeley_lab_interconnection_cost_webinar.pdf [https://perma.cc/4DRD-8RS9] (noting how interconnection costs have generally increased, are hard to collect, and require lengthy and difficulty studies to determine).

387 Jeff St. John, *Biden Admin Picks 7 'Clean Hydrogen Hubs' for $7 Billion Federal Boost*, CANARY MEDIA (Oct. 13, 2023), https://www.canarymedia.com/articles/hydrogen/biden-admin-picks-7-clean-hydrogen-hubs-for-7-billion-federal-boost [https://perma.cc/Z8MH-LDXQ] ("[T]he Biden administration has picked the parts of the country where it hopes to turn billions of dollars of federal investment into the seeds of a clean hydrogen economy . . . [b]ut many climate and environmental groups are concerned . . . ."); *see also Kathryn Krawczyk, What's Up With Hydrogen Hubs?*, ENERGY NEWS NETWORK (Oct. 23, 2024), https://energynews.us/newsletter/hydrogen-hubs-update-newsletter [https://perma.cc/L3K9-HBPA] (detailing the struggles of getting the Appalachian Regional Clean Hydrogen Hub (ARCH2) up and running, including the fact that "a third of the projects slated to be part of the ARCH2 have been canceled, and four of its development partners have left").

388 *See* Kelsey Tamborrino, *Trump Vows to Pull Back Climate Law's Unspent Dollars*, POLITICO (Sept. 5, 2024, 3:48 PM), https://www.politico.com/news/2024/09/05/trump-inflation-reduction-act-00177493 [https://perma.cc/E7CP-EGV9].

389 *See*, *e.g.*, Emma Penrod, *New York Must Triple Its Renewable Capacity in 8 Years to Meet 2030 Target: State Comptroller*, UTIL. DIVE (Aug. 2, 2023), https://www.utilitydive.com/news/new-york-renewable-capacity-goal-clean-energy-comptroller-dinapoli-report/689666

Our aim in connecting these challenges to the experience of southern nuclear is to underscore that government involvement in promoting technology frequently does not end with financial derisking. The initial catalyst of financial assistance spawns a push—and provides justification—for the creation of a whole ecosystem of additional financial and regulatory derisking measures. Yet in the nuclear renaissance context, policymakers appear to have gone in somewhat unaware of the complex set of dynamics that EPAct derisking initiatives would unleash. Although prescience is impossible, a clearer roadmap of the entirety of reforms necessary to support an emerging (or rebirthing) industry is advisable before financial derisking is put into place.

An example of how these dynamics are emerging in the clean energy transition drives home our observations. Development of offshore wind infrastructure is a major component of delivering clean energy to the densely populated East Coast.[390] The IRA provides a considerable spur for offshore wind, including it among the technologies that are eligible for generous clean electricity tax credits.[391] But even with these credits in place, offshore wind development is not proceeding evenly among states with substantial physical offshore wind potential. Instead, it is only being developed in states that have adopted additional derisking and facilitative legislation. These states include Rhode Island, New York, Massachusetts, Virginia, and New Jersey.[392] Many of these states have inked long-term contracts to purchase wind power at

[https://perma.cc/P49L-DPQ2] (discussing how New York is struggling to site and build enough renewables to meet climate goals); Carlos Anchondo, Jason Plautz & Zach Bright, *EPA Says Carbon Capture Is Within Reach. Utilities Aren't Biting.*, E&E NEWS (July 11, 2023, 6:48 AM), https://www.eenews.net/articles/epa-says-carbon-capture-is-within-reach-utilities-arent-biting [https://perma.cc/XZC2-LB8Z] (discussing how utilities are not pursuing carbon capture and storage); Herman K. Trabish, *The Meaning of an 'Optimal' Clean Energy Investment Is Changing as Prices Rise, Analysts Report*, UTIL. DIVE (July 13, 2023), https://www.utilitydive.com/news/clean-energy-investment-solar-wind-storage-rising-prices-interconnection-supply-chain-inflation/653051 [https://perma.cc/MC32-XY8N] (discussing potential complications of IRA incentives for renewables).

390 UMED PALIWAL, NIKIT ABHYANKAR, TAYLOR MCNAIR, JOSE DOMINGUEZ BENNETT, DAVID WOOLEEY, JAMIE MATOS, RIC O'CONNELL & AMOL PHADKE, GRIDLAB, GOLDMAN SCH. OF PUB. POL'Y, UNIV. OF CAL. BERKELEY, THE 2035 REPORT: ABUNDANT, AFFORDABLE OFFSHORE WIND CAN ACCELERATE OUR CLEAN ELECTRICITY FUTURE 3 (2023), https://2035report.com/offshorewind/wp-content/uploads/2023/07/GridLab_2035-Offshore-Wind-Technical-Report.pdf [https://perma.cc/63XB-2XXR].

391 *See supra* note 74.

392 *See generally* ALLEGRA DAWES & SOPHIE COSTE, CTR. FOR STRATEGIC & INT'L STUD., ALIGNING AMBITIONS: STATE STRATEGIES FOR OFFSHORE WIND (2023) (discussing the methods states including Rhode Island, New York, Massachusetts, Virginia, and New Jersey have taken to "procure and price offshore wind energy," including "power purchase agreements and offshore wind renewable energy credits").

guaranteed rates, amplifying federal derisking measures.[393] But wind developers have raised concerns about ballooning costs that have caused them to return to their state backers and ask for revised terms.[394] To be clear, these are reasonable concerns from the perspective of private developers unwilling to build these projects at a loss. But they nevertheless illustrate a familiar pattern in derisking methodologies, where private capital offloads nearly all project risk onto state partners and only proceeds once assured of attractive financial gains.[395]

In 2024, New York and Massachusetts rejected requests for contract cost increases (in notable contrast to southern nuclear states' proclivities), but then reopened bidding on wind projects to allow for higher negotiated prices.[396] New Jersey faced a similar conundrum, with its clean energy goals

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393 Will Wade, *New York Awards Contracts for Three Offshore Wind Projects*, BLOOMBERG (Oct. 24, 2023, 12:37 PM), https://www.bloomberg.com/news/articles/2023-10-24/new-york-awards-contracts-for-three-offshore-wind-projects [https://perma.cc/U4CA-QLVH] (discussing New York's efforts to negotiate contracts for its offshore wind farms); SAMUEL BEIRNE, MD. ENERGY ADMIN., MARYLAND OFFSHORE WIND OVERVIEW: BOEM VIRTUAL SCOPING MEETINGS FOR US WIND CONSTRUCTION AND OPERATIONS PLAN 5-7 (2022), https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Maryland%20Offshore%20Wind%20Overview_MEA%20Presentation.pdf [https://perma.cc/CX2Z-ZXFP] (providing levelized prices for Maryland's Offshore Wind Renewable Energy Credit (OREC) Program).

394 *See* Lee Harris, *After Securing State Contracts, Wind Developers Demand Subsidies and Higher Rates*, THE AM. PROSPECT (July 25, 2023), https://prospect.org/environment/2023-07-25-wind-developers-demand-subsidies-higher-rates [https://perma.cc/QMU5-XQEP] ("Offshore wind companies along the East Coast are seeking to re-trade deals with state governments, arguing that projects that they previously committed to will fold without additional support.").

395 *See* GABOR, *supra* note 6, at 22-24 ("[E]ven at its most ambitiously transformative, derisking outsources the pace of decarbonisation to private capital, and in so doing, can amplify its disorderly expansion guided by shifting profit opportunities."); Christophers, *supra* note 31, at 58 ("[I]nsofar as the private sector is ruled by the profit imperative, profitability . . . utterly dominates renewably energy's conditions of both possibility and performance.").

396 Eduardo Garcia, *New York Auction Highlights Jump in US Offshore Wind Prices*, REUTERS (Mar. 14, 2024, 12:14 PM), https://www.reuters.com/business/energy/new-york-auction-highlights-jump-us-offshore-wind-prices-2024-03-14 [https://perma.cc/V8RW-LYVD] (discussing how New York turned to an expedited project solicitation after inflation and rising interest rates made the original project agreements uneconomical); Ethan Howland, *As Ørsted, Others Seek Up to 71% Hike in Clean Energy Contract Prices, NYSERDA Warns of Rate Increases*, UTIL. DIVE (Aug. 31, 2023), https://www.utilitydive.com/news/new-york-clean-energy-contracts-change-prices-orsted-equinor-nyserda-psc/692415 [https://perma.cc/EU3G-YJMC] ("Clean energy developers have been asking utility regulators across the U.S. to provide relief from inflation including in California, Connecticut, Hawaii, Indiana, Maine, Maryland, Massachusetts, Michigan, New Jersey, New Mexico and Rhode Island . . . ."); Colin Young, *State Refuses to Renegotiate Offshore Wind Energy Agreements, Gives Developers a Mid-Week Deadline*, WBUR (Nov. 7, 2022), https://www.wbur.org/news/2022/11/07/state-refuses-to-renegotiate-offshore-wind-energy-agreements-gives-developers-a-mid-week-deadline [https://perma.cc/W3EG-23ZZ] ("Commonwealth Wind said . . . that price increases, supply shortages and interest rate hikes have changed the project's economics so much since the developer and utilities agreed to long-term contracts . . . that it might not be able to secure the upfront financing necessary to actually build the project at all."); Marie J. French, *New York Rejects Offshore Wind, Onshore Renewables Request for Larger*

threatened by the wind developer Ørsted's November 2023 decision to abandon its significant projects due to cost increases.[397] The state later amended its contracting strategy to include an "inflation adjustment, which can rise or fall by as much as 15 percent depending on construction or financing costs."[398] Only Virginia—a state in which a vertically integrated, regulated utility is leading development—avoided these setbacks and delays in its offshore wind development.[399]

More broadly, it appears that in offshore wind, as was the case with nuclear, federal financial derisking is both necessary and insufficient to induce a clean energy buildout. States intent on pursuing offshore wind are having to construct an accretive regulatory regime to induce private developers to build.[400] To be sure, the policy strategy of these northeastern states is quite different than the one pursued by southern nuclear states. But the broader point adheres: fiscal derisking is only a first step toward complex project buildout, and what gets layered on top of it matters considerably for the pace, scale, and distributional consequences of the clean energy transition. Understanding the multifaceted state and federal regulatory regimes necessary to bring fiscal derisking to fruition for various clean energy technologies is critical to ensuring their success.

2. Scalar Risk

The discrepancy between outcomes in South Carolina's abandoned nuclear project and Georgia's completed project cannot be boiled down to a single factor. But one important difference between the two states is scale.

Subsidies, POLITICO (Oct. 12, 2023, 1:02 PM), https://www.politico.com/news/2023/10/12/new-york-rejects-offshore-wind-onshore-renewable-request-for-bigger-payments-00121231 [https://perma.cc/8ZRD-8THL] (noting that New York "rejected a request from companies for bigger payments to complete large-scale wind, solar and offshore wind projects––leaving the developments in doubt and threatening New York's ability to meet its climate goals").

397 Jillian Ambrose, *Ørsted Cancels Two US Offshore Windfarm Projects at £3.3bn Cost*, THE GUARDIAN (Nov. 1, 2023, 9:30 PM), https://www.theguardian.com/environment/2023/nov/01/rsted-cancels-two-us-offshore-windfarm-projects-at-33bn-cost [https://perma.cc/GE6M-7UYD].

398 Benjamin Storrow, *NJ Hits Reset on Offshore Wind, Approves Two Massive Projects*, E&E NEWS (Jan. 25, 2024, 6:22 AM), https://www.eenews.net/articles/nj-hits-reset-on-offshore-wind-approves-two-massive-projects [https://perma.cc/LD56-RR2J].

399 Emma Penrod, *BOEM Approves 2.6-GW Dominion Energy Offshore Wind Farm, Largest Yet in US*, UTIL. DIVE (Nov. 1, 2023), https://www.utilitydive.com/news/boem-dominion-energy-offshore-wind-farm-virginia/698413 [https://perma.cc/A3F9-MSHN].

400 Plus, we haven't even mentioned the additional efforts these states are making to construct the transmission infrastructure needed for offshore wind! *See, e.g.*, Tom Johnson, *NJ Looks to Advance Efforts to Build Offshore Wind Transmission*, N.J. SPOTLIGHT NEWS (Apr. 5, 2024), https://www.njspotlightnews.org/2024/04/nj-looks-to-advance-efforts-to-build-offshore-wind-transmission [https://perma.cc/3FHZ-WL3H] (describing New Jersey's efforts to construct ten to twelve miles of underground connective "pre-build infrastructure" for an undisclosed cost).

South Carolina, as a small poor state, simply could not absorb the costs necessary to bring nuclear power over the finish line. Ultimately, South Carolina ratepayers lost out considerably from being an early mover on reviving nuclear energy—at one point paying up to twenty-seven dollars extra a month for the two holes left in the ground by the failed V.C. Summer nuclear construction project.[401] These additional costs caused South Carolina's electricity bills to rank as *the highest in the nation* in 2018.[402] As of October 2024, it has since returned to rank within the bottom half of states in terms of overall bills,[403] but crushing statistics on energy poverty remain, as some counties report energy burdens for low and moderate-income residents as high as twenty-four percent.[404] One way to understand what occurred in South Carolina is this: the majority of the country outsourced most of the risks associated with attempting new nuclear development—an aim deemed to be a worthy federal goal—to a small, poor subset of the national population. If it had succeeded, the entire country would have reaped the benefits in the form of nuclear development capacity enhancement; when it failed, South Carolina ratepayers and its utility shouldered the costs.

The lessons to draw from South Carolina's struggles sound in both equity and federalism. On the equity front: to the extent that derisking initiatives depend upon a partnership model wherein risk is not completely federalized, but instead is split with other parties, significant questions of fairness and feasibility arise. Going forward, more scrutiny should be given to where and how project developers find pathways to mitigate remaining risk. These challenges are particularly acute when *utilities* are parties in developing a new technology, as state ratepayers functionally shoulder the remaining burden of project risk that is not mitigated by federal incentives. It is for this reason that the vice chair of GA PSC has proclaimed that to approve more nuclear, he would "need a federal financial backstop that would cover ninety percent of the cost overruns over a contracted price to build another reactor."[405]

On the federalism front: project costs should not be concentrated in small or less wealthy states. There is significant risk in being the first mover in new generation technologies. Spreading project risk over larger populations is both fairer and more likely to result in project completion in the case of cost

401 Sammy Fretwell, *SC Residents Pay Nation's Highest Electricity Bills, Report Says*, GREENVILLE NEWS (Feb. 20, 2018, 11:05 AM), https://www.greenvilleonline.com/story/news/2018/02/20/sc-residents-pay-nations-highest-electricity-bills-report-says/354524002 [https://perma.cc/RYY7-QFV4].

402 *Id.*

403 Save On Energy Team, *Electricity Bill Report: October 2024*, SAVE ON ENERGY (Oct. 1, 2024), https://perma.cc/SE8G-DQTF.

404 *Environmental Justice*, S.C. ENERGY OFF., https://energy.sc.gov/focus-area/environmental-justice [https://perma.cc/7TT4-L7DL] (last visited Oct. 16, 2024).

405 Bright, *supra* note 362.

overruns. Small and less affluent states may also be more susceptible to legislative and commission capture on issues related to energy—a point we probe further below.

The differences emerging between technologies incentivized by the IRA's derisking strategy and the IIJA's grant-based strategy illustrate a burgeoning awareness of these challenges. Whereas the IRA's tax credits are pure fiscal derisking, the IIJA includes what Gabor calls "soft conditionality" requirements.[406] For example, the Act provides eight billion dollars to the Department of Energy to fund a Regional Clean Hydrogen Hubs Program.[407] It further specifies that "[t]o the maximum extent practicable, each regional clean hydrogen hub . . . shall be located in a different region of the United States . . . ."[408] The Department announced its selection of seven such hubs in October 2023[409] after evaluating applications on, among other factors, technical merit and impact, financial and market viability, project partners, and community benefits plans.[410] This grant-based legislative design allows the Department more control over the trajectory of the industry than the IRA's fiscal derisking strategy—although, as Gabor notes, such conditionalities can "easily be subsequently diluted."[411]

An intriguing possibility for financing new nuclear construction that shifts these equity considerations comes from potential alliances between data centers and nuclear developers. U.S. Energy Secretary Jennifer Granholm has called for big technology companies to invest in SMRs as a way to cover their surging demand.[412] In late 2024, both Google and Amazon announced

406 *See supra* Table 1 (illustrating the spectrum of government control from ownership to pure fiscal derisking); GABOR, *supra* note 6, at 4 (identifying approaches to soft conditionality "such as initial eligibility criteria, local content requirements, or output-based performance targets in Public Private Partnerships that can easily be subsequently diluted").

407 *Regional Clean Hydrogen Hubs*, U.S. DEP'T OF ENERGY, https://www.energy.gov/oced/regional-clean-hydrogen-hubs [https://perma.cc/C4P7-Q9Q5] (last visited Feb. 9, 2024). The Act provides similar mechanisms for four direct air capture hubs. *Regional Direct Air Capture Hubs*, U.S. DEP'T OF ENERGY, https://www.energy.gov/oced/DACHubs [https://perma.cc/9V5H-3CX2] (last visited Feb. 9, 2024).

408 Infrastructure Investment and Jobs Act, Pub. L. No. 117-58, § 813(c)(3)(C)(ii), 135 Stat. 429, 1009 (2021) (to be codified at 42 U.S.C. § 16161a).

409 Press Release, U.S. Dep't of Energy, Biden-Harris Administration Announces $7 Billion For America's First Clean Hydrogen Hubs, Driving Clean Manufacturing and Delivering New Economic Opportunities Nationwide (Oct. 13, 2024), https://www.energy.gov/articles/biden-harris-administration-announces-7-billion-americas-first-clean-hydrogen-hubs-driving [https://perma.cc/93WJ-JB2V].

410 *Regional Clean Hydrogen Hubs Selections for Award Negotiations*, U.S. DEP'T OF ENERGY, https://www.energy.gov/oced/regional-clean-hydrogen-hubs-selections-award-negotiations [https://perma.cc/G2E9-K4F7] (last visited Nov. 23, 2024).

411 GABOR, *supra* note 6, at 4.

412 Timothy Gardner, Valerie Volcovici & Leah Douglas, *Power-Hungry Data Centers Spur U.S. Talks with Big Tech, Energy Chief Granholm Says*, REUTERS (June 5, 2024, 12:03 PM),

tentative deals with SMR developers precisely along these lines.[413] Having these companies, rather than utilities with ratepayers, bear the risk of SMR cost overruns arguably proves a more equitable way to fund this experimental technology, as it spreads the risks and costs of these technologies across all shareholders and users of Amazon and Google services.[414] But whether these plans will have more success in coming to fruition—and how many such companies are willing to bear this risk—remain open questions.[415]

Indeed, most developers appear to be hoping that consumers will again bear the risks of SMR construction—but potential purchasers remain wary. NuScale Power, the only U.S. company with an NRC-approved small modular reactor design, cancelled its plans to build the first commercial plant in November 2023.[416] The project was backed by a $1.4 billion cost-share deal from the Department of Energy[417] but could cajole only a handful of western municipalities to subscribe as purchasers.[418] Meanwhile, private equity and asset management firms, which invest predominantly in deregulated

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https://www.reuters.com/technology/power-hungry-data-centers-spur-us-talks-with-big-tech-energy-chief-granholm-says-2024-06-04 [https://perma.cc/CK72-6GYV].

413 *See* Eric Wesoff, *Google Signs Deal to Use Small Nuclear Reactors to Power Data Centers*, CANARY MEDIA (Oct. 14, 2024), https://www.canarymedia.com/articles/nuclear/google-agrees-to-multi-reactor-power-deal-with-nuclear-startup-kairos [https://perma.cc/K3FS-X948]; Brian Martucci, *Amazon Announces Small Modular Reactor Deals with Dominion, X-Energy, Energy Northwest*, UTIL. DIVE (Oct. 16, 2024), https://www.utilitydive.com/news/amazon-small-modular-reactor-deals-nuclear-dominion-x-energy-energy-northwest/730022 [https://perma.cc/4MFH-WBDS].

414 Presumably, costs would be passed on to all consumers of big technology, proportional to their usage—spreading the costs widely and pegging them somewhat to cost-causation principles.

415 Some tech companies have expressed reluctance about playing this role: In late 2023, technology companies delivered a message at the American Nuclear Society's annual conference that although they were interested in utilizing nuclear power, "they're poorly positioned to help develop new reactors" and are not the right parties to shoulder the risk. Will Wade, *Big Tech Wants Nuclear Power but Doesn't See Role as Investor*, BLOOMBERG (June 17, 2024, 4:16 PM), https://www.bloomberg.com/news/articles/2024-06-17/big-tech-wants-nuclear-power-but-doesn-t-see-role-as-investor [https://perma.cc/G383-YCNY].

416 Zach Bright, *NuScale Cancels First-of-a-Kind Nuclear Project as Costs Surge*, E&E NEWS (Nov. 9, 2023), https://www.eenews.net/articles/nuscale-cancels-first-of-a-kind-nuclear-project-as-costs-surge [https://perma.cc/5FKN-QT3M].

417 *Id.*

418 The project had power purchase agreements with a consortium of thirty-five municipalities but no privately owned utilities. *See id.*; *see also, e.g.*, UTAH ASSOCIATED MUN. POWER SYS., 2019 ANNUAL REPORT 12 (2019), https://www.uamps.com/file/c259eb4e-0172-4533-81ef-a2c6043ed268 [https://perma.cc/NSE6-BDGK] (detailing UAMPS's partnership with NuScale). Initially projected to sell power at $55/MWh, the target price jumped to $89/MWh by early 2023 (even after factoring in the new $30/MWh subsidy available from the IRA). *See* Bright, *supra* note 416; David Schlissel, *Eye-Popping New Cost Estimates Released for NuScale Small Modular Reactor*, INST. FOR ENERGY ECON. FIN. ANALYSIS (Jan. 11, 2023), https://ieefa.org/resources/eye-popping-new-cost-estimates-released-nuscale-small-modular-reactor [https://perma.cc/KTR7-DRDZ].

wholesale markets, have expressed reluctance about being early investors in advanced nuclear.[419]

As of 2024, the only SMR (or nuclear plant generally) under construction in the United States was a demonstration plant in Wyoming financed predominantly by billionaire Bill Gates's company, TerraPower.[420] Backed by a DOE loan, the reactor is scheduled to be operational in 2030, although it is still awaiting NRC approval of its design.[421] The largely private nature of TerraPower's funding marks, in our view, an equitable improvement over utility-financed development of this particularly risky, experimental technology—although its founder's unique commitment to the technology may not make it a replicable model.[422]

3. Temporal Risk

Financial derisking as a climate mitigation strategy "reifies the functionality of the price mechanism," in the words of Gabor.[423] That is to say, the success of financial derisking is predicated on the government's boost of funding working as a catalyst that makes the targeted clean energy source cheaper than its carbon-emitting equivalent. What gets built in this scenario is always a comparative exercise that turns on the next best option under varying market conditions.

In the case of southern nuclear, we have traced how regulators and legislators turned toward it in the mid-aughts to hedge against high gas prices and anticipated federal climate regulations.[424] Under these conditions, nuclear's prospects looked strong enough that the offered federal financial derisking incentives induced southern state and utility action. Yet as projects unfolded at the slow, creeping pace inevitable for large complex

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419 *See, e.g.*, Hawker, *supra* note 370.

420 *Wyoming*, TERRAPOWER, https://www.terrapower.com/wyoming [https://perma.cc/T9TT-QQN8] (last visited Aug. 21, 2024); *Grid Talk: TerraPower Aims to Trigger U.S. Nuclear Rebirth*, OFF. OF ELEC., U.S. DEP'T OF ENERGY (Aug. 1, 2024), https://www.energy.gov/electricity-insights/articles/grid-talk-terrapower-aims-trigger-us-nuclear-rebirth [https://perma.cc/LN7C-KX93].

421 *See* Interview Transcript by Marty Rosenberg with Chris Levesque, CEO, TerraPower (Aug. 1, 2024), at 2, https://www.energy.gov/sites/default/files/2024-08/01-08-2024-doe-grid-talk-420-levesque-transcript-508.pdf [https://perma.cc/JBB6-B9AL]; *see also NRC Accepts TerraPower's SMR Construction Permit*, NUCLEAR NEWSWIRE (May 24, 2024, 1:00 PM), https://www.ans.org/news/article-6073/nrc-accepts-terrapowers-smr-construction-permit [https://perma.cc/KK9N-77L5].

422 *See* Caleb Muta, *Bill Gates Says He's Ready to Put Billions into Nuclear Power*, BLOOMBERG (June 16, 2024, 1:54 PM), https://www.bloomberg.com/news/articles/2024-06-16/bill-gates-says-he-s-ready-to-put-billions-into-nuclear-power [https://perma.cc/JA7G-LSBX] (describing Bill Gates as "prepared to plow billions of dollars into" the Wyoming project).

423 GABOR, *supra* note 6, at 4.

424 *See supra* Part III.

infrastructure, conditions changed. In the wake of failed efforts to regulate climate change and a fracking-induced natural gas glut, nuclear power no longer looked better than natural gas generation. And so, South Carolina, Florida, and North Carolina logically walked away after hundreds of millions to billions were spent.

The southern experience with nuclear underscores a gaping temporal risk with derisking measures as a strategy for climate mitigation. Oil and natural gas are known for their volatile pricing (even as this pricing is undergirded by many subsidies that have flowed their way over the past century and beyond).[425] Almost nothing in the IIJA or IRA makes this pricing predictably and steadily higher to reflect societal costs—as would, for example, a carbon tax or some other tangible disincentive on fossil fuel production.[426] These laws rest, instead, on an abiding (but perhaps misguided[427]) faith that clean energy will—with just a little financial help—be able to outcompete fossil fuels on economic terms alone over the next decade.

The South's nuclear experience suggests that relying on this head-to-head competition over time may be a risky bet, as it forces clean energy infrastructure projects to outshine fossil fuel alternatives through years of changing geopolitics and economic outlooks. For onshore wind and solar, this risk seems less acute: in recent years, the levelized costs of energy from solar and wind have plummeted to levels well below natural gas and coal, even without subsidies.[428] These investments are often described as a "no-regrets" strategy given their relatively simple technologies, low costs, and limited negative social impacts.[429] Yet renewable energy is not coming online in

425 *See* Kenneth Rogoff, *Global Oil and Gas Prices Have Been Highly Volatile—What Will Happen Next?*, GUARDIAN (July 5, 2022, 2:20 PM), https://www.theguardian.com/business/2022/jul/05/global-oil-gas-prices-supply-demand-us-europe [https://perma.cc/CEN4-NL74] (discussing recent price instability in the oil and gas market). *See generally* Comment, *The Depletion Deduction in the Oil and Gas Industry for Federal Income Tax Purposes*, 3 DEPAUL L. REV. 233 (1954) (discussing the expansion of preferential tax treatment for oil and gas production in the early-twentieth century).

426 *See* Amarnath et al., *supra* note 92 ("Derisking is not consistent with discipline. This is the difference between derisking and earlier experiments with industrial policy.").

427 *See supra* note 31 and accompanying text.

428 *See* LAZARD, LAZARD'S LEVELIZED COST OF ENERGY ANALYSIS—VERSION 16.0 9 (2023), https://www.lazard.com/media/2ozoovyg/lazards-lcoeplus-april-2023.pdf [https://perma.cc/YXE4-PGCC] (calculating the levelized cost of energy at $50 for onshore wind, $60 for utility-scale solar PV, $70 for combined-cycle gas, and $117 for coal).

429 *See, e.g.*, *LA100: The Los Angeles 100% Renewable Energy Study and Equity Strategies*, NAT'L RENEWABLE ENERGY LAB'Y, https://maps.nrel.gov/la100/la100-study/topics/high-level-findings#la-can-get-started-now-no-regrets-options [https://perma.cc/C4SH-43LZ] (last visited Feb. 9, 2024) (analyzing decarbonization options for Los Angeles and finding that "new wind, solar, batteries, and transmission" were all "no-regrets" strategies); *see also* Walters, *supra* note 33, at 23 ("Industrial policy works well when preferred sectors are on the verge of displacing unpreferred sectors"). *But see* CHRISTOPHERS, *supra* note 31, at 180-84 (pointing out that costs are not what

market regions fast enough. And notably, much of the new generation that is being added is not sold on a competitive basis at all. Rather, a substantial portion of renewable energy is sold via long-term contracts that link buyers and sellers outside of the markets, which provides the price stability wind and solar developers need to obtain financing to develop new projects.[430] Again, these trends indicate the need for price stabilization beyond derisking—a need that is even more acute for less-proven technologies teetering at the brink of commercialization. Ultimately, the instability created by a failure to price carbon or otherwise discipline fossil fuel investments may be a death knell down the road.[431] Indeed, offshore wind's collapse in the face of changing supply chain costs is a perfect illustration of the temporal risks of a derisking approach.

Thus, both the southern nuclear experience and recent experiments in offshore wind provide unfortunate confirmation of a theory advanced by Gabor and others: policies that actively constrain unabated fossil fuels and thus drive their prices predictably higher may be critical additions to ensuring climate derisking initiatives' success over time.[432] Without such constraints, and as the nuclear experience teaches us all too well, clean energy investors will logically require greater state assumption of price fluctuation risks to proceed.

4. Cultural Risk

The legal shape that derisking takes creates its own political culture. In the case of nuclear power, federal incentives helped propel a narrative that nuclear power was a viable climate change strategy. That piqued southern politicians' interests, intent as they were on finding a palatable way to manage expected climate change regulation. Vertically integrated utilities got excited about the potential for significant rate-based capital expenditures under a nuclear renaissance. But southern states did not house the only vertically

matter in this context, but rather *profit-making* potential, and arguing that renewable energy remains less profitable than fossil fuels absent governmental interventions or contractual terms that provide substantial price stability).

430 CHRISTOPHERS, *supra* note 31, at 184-85.

431 *Cf.* Katie Kedward, Daniela Gabor & Josh Ryan-Collins, *Aligning Finance with the Green Transition: From a Risk-Based to an Allocative Green Credit Policy Regime* 9 (UCL Inst. for Innovation & Pub. Purpose, Working Paper No. 2022-11, 2022), https://www.ucl.ac.uk/bartlett/public-purpose/sites/bartlett_public_purpose/files/kedward_gabor_ryan-collins_aligning_finance_with_the_green_transition_from_a_risk-based_to_allocative_green_credit_policy_regime.pdf [https://perma.cc/8LPS-2QWY] (arguing that derisking strategies neglect "the dynamics of market-based finance, where opportunities for arbitrage and regulatory circumvention will undermine the efficacy of relative price adjustments").

432 *See* GABOR, *supra* note 6, at 6 (noting that derisking measures provide "limited scope for disciplining (carbon) capital").

integrated utilities—they just housed the only ones able to marshal state politics to support new nuclear. Leveraging federal incentives, southern utilities persuaded their legislatures to rush through new laws that substantially mitigated any remaining utility risk related to the costs of delayed or abandoned nuclear reactors.

From there, state outcomes diverged: North Carolina and Florida remained circumspect about nuclear power, allowing their utilities only some tentative forays using ratepayer money. In Georgia and South Carolina, however, there was a snowballing effect: a rush to secure federal money led to inadequately vetted legislation and plans. Poor planning begot construction delays and cost overruns. Insufficient legal incentives for utilities to control costs led to inadequate supervision of these cost overruns. And so, utilities returned time and again to their commissions to ask for permission to spend more money.

Why did these two commissions continue to say yes, over and over, to raising rates on ratepayers to continue to fund nuclear construction? The legal structure of derisking legislation was a contributing factor, especially in South Carolina, where the law explicitly instructed commissioners *never* to reconsider the wisdom of the nuclear project as a whole when making additional rate-increase determinations. Utilities won such strongly insulating legislation by leveraging regulatory culture, drawing on both their reputational and financial strength in the states.[433] Legislators were politically indebted to utilities, trusted them, and had little technical knowledge of the electricity system. Commissioners—elected in Georgia and appointed in South Carolina—were not equipped to second-guess utility decisions, either in terms of personnel or commissioner background and training.[434] What's more, commissioners, legislators, and utility executives frequented the same nightclubs and restaurants, and played in the same bands.[435]

This portrait suggests a systemic problem of utility capture across southern energy institutions. But the story is more nuanced than the classic version of capture, in which regulators act against the public interest to forward industry's agenda for their related personal gains.[436] Legislators and regulators in the region genuinely believed they were taking proactive steps

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433 *See* Conor Harrison & Shelley Welton, *The States That Opted Out: Politics, Power, and Exceptionalism in the Quest for Electricity Deregulation in the United States South*, 79 ENERGY RSCH. & SOC. SCI. 102147, at 8 (2021) (noting utilities' "pervasive" influence on regulators).

434 Commission election versus appointment played no large role in our comparison study, though many assume that it would influence commission dynamics. *See, e.g.*, Timothy Besley & Stephen Coate, *Elected Versus Appointed Regulators: Theory and Evidence*, 1 J. EUR. ECON. ASS'N 1176, 1184, 1196 (2003) (finding greater consumer protection in states with elected commissions).

435 *See* Harrison & Welton, *supra* note 433, at 8.

436 *See* George J. Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON. & MGMT. SCI. 3, 3-5 (1971) (explaining industry capture).

for their states and their nation in embracing nuclear power—a belief enhanced by federal derisking legislation. Georgia's and South Carolina's dogged, ill-advised pursuits of the technology in the face of numerous setbacks is perhaps better situated as "cultural" capture, in the terminology of James Kwak.[437] As nuclear power's development hit glitches, relationships fueled a problematic groupthink among regulators and utility executives. Consumer advocates had limited or conflicted roles that created only weak voices against continuing construction. Once interest groups began paying attention and challenged rate hikes, it was too late, especially given the ways that state legislation had entrenched a bias against regulatory second-guessing. And even once it was apparent that walking away from these projects made sense from an economic perspective, it remained deeply politically unappealing for utilities, commissions, and legislatures that had very publicly staked their bets on nuclear.

As this recounting illustrates, derisking both intervenes within and entrenches a political culture, not just a system of financial interactions.[438] Attention to this cultural dimension of derisking raises numerous questions for the attempts at climate derisking beginning to unfold under limited federal control: who is pursuing these projects, and who is declining them? Under what types of coalitions and background political conditions? Under what types of legal arrangements? Earlier attention to these details might help avert drawn-out, expensive, misguided forays into clean energy experiments that do their host locales more harm than good.

B. *Getting the Job Done: Derisking and Public Utility Law*

We are among many that believe that southern investments into nuclear power were a mistake. Even in Georgia, where at least there are reactors to show for all the trouble, the money could have been better spent on a panoply of other clean energy technologies. Yet we believe there is a final underappreciated and somewhat perverse lesson to draw from southern states' experiences: these states were able to pursue big, risky new

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437 *See* James Kwak, *Cultural Capture and the Financial Crisis*, *in* PREVENTING REGULATORY CAPTURE: SPECIAL INTEREST INFLUENCE AND HOW TO LIMIT IT 76-80 (Daniel Carpenter & David A. Moss eds., 2013) (distinguishing a version of capture based solely in "material self-interest" from versions that focus on the structural shape of regulatory-industry interactions).

438 *Cf.* LEAH CARDAMORE STOKES, SHORT CIRCUITING POLICY: INTEREST GROUPS AND THE BATTLE OVER CLEAN ENERGY AND CLIMATE POLICY IN THE AMERICAN STATES 3 (2020) (elucidating this "policy feedback" phenomenon in clean energy policy); Eric Biber, *Cultivating a Green Political Landscape: Lessons for Climate Change Policy from the Defeat of California's Proposition 23*, 66 VAND. L. REV. 399, 401-02 (2013) ("[T]he most important feature of any effort to address climate change [may be whether] it will create political momentum for future steps.").

infrastructure projects only because of the tight and broad regulatory control over their energy systems afforded by public utility law.

Electricity is multiple things: it is an energy form, but it is also "an investment opportunity, a climate change mitigation strategy, an employment prospect, a component of economic development, and a site of democratic, community organizing."[439] Wholesale electricity markets tend to prioritize one of those things—the investment opportunity. In contrast, southern states considering nuclear power did so in the context of state legal control over what sources of energy would power their systems going forward, along with a mechanism for paying for their preferred choices: rate recovery of utility costs. This system allowed these states to be forward-looking about the range of values that mattered in planning their systems, including mitigating climate change (or at least the risk of climate regulation), providing long-lasting steady power for their grandchildren, and creating good in-state jobs.[440]

Once these states chose to pursue nuclear, they were able to manage nuclear construction as part of a *system* of investments into infrastructure. Florida and North Carolina soon walked away, determining ratepayer money was better spent elsewhere. South Carolina went foolishly far down the road before reaching the same conclusion. Georgia, for its part, never would have been able to continue building Vogtle to the bitter end without tight state control. In a market system, the project would have simply been undercut by sinking natural gas prices, thus falling prey to the temporal risks of large infrastructure building.

The point we want to emphasize is not about the wisdom of these states' decisions, but about their ability to make these decisions in the first place. In the nuclear experiments, public control over infrastructure planning and execution was central to allowing these states to manage the future of their energy systems.[441] Southern states had this control only because they maintained a robust form of public utility law.[442] Public utility regulation—through its commission-oversight structure, long-term planning requirements, and emphasis on "just and reasonable rates"—at least attempts to center long-term public goals for the electricity system, as opposed to capital accumulation.[443]

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439 Luke & Huber, *supra* note 36, at 1699.

440 *See supra* Part III.

441 *Cf.* Boyd, *supra* note 12, at 1698 ("In short, planning has been and will continue to be central to the organization and management of the electric power system.").

442 For a conceptual overview of public utility law, see *supra* Part I.

443 *See* Boyd, *supra* note 12, at 1619, 1695 (extolling the benefits of public utility planning to guide utility investments under "a broader set of considerations"); NOVAK, *supra* note 12, at 109

Given the pathologies that attended public utility regulation in recent attempts at nuclear building, we do not advocate leaning into this same strategy again without substantial capacity and governance reforms in state legislatures and commissions.[444] Similarly, reform of utilities' internal corporate governance might be a fruitful, complementary avenue.[445] More broadly, the lesson to draw from the south's nuclear derisking experiments is the pressing imperative to build *better* models of public control.[446] There is mounting evidence that more coordination and ability to direct and manage clean energy infrastructure buildout may be a central element of a successful transition. The Biden Administration's goal for a 100% decarbonized electricity system by 2035 rests on *massive and rapid* electricity infrastructure transformation and growth, the scale of which has not been achieved since at least rural electrification.[447] As Melanie Brusseler has argued, a transition on this scale will require that "investment and divestment . . . be undertaken rapidly, often out of sync with existing capital depreciation and expenditure cycles, and without primary concern for private profitability."[448]

The compromise struck in the IRA does nothing to provide this sort of coordination over clean energy infrastructure's development.[449] IRA derisking is an atomizing strategy: incentives are floated in the hope that they will help create favorable conditions for private-sector-led technological

(tracing how policy makers historically "pioneered a more capacious notion of 'public interest' in politics and economics" through "the public utility idea").

444 On potential reforms, see generally Welton, *supra* note 116, at 264-74; Boyd, *supra* note 12, at 1682-708; Heather Payne, *Private (Utility) Regulators*, 50 ENV'T L. 999, 1039-49 (2021); Joel B. Eisen & Heather Payne, *Utilities With Purpose*, 76 FLA. L. REV. 987, 1047-71 (2024).

445 *See* Kovvali & Macey, *supra* note 12, at 600-11 (proposing a new model of corporate governance for utilities); Kovvali & Macey, *supra* note 357 (manuscript at 54-69) (arguing that the government needs more controls over corporate governance when it can plausibly contract with only one firm).

446 *See* William Boyd, *Decomodifying Electricity*, 97 S. CAL. L. REV. 937, 946-48 (2024) (critiquing contemporary electricity markets as unsuited for the shift to renewable energy).

447 *See supra* Part I (describing the magnitude of the effort to decarbonize American infrastructure).

448 Melanie Brusseler, *Transitioning Systems? On Coordinating the Green Transition*, COMMON WEALTH (May 18, 2023), https://www.common-wealth.co.uk/perspectives/transitioning-systems-coordinating-the-green-transition [https://perma.cc/632Z-3ALH]; *see also Zachary D. Liscow*, *Getting Infrastructure Built: The Law and Economics of Permitting* (Mar. 28, 2024) (manuscript at 25), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4775481 [https://perma.cc/7NWM-YD76] (emphasizing the importance of "executive planning capacity" for getting infrastructure built).

449 *Cf.* Rodrik, *supra* note 33, at 472-73, 483-84 (arguing that coordination and learning-by-doing are central elements of successful green industrial policy); Kedward et al., *supra* note 431, at 4-7 (arguing that derisking approaches falter in part because they do not "overtly seek to target sector-specific prices or quantities of capital in alignment with a particular decarbonization pathway").

development, come where it may.[450] Moreover, this strategy leaves to private whims additional goals for the electricity sector, which provides a good that is also "a basic need for a healthy and dignified life."[451]

From a short-term economic perspective, these results may be salutary: government incentives will only spur projects that can *almost* stand on two feet in the marketplace, but for the need of a small financial boost. But in terms of inducing innovation toward rapid and deep decarbonization, years could be lost to a market-forward experiment that may not adequately drive climate solutions at scale. Given the regulatory risks, long timetables, and numerous uncertainties, there are already signs that the IIJA and IRA may not be sufficient to induce a rapid enough buildout of renewable energy, transmission, or carbon capture and storage technologies.[452] Nor is it obvious that investments in these various technologies will be adequately coordinated to complement each other in ways necessary to ensure grid reliability, affordability, or democratic acceptance of the clean energy transition.[453] After all, merchant generators and their backers operating in wholesale markets are just that—generators in search of profits with little concern for anything else.[454]

Going forward, the technologies that climate derisking legislation seeks to promote will likely need more government support to reach fruition. What gets layered on top of these statutes will determine who benefits from the clean energy transition and who pays for it. This point is crucial. One compelling critique leveled at the fiscal derisking model of infrastructure development is that it outsources all the gains of clean energy while insourcing (i.e., keeping with the public) all the risks.[455] As William Boyd traces, this model creates a substantial likelihood that enormous amounts of

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450 *See* GABOR, *supra* note 6, at 23 ("[E]ven at its most ambitiously transformative, derisking outsources the pace of decarbonisation to private capital, and in so doing, can amplify its disorderly expansion guided by shifting profit opportunities.").

451 Luke & Huber, *supra* note 36, at 1701.

452 *See* sources cited *supra* note 389 (detailing the structural obstacles slowing the widespread adoption of green energy technologies).

453 *Cf.* Jenkins et al., *supra* note 1, at 2506 (arguing that deep decarbonization, with its long planning horizons, cannot be achieved by "muddling through"); Alexander C. Kaufman, *States Will Decide How Much Democrats' Historic Climate Deal Actually Cuts Emissions*, HUFFPOST (Aug. 13, 2022, 8:00 AM), https://www.huffpost.com/entry/ira-climate-states_n_62f54317e4b045e6f6abb444 [https://perma.cc/E3RW-HSSB] ("[F]ederal funding can only go so far in a country where a patchwork of jurisdictions and slow-moving bureaucracies rarely align on the need to quickly construct large-scale clean energy projects.").

454 *See* CHRISTOPHERS, *supra* note 31, at xxi (emphasizing the profit motive of renewable energy backers).

455 *See* GABOR, *supra* note 6, at 23 (highlighting the tension between private capital and public benefit).

profits will be squeezed out of clean energy, far beyond its costs.[456] But as we have traced, and in accordance with other emerging analyses, fiscal derisking also creates substantial risk of *underbuilding* technologies that the public wants but investors operating in market conditions don't view as sufficiently profitable.[457] The best solution might be a model that insources both more of the responsibility for these technologies *and* more of their potential upside.[458]

If and when the possibility for additional federal clean energy legislation is ever on the table, we would urge more creativity and experimentation in modes and methods of state control. As a matter of institutional and policy design, the IRA and IIJA are far from the only option for how federal legislation might approach the clean energy transition.[459] Returning to our typology, federal legislation could empower the federal government to directly develop and own certain critical clean energy infrastructure—thus insourcing risk but also future cost savings.[460]

Even if one supports, as Congress clearly did, a private-sector-forward model of infrastructure development, it is not clear that fiscal derisking is the best starting point for government support. Other approaches—tools drawn from the public utility toolkit or regulatory derisking, for example—might lower the need to fiscally derisk projects out of public coffers, thus proving more efficacious and efficient over the long term. For example, the federal government should do more to regulatorily derisk clean energy by speeding project approvals, permitting, interconnections, and siting. Germany has recently done this to great effect, but it remains politically challenging in the United States.[461] At a minimum, federal legislation could wield its fiscal toolkit more directively, eschewing tax credits for grant-based tools that

456 *See* Boyd, *supra* note 446, at 1014-15 (raising the possibility that private owners, and not the public, will capture the majority of the benefits of renewable energy).

457 *Cf.* CHRISTOPHERS, *supra* note 31, at 75, 94 (arguing that although wind and solar appear cheap, they lack the profitability to drive their development at adequate scale and pace in market-based environments).

458 *See* MARIANA MAZZUCATO, THE ENTREPRENEURIAL STATE: DEBUNKING PUBLIC V. PRIVATE SECTOR MYTHS 13-14 (Hachette Book Grp. rev. ed. 2015) (2013) (arguing for socializing not only the risks of certain investments but also their returns). If executed well (an all-important caveat), public utility law can also fill this role, providing sufficient return on investment but not continuing to pay for resources past the point of full recovery of costs and return.

459 *See supra* Part I.

460 *Cf.* Kapczynski & Michaels, *supra* note 33, at 315-16 (arguing that industrial policy can and should involve "the creation of public enterprises to achieve public aims, or hybrid forms such as public equity stakes" that enhance the ability for public involvement in critical infrastructural projects).

461 *See* Marilen Martin & Akshat Rathi, *The Secret Behind Germany's Record Renewables Buildout*, BLOOMBERG (Aug. 27, 2024, 8:03 AM), https://www.bloomberg.com/news/articles/2024-08-27/how-germany-sped-up-its-deployment-of-solar-and-wind [https://perma.cc/ZL8T-N38D].

would allow it to exact conditions from states or projects in exchange for federal funding.[462]

All that said, *politically* the IRA and IIJA were the strongest bargain that could be struck for the climate.[463] And even their future is far from certain.[464] For now, then, the most pressing aim—which we have attempted to contribute to here—is to understand the model's risks and possibilities.

The South's failed nuclear experiments offer lessons for both federal and state administrations. Federal program administrators hoping to avoid a drift toward nuclear power's failed renaissance must do what they can to impose some logic on the national energy transition and guard against squandered resources or misguided projects. As Amy Kapcyznski and Joel Michaels have observed, "industrial policy necessarily involves a great deal of administrative discretion."[465] Notably and bizarrely, the tax-credit-heavy structure of the IRA means that the Treasury Department is playing a leading role in determining energy transition rules.[466] This fact makes agency coordination and expertise sharing a vital ingredient of successful IRA implementation.

Shoring up agency capacity to manage the clean energy transition will be critical in transforming the IRA's fiscal derisking into successful green industrial policy.[467] Agencies' power in this regard comes via rulemakings, guidance, terms within requests for proposals, and careful monitoring of claimed tax credits.[468] These agency actions will determine whether

462 *Cf.* Bridget A. Fahey, *Federalism by Contract*, 129 YALE L.J. 2326, 2329 (2020) (cataloguing and theorizing "thousands of written agreements that facilitate shared governance among levels of government").

463 *See* Lachlan Carey, *Green Industrial Strategy*, PHENOMENAL WORLD (May 20, 2023), https://www.phenomenalworld.org/analysis/green-industrial-strategy [https://perma.cc/A9BP-2PPS] (describing the IRA as "a masterclass in political pragmatism").

464 *See* Tamborrino, *supra* note 388 (discussing President Trump's plans to scale back IRA implementation).

465 Kapcyznski & Michaels, *supra* note 33, at 279.

466 *See* Press Release, U.S. Dep't of the Treasury, Treasury Announces Coordinated Climate Policy Strategy with New Treasury Climate Hub and Climate Counselor (Apr. 19, 2021), https://home.treasury.gov/news/press-releases/jy0134 [https://perma.cc/7PUC-A5N9] ("[The Treasury Department] has unique responsibilities to lead on a range of programs related to climate change . . . .").

467 *See* Mariana Mazzucato, Rainer Kattel & Josh Ryan-Collins, *Industrial Policy's Comeback*, BOS. REV. (Sept. 15, 2021), https://www.bostonreview.net/forum/industrial-policys-comeback [https://perma.cc/A3Y3-BHVX] (arguing that state capacity to manage a dynamic clean energy transition is critical); Dani Rodrik, *Getting Productivism Right*, PROJECT SYNDICATE (Aug. 8, 2022), https://www.project-syndicate.org/commentary/will-productivism-supersede-neoliberalism-by-dani-rodrik-2022-08 [https://perma.cc/7M8T-Y7G5] (explaining that active state involvement in industrial policy "is likely to work much better . . . than open-ended subsidies or tax incentives").

468 *See, e.g.*, I.R.S. Notice 2022-58, 2022-47 I.R.B. 483 (soliciting input on forthcoming rules governing credits for hydrogen and clean fuel production); OFF. OF FOSSIL ENERGY & CARBON MGMT., U.S. DEP'T OF ENERGY, FOA NO. DE-FOA-0002735, BIPARTISAN INFRASTRUCTURE LAW: REGIONAL DIRECT AIR CAPTURE HUBS 47-55 (2022) (setting forth criteria for eligibility

regulatory hurdles continue to stymie renewable energy's buildout; whether government funding of experimental technologies is squandered or harnessed; whether fossil fuel power plants finally face meaningful constraints; and whether environmental justice communities, energy laborers, and energy consumers experience gains or losses from the transition underway. Moreover, the procedures that these agencies develop for soliciting input on how to manage the transition may have reverberating effects on the perceived legitimacy of the transition for decades to come.[469]

As we have shown, state administration also plays a critical role in accelerating the clean energy transition. Those working at the state level to promote nascent clean energy technology should take heed from the south's nuclear experiences as they consider what legal tools they might use to aid its deployment—and how best to spread its risks. Going forward, careful comparative scholarship on the design of emerging state supports for various clean energy technologies will be a vital contribution to their success, especially during those periods when the federal government appears less inclined to use its powers to support the transition.[470]

Across levels of government, the importance of agency administration for the clean energy transition makes ongoing scholarly conversations in administrative democracy—and the future of the administrative state, more generally—of pressing practical importance.[471] Fiscal derisking measures without attention to state capacity and procedure risk throwing away public money with no climate, labor, or equality gains to show for it.

CONCLUSION

The hoped-for renaissance of nuclear power has yet to emerge. Policymakers' attention has now broadened beyond nuclear to a range of technologies that might play critical roles in the U.S. energy transition, from renewables to energy storage, hydrogen, and emerging methods of capturing and storing carbon. But although many of these technologies are new, our

for direct air capture hub funding); Felicia Wong & K. Sabeel Rahman, *The Productivist Era Has Begun*, DEMOCRACY J., Summer 2023, at 6, 13 ("[S]uccessful implementation of these new efforts at industrial policy will require painstakingly tracking individual grant awards.").

469 *Cf.* K. Sabeel Rahman, *Saving Bidenomics*, BOST. REV. (Jan. 4, 2024), https://www.bostonreview.net/articles/saving-bidenomics [https://perma.cc/5BUJ-QJVR] (arguing that the political viability of the clean energy transition hinges on "show[ing] tangible gains to communities in ways that generate the political power to sustain these efforts against apathy").

470 *See supra* note 388 (describing President-Elect Trump's plans to weaken or eliminate IRA).

471 For scholarly perspectives on administrative democracy, see generally Kapczynski & Michaels, *supra* note 33; K. Sabeel Rahman, *Policymaking as Power-Building*, 27 S. CAL. INTERDISC. L.J. 315 (2018).

strategies for promoting them look similar to the recent failed efforts to relaunch nuclear power.

Our aim in this piece has been to trace what can be learned from these failed efforts. Doing so reveals inherent challenges with a financial derisking approach to infrastructure development but also highlights some ways that federal and state lawmakers and regulators might avoid falling into the traps of the past.

Climate derisking is a messy, uncertain way to pursue an energy transition—but it is the way we have. As derisking proceeds, scholars have a critical role to play in monitoring, analyzing, and diagnosing the progress of the derisked energy transition. Perhaps the administrative tools we have to marginally shape and manage clean energy capital can be improved via learning by doing.[472] Or perhaps the gaps and challenges that emerge as IRA implementation proceeds can help build the intellectual and political case for a more centrally coordinated transition.[473]

Either way, the failed nuclear renaissance provides a cautionary tale, suggesting that federal derisking legislation may unleash capital forces that leverage such initiatives in ways that undermine or stall the clean energy transition. Taking what lessons we can from this policy failure is essential. There is too little time left to decarbonize to get clean energy infrastructure policy wrong again.

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472 *Cf.* Michael C. Dorf & Charles F. Sabel, *A Constitution of Democratic Experimentalism*, 98 COLUM. L. REV. 267, 287-88 (1998) (highlighting the importance of mechanisms of centralized learning for "democratic experimentalism" to function well).

473 *Cf.* Seth Schindler, Ilias Alami & Nicholas Jepson, *Goodbye* Washington Confusion*, Hello* Wall Street *Consensus: Contemporary State Capitalism and the Spatialisation of Industrial Strategy*, 28 NEW POL. ECON. 223, 225 (2023) (tracing how an embrace of derisking has impelled some developing country governments to "articulate autonomous strategic visions" that justify increased state capitalism).