Clean Energy Federalism

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Abstract

Legal scholarship tends to approach the law and policy of clean energy from an environmental law perspective. As hydraulic fracturing, renewable energy integration, nuclear reactor (re)licensing, transport biofuel mandates, and other energy issues have pushed to the forefront of the environmental law debate, clean energy law has begun to emancipate itself. The emerging literature on clean energy federalism is a symptom of this emancipation. This Article adds to that literature by offering two case studies, a novel model for policy integration, and theoretical insights to elucidate the relationship between environmental federalism and clean energy federalism.

Renewable portfolio standards and feed-in tariffs both seek to mitigate global climate change by promoting low-carbon, renewable energy. Despite their shared objective, subtle differences in the design characteristics and regulatory requirements of both policies point to different policy innovation pathways, recommending renewable portfolio standards for implementation at the federal level and feed-in tariffs for implementation at the state level.

Contrary to the literature's traditional view that renewable portfolio standards and feed-in tariffs are mutually exclusive policy alternatives, this Article proposes a model for closely integrating both policies toward a better, more efficient allocation of investor and regulatory risk. Properly integrated, such a joint policy regime could harness the competitive market forces inherent in portfolio standards and redirect them to optimize overall risk allocation. With aggregate risk mitigation greater than the sum of its parts, an integrated policy regime could leverage higher private-sector investment in renewables while requiring lower returns than necessary under less coordinated current policy approaches.

From a theoretical perspective, this Article illustrates how clean energy federalism both draws on and advances the theories shaping

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today's environmental federalism discourse. Specifically, this Article calls for a more nuanced, multidimensional application of environmental federalism's matching principle, offers support for a more open-ended, institutionally agnostic public choice narrative, and operationalizes dynamic federalism theory in the clean energy arena.

INTRODUCTION

Anthropogenic climate change has evolved into one of the world's most daunting challenges of the twenty-first century.[1] As human activity continues to emit carbon dioxide and other greenhouse gases that trap more and more heat in the atmosphere, global warming brings with it ever more extreme weather conditions.[2] From unseasonal droughts to massive flash floods, these conditions cause millions of deaths and trillions of dollars in economic losses.[3] They also require millions of people to relocate, placing their livelihood and fragile geopolitical equilibria in jeopardy.[4] Successful climate change mitigation calls for a timely decarbonization of the American electricity sector, the single largest source of U.S. greenhouse gas emissions.[5] Solar, wind, and other low-

1. *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2013—THE PHYSICAL SCIENCE BASIS 13 (2013) ("Human influence on the climate system is clear. This is evident from the increasing greenhouse gas concentrations in the atmosphere, positive radiative forcing, observed warming, and understanding of the climate system.").

2. *See id.* at 5 (reporting increases in the frequency and intensity of heat waves, heavy precipitations, and other extreme weather and climate events).

3. *See Atlas of Mortality and Economic Losses from Weather, Climate and Water Extremes*, WORLD METEROLOGICAL ORG. (July 11, 2014), https://www.wmo.int/pages/mediacentre/press_releases/pr_998_en.html (reporting that weather- and climate-related disasters have caused $2.4 trillion in economic losses and nearly two million deaths globally from 1970–2012).

4. For a comprehensive analysis of the rapidly growing literature on climate and human conflict, see Solomon Hsiang et al., *Quantifying the Influence of Climate on Human Conflict*, 341 SCI. 1235367, 1235367-12 (2013) (concluding that "anthropogenic climate change has the potential to substantially increase conflict around the world, relative to a world without climatic change").

5. *See* U.S. ENVTL. PROTECTION AGENCY, EPA 430-R-13-001, INVENTORY OF U.S. GREENHOUSE

carbon, renewable energy technologies have the potential to mitigate climate change, ensure America's long-term energy security, and foster economic growth with millions of green jobs. But as long as oil, coal, and other fossil energy technologies are allowed to externalize the cost of their carbon intensity to society and the environment, renewables will struggle to become cost-competitive. Economic theory suggests that a cap-and-trade regime, a carbon tax, or another form of carbon pricing is the most efficient policy to promote abatement technologies such as those for the generation of renewable electricity.[6] Political and economic pressure to keep electricity affordable and America's industry internationally competitive, however, impedes the nationwide adoption of emission pricing policies that capture the full cost of carbon dioxide and other greenhouse gas emissions.[7] In the absence of a realistic price on carbon emissions, the long-term benefits of low-carbon, renewable energy will not be realized without near-term public policy support.[8]

The debate over policy support for renewables across the globe and, more recently, in the United States, is dominated by two deployment policies—renewable portfolio standards (RPSs) and feed-in tariffs (FITs).[9] RPSs create markets for solar, wind, and other renewables by requiring electric utilities to source a portion of the electricity they sell from renewable energy. FITs beckon renewable power generators with above-market rates for their output and guaranteed access to the electricity grid.

GAS EMISSIONS AND SINKS: 1990–2011 ES-19 to -20 (2013), *available at* http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2013-Main-Text.pdf.

6. *See generally* NICHOLAS STERN, THE ECONOMICS OF CLIMATE CHANGE: THE STERN REVIEW 242 (2007); Dominique Finon, *Pros and Cons of Alternative Policies Aimed at Promoting Renewables*, 12 EIB PAPERS 110, 111 (2007), *available at* http://www.eib.org/attachments/efs/eibpapers/eibpapers_2007_v12_n02_en.pdf; Carolyn Fischer & Richard G. Newell, *Environmental and Technology Policies for Climate Mitigation*, 55 J. ENVTL. ECON. & MGMT. 142, 143 (2008); Adam B. Jaffe et al., *A Tale of Two Market Failures: Technology and Environmental Policy*, 54 ECOLOGICAL ECON. 164, 165 (2005) [hereinafter Jaffe et al., *Two Market Failures*]; Atanas Kolev & Armin Riess, *Environmental and Technology Externalities: Policy and Investment Implications*, 12 EIB PAPERS 134, 136, 140 (2007), *available at* http://www.eib.org/attachments/efs/eibpapers/eibpapers_2007_v12_n02_en.pdf.

7. *See* Felix Mormann, *Requirements for a Renewables Revolution*, 38 ECOLOGY L.Q. 903, 930 (2011).

8. *See, e.g.*, LAZARD, LAZARD'S LEVELIZED COST OF ENERGY ANALYSIS—VERSION 8.0, at2 (2014), *available at* http://www.lazard.com/media/1777/levelized_cost_of_energy_-_version_80.pdf; INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, SPECIAL REPORT RENEWABLE ENERGY SOURCES AND CLIMATE CHANGE MITIGATION 14 (2011) (comparing the generation costs of various renewable energy technologies to the cost of electricity from nonrenewable resources).

9. *See, e.g.*, Marc Ringel, *Fostering the Use of Renewable Energies in the European Union: the Race Between Feed-in Tariffs and Green Certificates*, 31 RENEWABLE ENERGY 1 (2006).

In the absence of comprehensive federal policy action on climate change and clean energy,[10] states are increasingly stepping in to fill the policy void.[11] Twenty-nine states, the District of Columbia, and three U.S. territories have adopted RPS policies to promote renewable energy.[12] Despite the widespread popularity of RPS programs at the state level, however, many believe that a federal RPS would yield better results. Over two dozen proposals for a federal RPS and its more inclusive sibling, the clean energy standard[13], have been introduced on Capitol Hill, but none has yet passed both chambers of Congress.[14] FIT policies appear to be embarking on a similar trajectory. Inspired by FIT-induced deployment success in Europe and elsewhere, a growing number of states have recently begun to experiment with FIT policies to promote renewable energy.[15] As has been the case with RPSs, however, some

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10. In light of Congressional deadlock, the Obama administration has opted for an administrative approach to federal climate and clean energy policy. *See, e.g.*, Final Rule: Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, EPA-HQ-OAR-2013-0602 (Aug. 3, 2015) (to be codified at 40 C.F.R. pt. 60), *available at* http://www2.epa.gov/sites/production/files/2015-08/documents/cpp-final-rule.pdf; Final Rule: Standards for Performance for Greenhouse Gas Emissions for New Power Stationary Sources: Electric Generating Units, EPA-HQ-OAR-2013-0495 (Aug. 3, 2015) (to be codified at 40 C.F.R. pts. 60, 70, 71, 98), *available at* http://www3.epa.gov/airquality/cpp/cps-final-rule.pdf.

11. *See* Daniel A. Farber, *Climate Change, Federalism, and the Constitution*, 50 ARIZ. L. REV. 879, 883 (2008); Richard B. Stewart, *States and Cities as Actors in Global Climate Regulation: Unitary vs. Plural Architectures*, 50 ARIZ. L. REV. 681, 683 (2008); *see also* Kirsten H. Engel & Barak Y. Orbach, *Micro-Motives and State and Local Climate Change Initiatives*, 2 HARV. L. & POL'Y REV. 119, 123 (2008) (discussing state and local climate change initiatives).

12. *See* N.C. CLEAN ENERGY TECH. CTR., RENEWABLE PORTFOLIO STANDARD POLICIES (2015), *available at* http://ncsolarcen-prod.s3.amazonaws.com/wp-content/uploads/2014/11/Renewable-Portfolio-Standards.pdf. Eight more states and one U.S. territory have adopted nonbinding goals for the deployment of renewables. *See id.* For a discussion of the history and political background of state RPS programs, see Barry Rabe, *Race to the Top: The Expanding Role of U.S. State Renewable Portfolio Standards*, SUSTAINABLE DEV. L. & POL'Y, Spring 2007, at 10.

13. *See, e.g.*, Clean Energy Standard Act, S. 20, 111th Cong. (2010) (including solar, wind, geothermal, and other renewables as well as clean-coal and new nuclear generation facilities as eligible sources of clean energy). While clean energy standards raise many of the same institutional questions as renewable portfolio standards, this Article focuses on RPS policies as a tribute to their far greater proliferation and lingering concerns over the long-term sustainability of clean-coal, nuclear, and other so-called clean energy technologies. *See also* Mormann, *supra* note 7, at 910.

14. *See* Lincoln L. Davies, *Power Forward: The Argument for a National RPS*, 42 CONN. L. REV. 1339, 1341 (2010) [hereinafter Davies, *Power Forward*]; *see also* Shelley Welton, *From the States Up: Building a National Renewable Energy Policy*, 17 N.Y.U. ENVTL. L.J. 987, 996 (2008) (commenting on the many failed attempts to pass national RPS legislation).

15. These early adopters of FIT programs include California, Hawaii, Maine, Oregon, Rhode Island, Vermont, and Washington. *See* S.B. 32, 2007–2008 Sess. (Cal. 2008); Decisions and Orders, Docket 2008-0273, Haw. Pub. Util. Comm'n (2008); S.P. 367, 126th Leg., (Me.

consider the federal forum better suited for FIT implementation than the states, as evidenced by recent legislative attempts to establish a national FIT program.[16]

A sizeable body of literature debates the merits of RPS programs and, more specifically, the controversial question of whether they ought to be implemented at the federal or state level.[17] In contrast, legal scholars are only just beginning to explore FIT programs as a tool to help decarbonize America's energy economy[18] and have yet to engage the critical question

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2013); H.B. 3039 (Or. 2009), H.B. 3690 (Or. 2009); H.B. 6104 (R.I. 2011); H. 446, Leg. Sess. 2009–2010 (Vt. 2009); S.B. 5101 (Wash. 2005); S.B. 6170 (Wash. 2009); S.B. 6658 (Wash. 2010). Other state legislatures, such as Illinois, Indiana, Kentucky, Maine, Michigan, Minnesota, New York, and Wisconsin, have recently debated proposals for feed-in tariffs. *See* H.B. 5855, 95th Gen. Assemb., Reg. Sess. (Ill. 2008); H.B. 1374, 118th Gen. Assemb., Second Reg. Sess. (Ind. 2014); H.B. 408, 2010 Reg. Sess. (Ky. 2010); H.P. 1061, 125th Leg., First Reg. Sess. (Me. 2011); H.B. 5218 (Mich. 2007); H.B. 4137 (Mich. 2009); H. File No. 3537, 85th Sess. (Minn. 2008); S. 3057, 2013–2014 Reg. Sess. (N.Y. 2013); Assemb. B. 649, 2009–2010 Leg., (Wis. 2010).

16. *See* Renewable Energy Jobs and Security Act, H.R. 5883, 111th Cong. (2010); Renewable Energy Jobs and Security Act, H.R. 6401, 110th Cong. (2008).

17. *See, e.g.*, Christopher Cooper, *A National Renewable Portfolio Standard: Politically Correct or Just Plain Correct?*, ELECTRICITY J., June 2008, at 9; Davies, *Power Forward*, *supra* note 14; Joshua P. Fershee, *Moving Power Forward: Creating a Forward-Looking Energy Policy Based on a National RPS*, 42 CONN. L. REV. 1405 (2010) [hereinafter Fershee, *Moving Power Forward*]; Joshua P. Fershee, *Changing Resources, Changing Market: The Impact of a National Renewable Portfolio Standard on the U.S. Energy Industry*, 29 ENERGY L.J. 49 (2008) [hereinafter Fershee, *Changing Resources, Changing Market*]; Robert J. Michaels, *National Renewable Portfolio Standard: Smart Policy or Misguided Gesture?*, 29 ENERGY L.J. 79 (2008); Mary Ann Ralls, *Congress Got It Right: There's No Need to Mandate Renewable Portfolio Standards*, 27 ENERGY L.J. 451 (2006); Jim Rossi, *The Limits of a National Renewable Portfolio Standard*, 42 CONN. L. REV. 1425, 1428–29 (2010); Benjamin K. Sovacool & Christopher Cooper, *Congress Got It Wrong: The Case for a National Renewable Portfolio Standard and Implications for Policy*, 3 ENVTL. & ENERGY L. & POL'Y J. 85 (2008) [hereinafter Sovacool & Cooper, *Congress Got It Wrong*]; Benjamin K. Sovacool & Christopher Cooper, *State Efforts to Promote Renewable Energy: Tripping the Horse with the Cart*, 8 SUSTAINABLE DEV. L. & POL'Y 5 (2007) [hereinafter Sovacool & Cooper, *Efforts to Promote Renewable Energy*]; Welton, *supra* note 14; Robert J. Lunt, Comment, *Recharging U.S. Energy Policy: Advocating for a National Renewable Portfolio Standard*, 25 UCLA J. ENVTL. L. & POL'Y 371 (2007); *see also* Steven Ferrey, *Renewable Orphans: Adopting Legal Renewable Standards at the State Level*, ELECTRICITY J., Mar. 2006, at 52, 53 (discussing the constitutionality of state renewable energy initiatives).

18. *See, e.g.*, Lincoln L. Davies, *Reconciling Renewable Portfolio Standards and Feed-In Tariffs*, 32 UTAH ENVTL. L REV. 311 (2012) [hereinafter Davies, *Reconciling RPSs and FITs*] (assessing the potential of blending FITs with other policy measures); Lincoln L. Davies, *Incentivizing Renewable Energy Deployment: Renewable Portfolio Standards and Feed-In Tariffs*, 1 KLRI J. LAW & LEGIS. 39 (2011) [hereinafter Davies, *Incentivizing Renewable Energy Deployment*] (providing a broad overview of FITs and RPSs); Lincoln L. Davies & Kirsten Allen, *Feed-In Tariffs in Turmoil*, 116 W. VA. L. REV. 937 (2014) (discussing the effectiveness of FITs worldwide); Michael Dorsi, *Clean Energy Pricing and Federalism: Legal Obstacles and Options for Feed-In Tariffs*, 35 U.C. DAVIS ENVIRONS ENVTL. L. & POL'Y J. 173 (2012) (discussing

of their ideal level of implementation. This Article is the first to address this crucial question by exploring the environmental, economic, regulatory, and political economy factors that determine the comparative merits of RPS and FIT implementation at the federal and state level.

Empirical evidence and qualitative analysis indicate that the widely popular RPS—adopted by nearly thirty states—ought to be implemented at the federal rather than state level. Meanwhile, environmental, economic, and regulatory arguments suggest that FIT programs such as those recently proposed on Capitol Hill promise greater success at the state rather than federal level.

To be sure, RPS and FIT policies could conceivably each be implemented concurrently at both the federal and state levels. Such cooperative federalism has long been a staple of U.S. environmental regulation,[19] as illustrated by the Clean Air Act's requirement of State Implementation Plans for the Environmental Protection Agency's National Ambient Air Quality Standards,[20] with similar, albeit optional, delegation programs under the Clean Water Act for implementation of the National Pollution Discharge Elimination System.[21] In each of these instances, implementing states have the right to go above and beyond the regulatory floors set by the federal government.[22] Recent scholarship has planted a flag for a similar "clean energy floor" approach that would treat federal and state jurisdiction not as independent or mere substitutes but, instead, as interdependent and complementary.[23] The same scholars acknowledge, however, that for the time being judicial interpretation of key energy statutes based on an implied preemption analysis appears to

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conflicts between the federal system and state FIT policies); David Grinlinton & LeRoy Paddock, *The Role of Feed-In Tariffs in Supporting the Expansion of Solar Energy Production*, 41 U. TOL. L. REV. 943 (2010); Katherine D. Kelly, Note, *Don't Hide Behind Statutory Roadblocks: How the United States Can Resolve Conflicts to Implementing the German Feed-In Tariff Model and Contribute to International Efforts to Control Climate Change*, 50 COLUM. J. TRANSNAT'L L. 726, 768–73 (2012) (highlighting the "legal barriers" to implementing FITs in the United States).

19. *See, e.g.*, Clean Air Act of 1963 § 2, 42 U.S.C. § 7402 (2012) ("The administrator shall encourage cooperative activities by the States and local governments . . . ."); Clean Water Act § 103, 33 U.S.C. § 1251(b) (2012) (same); Endangered Species Act of 1973 § 6, 16 U.S.C. § 1531(c)(2) (similar).

20. 42 U.S.C. §§ 7409–7410 (2012).

21. 33 U.S.C. § 1342 (2012).

22. *See, e.g.*, William W. Buzbee, *Asymmetrical Regulation: Risk, Preemption, and the Floor/Ceiling Distinction*, 82 N.Y.U. L. REV. 1547, 1564 (2007) (discussing federal regulatory floors in the context of environmental law).

23. Jim Rossi & Thomas Hutton, *Federal Preemption and Clean Energy Floors*, 91 N.C. L. REV. 1283, 1288 (2013); *see also* Heather Gerken, *Our Federalism(s)*, 53 WM. & MARY L. REV. 1549, 1551 (2012) ("It would be useful if scholars were more attentive to the fact that the questions federalism raises need not involve an either/or answer. Often they will involve a both/and.").

"have blinded regulators and courts from seeing the virtues of clean energy floors."[24] Accordingly, this Article proceeds on the assumption that RPS and FIT policies will each most likely be adopted, if at all, at either the federal or state level, but not both.

RPSs and FITs have traditionally been treated as mutually exclusive policy options.[25] Only recently have scholars and policy makers begun to embrace the possibility that both policies could, in fact, work "hand-in-glove."[26] This Article goes one step further and proposes a model for closely integrating both policies toward a better, more efficient allocation of investor and regulatory risk. Properly integrated, a joint RPS–FIT regime could harness the competitive market forces inherent in portfolio standards and redirect them to optimize overall risk allocation. In interstate competition, these forces would help reduce the cost to ratepayers of FIT programs while driving sustainable deployment of renewable energy technologies. With aggregate risk mitigation greater than the sum of its parts, such an integrated policy regime could leverage higher private-sector investment in renewables while requiring lower returns than under less coordinated current policy approaches. Importantly, the proposed model can accommodate both the existing policy landscape of multiple state RPSs supplemented, in some states, by FIT programs and a possible future policy landscape with a federal RPS complemented by multiple state-level FIT programs, as suggested by this Article's exploration of the ideal institutional level for implementing RPS and FIT policies.

Legal scholarship often approaches energy law and policy, especially related to solar, wind, and other clean energy technologies, from an environmental perspective. Scholars lament the disconnect between energy and environmental law and call for greater convergence of both fields.[27] Yet, as hydraulic fracturing, renewable energy integration,

24. Rossi & Hutton, *supra* note 23, at 1356.

25. *See, e.g.*, Ringel, *supra* note 9, at 1, 14 ("Feed-in tariffs on the one side and green certificates on the other side seem promising tools to foster renewable energies . . . . Whether feed-in tariffs or—more likely—green certificates will be chosen is only a first, generic decision."); Davies, *supra* note 18, at 313 (reporting that, between FIT and RPS policies, "states traditionally have chosen one tool or the other"); Kwok L. Shum & Chihiro Watanabe, *Network Externality Perspective of Feed-in-Tariffs (FIT) Instruments – Some Observations and Suggestions*, 38 ENERGY POL'Y 3266, 3267 (2010) ("Different governments have attempted to use a price [FIT] vs. quantity approach [RPS] for renewable deployment"). For a critique of FITs, see Wilson H. Rickerson et al., *If the Shoe FITs: Using Feed-in Tariffs to Meet U.S. Renewable Electricity Targets*, ELECTRICITY J., May 2007, at 73, 76–78.

26. Davies, *Incentivizing Renewable Energy Deployment*, *supra* note 18, at 83; *see also* Davies, *Reconciling RPSs and FITs*, *supra* note 18, at 313 (questioning "the customary logic on renewable energy policy design" by asking "whether renewable portfolio standards and feed-in tariffs really must be mutually exclusive paths to a more sustainable energy future").

27. *See, e.g.*, Alexandra B. Klass, *Climate Change and the Convergence of Environmental*

nuclear reactor (re)licensing, transport biofuel mandates, and other energy issues have pushed to the forefront of the environmental law debate, clean energy law has begun to emancipate itself. The emerging literature on "clean energy federalism"[28] is a symptom of this emancipation. From a theoretical perspective, this Article adds to that literature by elucidating its relationship with environmental federalism. The inquiry into the ideal institutional level for RPS and FIT policy implementation offers insights that draw on and advance some of the theories that govern today's discourse on environmental federalism. Specifically, these insights suggest a more nuanced, multi-dimensional application of the matching principle,[29] offer support for a more open-ended inquiry under public choice theory[30] for the resolution of multi-

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and Energy Law, 24 FORDHAM ENVTL. L. REV. 180, 204 (2013) (expressing hope that states will continue to bridge the environmental/energy law divide with the federal government soon following suit); Amy J. Wildermuth, *The Next Step: The Integration of Energy Law and Environmental Law*, 31 UTAH ENVTL. L. REV. 369, 380 (2011) (lamenting that "energy law and environmental law today have little to do with each other"); *see also id.* at 369 (arguing that "energy law must become more integrated with environmental law"); Lincoln L. Davies, *Alternative Energy and the Energy-Environment Disconnect*, 46 IDAHO L. REV. 473, 474–75 (2010) (noting that "the law has long thought of energy and the environment as distinct" and observing the "need to bring energy and environmental law closer together").

28. The term "clean energy federalism" is borrowed from Rossi & Hutton, *supra* note 23, at 1284 (applied to subnational clean energy regulation). Unlike Rossi & Hutton, this Article uses the term "clean energy federalism" to include governance issues related to the law and policy of clean energy across all levels of governance, including national, subnational, and supranational institutions. *See also* Alexandra B. Klass & Elizabeth J. Wilson, *Interstate Transmission Challenges for Renewable Energy: A Federalism Mismatch*, 65 VAND. L. REV. 1801, 1802 (2012) (discussing the "complex mix of federal, state, and regional laws, policies, and politics governing both renewable energy goals and transmission planning and siting"); Hari M. Osofsky & Hannah J. Wiseman, *Hybrid Energy Governance*, 2014 U. ILL. L. REV. 1 [hereinafter Osofsky & Wiseman, *Hybrid Energy Governance*] (developing a novel theory of energy governance and using it to assess how institutional innovation can help meet critical energy challenges, such as risk management for hydraulic fracturing, electricity grid stability, and renewable energy integration); David B. Spence, *Federalism, Regulatory Lags, and the Political Economy of Energy Production*, 161 U. PENN. L. REV. 431 (2013) (offering a policy-neutral inquiry into the specific federalism questions posed by hydraulic fracturing for natural gas); Hari M. Osofsky & Hannah J. Wiseman, *Dynamic Energy Federalism*, 72 MD. L. REV. 773, 779 (2013) [hereinafter Osofsky & Wiseman, *Dynamic Energy Federalism*] (laying out principles for a rethinking of energy governance allowing, among others, for more effective integration of cleaner energy sources).

29. The matching principle stipulates that "the size of the geographic area affected by a specific pollution source should determine the appropriate governmental level for responding to the pollution." Henry N. Butler & Jonathan R. Macey, *Externalities and the Matching Principle: The Case for Reallocating Environmental Regulatory Authority*, 14 YALE L. & POL'Y REV. 23, 25 (1996).

30. Originally derived from microeconomics, public choice theory treats regulatory decision making as an analogue to market decision making where legislative, regulatory, and electoral institutions form an economy in which various actors, including citizens, interest groups, and policy makers, exchange regulatory goods based on the same market principles governing the

level governance issues, and operationalize dynamic federalism theory[31] in the clean energy arena.

This Article proceeds in four parts. Part One offers a primer on RPS and FIT policies. Part Two critically reviews the scholarly debate over the ideal institutional level of RPS implementation, tests the validity of the primary arguments on both sides of the federal/state divide for FIT implementation, and explores policy-specific arguments bearing on the ideal locus for FIT policy implementation. Part Three develops the model for closer integration of RPS and FIT policies toward more efficient allocation of investor and regulatory risk and to harness interstate competition as a catalyst for clean energy technology innovation. Part Four relates the insights gleaned from the RPS and FIT case studies in clean energy federalism to some of the most prominent federalism theories in environmental law today.

I. CLEAN ENERGY POLICY–A PRIMER

Public policy support for clean energy deployment, in the United States and around the world, comes in a variety of forms, including tax breaks,[32] reverse auction mechanisms,[33] net energy metering,[34] and many more. In keeping with the institutional questions this Article seeks to explore, this Part focuses on two of today's most dominant policies[35]—RPS and FIT.

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demand and supply of ordinary economic goods. *See, e.g.*, Steven P. Croley, *Theories of Regulation: Incorporating the Administrative Process*, 98 COLUM. L. REV. 1, 34 (1998); Richard A. Posner, *Theories of Regulation*, 5 BELL J. ECON. & MGMT. SCI. 595 (1974).

31. The literature on dynamic federalism seeks to resolve the issue of multi-level governance through multi-layered, interdependent models of governance to incorporate interactions both between and among various levels of government. *See, e.g.*, Kirsten H. Engel, *Harnessing the Benefits of Dynamic Federalism in Environmental Law*, 56 EMORY L.J. 159 (2006).

32. *See, e.g.*, Felix Mormann, *Beyond Tax Credits: Smarter Tax Policy for a Cleaner, More Democratic Energy Future*, 31 YALE J. ON REG. 303 (2014) (critiquing the inefficiencies of federal tax support for renewable energy).

33. *See, e.g.*, Claus Huber et al., *Economic Modelling of Price Support Mechanisms for Renewable Energy: Case Study on Ireland*, 35 ENERGY POL'Y 1172 (2007) (discussing Ireland's reverse auction mechanism); Niels I. Meyer, *European Schemes for Promoting Renewables in Liberalised Markets*, 31 ENERGY POL'Y 665 (2003) (detailing how reverse auction mechanisms have fared in Europe).

34. *See, e.g.*, John V. Barraco, *Distributed Energy and Net Metering: Adopting Rules to Promote a Brighter Future*, 29 J. LAND USE & ENVTL. L. 365 (2014) (discussing the challenges and opportunities associated with solar net energy metering).

35. For an introduction to the potpourri of clean energy policies across the globe, see RENEWABLE ENERGY POLICY NETWORK FOR THE 21ST CENTURY, RENEWABLES 2014: GLOBAL STATUS REPORT (2014), *available at* http://www.ren21.net/Portals/0/documents/Resources/GSR/2014/GSR2014_full%20report_low%20res.pdf.

An RPS, also known as a renewable target or quota obligation, requires electric utility companies to source a certain share of the electricity they sell to end-users from solar, wind, and other renewable sources of energy.[36] Utilities comply with these requirements through "renewable energy credits" (RECs).[37] Eligible power plant operators receive one REC for every megawatt hour (MWh) of electricity generated from renewable resources.[38] Independent power producers can sell their RECs to utilities to earn a premium on top of their income from power sales in the wholesale electricity market.[39] In addition to buying RECs, utilities can also invest in their own renewable power generation facilities to earn RECs for the electricity they produce.[40] Whether utilities choose to earn their own RECs or purchase them from others, the utilities eventually pass the associated costs on to their ratepayers.[41] Most RPSs are technology-neutral and award the same amount of RECs for all eligible renewable energy technologies.[42] Some jurisdictions, however, have implemented technology-specific RPS programs that offer carve-outs or credit multipliers for select renewable energy technologies.[43]

FIT programs, sometimes referred to as CLEAN contracts,[44] are two-pronged policy instruments for the promotion of renewables deployment.[45] The "feed-in" prong guarantees renewable power generators access to the local power grid to ensure viable sales and

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36. *See* Reinhard Haas et al., *A Historical Review of Promotion Strategies for Electricity from Renewable Energy Sources in EU Countries*, 15 RENEWABLE & SUSTAINABLE ENERGY REVS. 1003, 1011–12 (2011); MIGUEL MENDONÇA ET AL., POWERING THE GREEN ECONOMY—THE FEED-IN TARIFF HANDBOOK 161 (Earthscan 2009). Some jurisdictions, including eight states and one U.S. territory, have adopted voluntary renewable energy goals. *See supra* note 12. In light of their limited promotional impact, this Article ignores voluntary programs and focuses on their mandatory counterparts.

37. *See* Davies, *Power Forward*, *supra* note 14, at 1359–60; MENDONÇA ET AL., *supra* note 36, at 161. Internationally, RECs are referred to as Tradable Green Certificates or Renewable Energy Guarantees of Origin.

38. *See* Davies, *Power Forward*, *supra* note 14, at 1378 (reporting that some states award RECs for every kilowatt hour (kWh) of renewable electricity generation).

39. *See id.* at 1360.

40. Haas et al., *supra* note 36, at 1012.

41. *See* Davies, *Power Forward*, *supra* note 14, at 1345 (noting that RPSs do not change price or cost recovery determinations).

42. *Cf. id.* at 1377 (pointing to technology-specific REC multipliers in only about sixteen states in the United States).

43. *Id.* For a critical discussion of the constitutional challenges inherent in some of these programs, see generally Daniel K. Lee & Timothy P. Duane, *Putting the Dormant Commerce Clause Back to Sleep: Adapting the Doctrine to Support State Renewable Portfolio Standards*, 43 ENVTL. L. 295 (2013).

44. *See History*, CLEAN COALITION, http://www.clean-coalition.org/about/history (last visited Sept. 22, 2015).

45. *See* Rickerson et al., *supra* note 25, at 73.

distribution channels.[46] The "tariff" prong requires local electric utilities to purchase the power output of these generators at above-market rates designed to cover the generator's cost and offer a reasonable return on investment.[47] These above-market rates can be set as a fixed total price for electricity from renewables, a premium to be paid in addition to the market price, or a percentage of retail rates.[48] While RPS policies call on the market's invisible hand to determine trading prices for RECs, FIT programs require regulators to set the rates for renewable electricity at a level that incentivizes investment without offering windfall profits.[49] Like their RPS counterpart, FIT policies allow utilities to pass the costs of premium payments for renewable energy on to their ratepayers.[50] FITs tend to be technology-specific, offering different tariff rates for different strands of renewable energy technologies based on their respective technological maturity and generation costs.[51] In addition, FIT design can be size-sensitive in order to account for the different cost structures of large utility-scale and small distributed-generation facilities.[52]

II. EXPLORING THE IDEAL LEVEL FOR CLEAN ENERGY POLICY IMPLEMENTATION

America's energy sector is governed by a shared allocation of regulatory authority between federal and state actors. The resulting potential for cooperation and competition among different levels of government poses difficult institutional questions for climate and clean energy policy, fueling a heated debate over the appropriate level for implementation of RPS policies. The same questions begin to present themselves in the context of FIT policy implementation as more and more

46. *See id.*

47. *See id.* The first ever FIT in the United States, implemented with great success by the municipality of Gainesville, Florida, was designed to offer a return on investment of five to six percent. *See* KARLYNN CORY ET AL., NAT'L RENEWABLE ENERGY LAB., FEED-IN TARIFF POLICY: DESIGN, IMPLEMENTATION, AND RPS POLICY INTERACTIONS 9 (2009). The duration of FIT purchase obligations ranges from eight years in Spain to fifteen years in France to twenty years in Germany. *See* Finon, *supra* note 6, at 115.

48. The second option is sometimes referred to as a "feed-in premium" or "premium feed-in tariff", *see* MENDONÇA ET AL., *supra* note 36, at 40–42. For an example of the retail rate percentage option, *see* Lucy Butler & Karsten Neuhoff, *Comparison of Feed-in Tariff, Quota and Auction Mechanisms to Support Wind Power Development*, 33 RENEWABLE ENERGY 1854, 1855 (2008). Unless expressly stated otherwise, this Article refers to all of these options uniformly as FIT programs.

49. MENDONÇA ET AL., *supra* note 36, at 19.

50. *Id.* at 29.

51. *Id.* at 26. For an example of cost reductions through technology learning in solar photovoltaics and onshore wind energy, see INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 8, at 68, 101.

52. MENDONÇA ET AL., *supra* note 36, at 27.

states begin to experiment with FIT programs to promote low-carbon, renewable energy.

The following inquiry suggests that the ideal level of implementation for climate and clean energy policy is anything but straightforward. In the case of RPS and FIT policies, multiple factors require careful consideration ranging from geographical differences in renewable resource endowment to grid architecture and transmission availability to the shared allocation of regulatory authority. Whether policy makers and scholars prefer federal or state implementation of RPS and FIT policies depends, in large part, on the relative weight they assign to these and other factors. Absent such prioritization, two general trends emerge. First, RPS policy appears to be overall better suited for federal than state-level implementation. The benefits of a uniform federal REC market and the electricity grid's interstate architecture ultimately tip the scales in favor of federal implementation. Second, FIT policy shows more promise for state than federal implementation. The greater ability to address the geographic heterogeneity of renewable resource quality and the snug fit with the allocation of authority across federal and state regulators, among others, argue in favor of state-level implementation of FIT policy.

Building on the rich literature discussing RPS policy, this Part surveys and challenges the primary arguments for RPS implementation at the federal[53] and state[54] levels before testing the respective arguments' relevancy for FIT policy.[55] In light of the two policies' functional differences, the RPS literature cannot possibly consider all factors relevant to the institutional questions surrounding FIT implementation. Accordingly, this Part concludes with a separate section that explores FIT-specific factors bearing on that policy's ideal institutional level of implementation.[56]

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53. *Infra* Section II.A.

54. *Infra* Section II.B.

55. Following the scholarly debate over a national versus state RPS, this Section does not address the underlying question of *whether* an RPS should be implemented at all; rather, it presumes the necessity of policy support for renewables and focuses on the issue of *where*, i.e., at which institutional level it promises the greatest deployment success. In keeping with the existing literature and empirical evidence of RPS and FIT implementation to date, this Article focuses on the federal and state fora as potential loci for the implementation of RPS and FIT policies. The recent trend toward regionalization of U.S. electricity market governance, *e.g.*, through the establishment of Regional Transmission Operators (*infra* note 65), suggests that future research should explore the case for regional implementation of RPS and FIT policies.

56. *Infra* Section II.C.

A. *The Case for Federal Implementation of Clean Energy Policy*

Proponents of federal RPS implementation generally rely on three types of arguments to make their case for a national RPS mandate. The first type builds on the ecologies of scale of the American electricity grid and the environmental benefits that renewable energy offers.[57] The second type draws on the economies of scale that a nationwide RPS mandate would achieve.[58] The third type addresses concerns over regulatory competition and the threat of a race to the bottom as the result of a panoply of competing state-level RPS programs.[59]

1. Ecologies of Scale

The ecologies-of-scale argument for a federal rather than state RPS has two prongs. The first prong relates to the design characteristics of the U.S. electricity sector and its power grid,[60] while the second prong builds on the scale and public goods nature of the environmental benefits that renewable energy technologies create.[61]

a. The Ecology of the U.S. Electricity Sector

U.S. power grids rarely follow state lines.[62] While there is no seamless national power grid,[63] two of the three primary power grids—also referred to as interconnects—serve multiple states.[64] Orders No. 888, 889, and 2000 of the Federal Energy Regulatory Commission (FERC) have led to the formation of a number of Regional Transmission Operators, each of which encompass several different states.[65] As a tribute to the electricity grid's interstate architecture, courts have long

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57. *Infra* Subsection II.A.1.

58. *Infra* Subsection II.A.2.

59. *Infra* Subsection II.A.3.

60. *Infra* Subsection II.A.1.a.

61. *Infra* Subsection II.A.1.b.

62. *See, e.g.*, Davies, *Power Forward*, *supra* note 14, at 1362–63 & n.139.

63. For a discussion of the vision for a U.S. National Transmission Superhighway and the seemingly insurmountable obstacles it faces, see PETER FOX-PENNER ET AL., SMART POWER—CLIMATE CHANGE, THE SMART GRID, AND THE FUTURE OF ELECTRIC UTILITIES 89–92 (Island Press 2014).

64. *See North American Electricity Reliability Corporation Interconnections*, U.S. DEP'T OF ENERGY, http://energy.gov/sites/prod/files/oeprod/DocumentsandMedia/NERC_Interconnection_1A.pdf (last visited Sept. 22, 2015). Texas Interconnect serves most of Texas. The Eastern Interconnect covers parts of Montana, Texas, and South Dakota as well as Nebraska, Kansas, Oklahoma, and all points east. The Western Interconnect encompasses the rest of Montana, Texas, and South Dakota as well as Colorado, New Mexico, and all points west. *See id.*

65. *See* FERC, *Regional Transmission Organization Map*, http://www.ferc.gov/industries/electric/indus-act/rto.asp (last updated Sept. 17, 2015).

acknowledged that the flow of electricity is impossible to trace and inherently interstate in nature.[66]

Furthermore, many electric utility companies serve customers in multiple states. American Electric Power, for instance, delivers electricity to more than 5 million customers through almost 40,000 miles of transmission lines, which cover close to 200,000 square miles, including parts of Arkansas, Indiana, Kentucky, Louisiana, Michigan, Ohio, Oklahoma, Tennessee, Texas, Virginia, and West Virginia.[67] Some commentators expect the formation of more multistate utilities following the Energy Policy Act of 2005[68] with its repeal of the Public Utility Holding Company Act of 1935[69] (PUHCA) that had imposed limitations on utility mergers.[70]

Proponents of a federal RPS argue that only a national RPS mandate can account for and accommodate the U.S. electricity sector's multistate ecology.[71] State-level RPS programs are considered "physically at odds" with the interstate transmission system.[72]

A policy's scope and its level of implementation should reflect the size and structure of its regulatory target. The ecology of the U.S. electricity sector, therefore, can provide valuable guidance in the quest for the ideal level of implementation for renewable energy support policies. Such guidance, however, is only as valuable as its underlying ecological assessment is factually accurate.

When advocates of a federal RPS point to the power grid's interstate architecture, they tend to ignore the pivotal role of existing state and regional seams within the nationwide electricity network. For instance, different protocols and technical standards among the various network operators represent significant obstacles along the path toward a nationwide, seamlessly integrated power grid.[73] By itself, a federal RPS mandate would do little to alleviate problems of network compatibility, much less bring about the idealized "National Transmission Superhighway."[74] To vindicate a national RPS with interstate

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66. *See, e.g.*, New York v. FERC, 535 U.S. 1, 7 (2002); Fed. Power Comm'n v. Fla. Power & Light Co., 404 U.S. 453, 462–63 (1972).

67. *See AEP Sustainability—Reports and Fast Facts*, AM. ELEC. POWER, http://2013.aepsustainability.com/fastfacts/ (providing a map from 2013 that indicates the coverage area of American Electric Power) (last visited Sept. 22, 2015).

68. Pub. L. No. 109-58, §§ 1261–1263, 119 Stat. 594, 972–74 (2005).

69. Pub. L. No. 74-333, 49 Stat. 803 (1935).

70. *See* Davies, *Power Forward*, *supra* note 14, at 1363.

71. *Id.* at 1362.

72. Welton, *supra* note 14, at 998.

73. *See, e.g.*, Michaels, *supra* note 17, at 109 (pointing to different standards among Regional Transmission Operators as key problems "that cannot easily be harmonized").

74. *See* FOX-PENNER ET AL., *supra* note 63, at 89–92; *see also* Fershee, *Changing*

transmission criteria appears almost anachronistic considering the U.S. Court of Appeals for the Fourth Circuit's recent curtailment of FERC's authority to site transmission infrastructure.[75]

FERC has long had jurisdiction over the terms and conditions of all existing electric wholesale, i.e., non-retail or end-use transmission.[76] But it was not until the 2005 Energy Policy Act that FERC received minimal authority over the siting and construction of new transmission lines.[77] The Act grants FERC siting and permitting authority where states are unable or fail to act if the area in question has been designated a "national interest electric transmission corridor."[78] Limited since its inception, FERC's backstop authority has been further curtailed by the Fourth Circuit.[79] In 2009, the court held that FERC could not use its siting authority to override a state's explicit denial to grant a permit.[80] Rather, the court limited FERC's authority to cases where a state refused to act at all or acted "inappropriately by granting a permit with project-killing conditions."[81] In 2011, the U.S. Court of Appeals for the Ninth Circuit went even further by vacating the Department of Energy's Congestion Study that formed the basis of the Department's designation of national interest electric transmission corridors prerequisite to FERC's siting authority.[82] With such strong judicial pushback, it is hardly surprising that no transmission project has proceeded under FERC's siting authority in the decade following the passage of the Energy Policy Act of 2005.[83]

Without superseding federal jurisdiction, interstate transmission projects are difficult to complete, as evidenced by the failure of the Frontier Line project. In 2005, Wyoming, Utah, Nevada, and California signed a memorandum of understanding to construct a 1300-mile transmission line that would leverage 6000 megawatts each of wind power and clean coal power.[84] Since the memorandum's signing, newly

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Resources, Changing Market, *supra* note 17, at 67 (discussing the potential of a "nationwide transmission super highway" (internal quotation marks omitted)).

75. *See* Piedmont Envtl. Council v. FERC, 558 F.3d 304, 315 (4th Cir. 2009); *see also* Fershee, *Moving Power Forward*, *supra* note 17, at 1417–19.

76. *See* 16 U.S.C. § 824(b) (2012); *see also* New York v. FERC, 535 U.S. 1, 17 (2002).

77. *See* Pub. L. No. 109-58, § 1221, 119 Stat. 594, 946–51 (codified at 16 U.S.C. § 824p).

78. 16 U.S.C. § 824p(a) (2012). The Department of Energy has the authority to make such a designation. *Id.* § 824p(h)(2).

79. *Piedmont Envtl. Council*, 558 F.3d at 315 ("Congress intended to act in a measured way and conferred authority on FERC only when a state commission is unable to act on a permit application in a national interest corridor, fails to act in a timely manner, or acts inappropriately by granting a permit with project-killing conditions.").

80. *Id.*

81. *Id.*

82. Cal. Wilderness Coal. v. U.S. Dep't of Energy, 631 F.3d 1072, 1079 (9th Cir. 2011).

83. *See* Fershee, *Moving Power Forward*, *supra* note 17, at 1418.

84. *See* Fershee, *Changing Resources, Changing Market*, *supra* note 17, at 67.

enacted, more ambitious RPS regimes (California and Nevada) and stricter environmental regulation (Utah) have further increased the expected utility of the Frontier Line.[85] Yet, the project has stalled, presumably due to loss of interest or political will in one or more of the participating states.[86]

The interstate activity of some of the electricity sector's primary market participants is an undeniable reality, as the example of American Electric Power's multistate customer base illustrates.[87] But it is not self-evident that the "trend of multi-state utilities is only likely to increase" as advocates of a federal RPS claim.[88] Some commentators consider the 2005 Energy Policy Act's partial repeal of PUHCA ineffective at fostering a widespread consolidation process among electric utilities: "Although there was initial interest in a number of mergers following PUHCA's repeal, many (and perhaps most) have not occurred."[89] Remarkably, the strict scrutiny of proposed mergers at the state level is cited as one of the major reasons for the relatively slow move toward consolidation.[90] One of the few exceptions to this trend, the 2012 merger between Duke Energy and Progress Energy, illustrates just how far the influence of state regulators over interstate utility mergers extends. Duke Energy's then-Chief Executive Jim Rogers offered his demission "to assist" a settlement that ended a merger-related investigation by the North Carolina Utilities Commission.[91] If anything, the post-PUHCA experience with utility mergers appears to have strengthened rather than weakened the role of state regulators.

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85. *See* Fershee, *Moving Power Forward*, *supra* note 17, at 1416–17.

86. *Id.* at 1418. In fact, even the project's website has been taken down. In 2011, a visit to the site (www.frontierline.org) linked on the National Renewable Energy Laboratory's website targeted a domain for sale and recommended its use for Frontier Airlines. The domain has since been taken offline. *But see* Alexandra B. Klass, *The Electric Grid at a Crossroads: A Regional Approach to Siting Transmission Lines*, 48 U.C.D. L. REV. 1895, 1926–28 (2015) (listing recent and ongoing efforts to build long-distance, interstate transmission lines to transport new sources of renewable energy from remote areas to load centers).

87. *See supra* note 67 and accompanying text.

88. *See, e.g.*, Davies, *Power Forward*, *supra* note 14, at 1363.

89. Fershee, *Moving Power Forward*, *supra* note 17, at 1420.

90. *See id.* For a poignant example of the state regulator's pivotal role in utility mergers, see the D.C. Public Service Commission's recent denial of Exelon's $6.4 billion takeover of Pepco Holdings, as discussed in Thomas Heath, *D.C. Regulator Rejects Proposed Pepco-Exelon Merger*, WASH. POST (Aug. 25, 2015), http://www.washingtonpost.com/business/capitalbusiness/dc-regulator-rejects-proposed-exelon-pepco-merger/2015/08/25/e927f8ec-4b3b-11e5-902f-39e9219e574b_story.html.

91. *See* Mark Chediak & Jim Polson, *Duke's Rogers to Resign Next Year in North Carolina Deal*, BLOOMBERG (Nov. 30, 2012, 5:06 PM), http://www.bloomberg.com/news/2012-11-29/duke-reaches-settlement-pact-with-north-carolina-over-ceo-swap.html.

The case for federal rather than state-level RPS implementation based upon the U.S. electricity sector's ecology is not as clear cut as it may seem at first glance. On one hand, a federal RPS appears better suited to address the interstate nature of electricity transmission and trade. On the other hand, states continue to play a pivotal role in regulating these and other core activities of America's electricity industry, including transmission siting and merger control.

In the context of FIT support for renewables, the role of states is even more important. The policy's feed-in prong generally requires state-regulated, local distribution network operators to grant grid access to power generators that rely on renewable sources of energy.[92] More importantly, state public utilities commissions oversee and regulate the local retailers tasked with buying up the generators' renewable power output.[93] Additionally, in markets without retail competition, the same state regulators set the retail rates that allow utilities to recover the costs of their above-market FIT payments by passing them on to their ratepayers.[94]

b. The Ecology of Renewable Energy's Environmental Benefits

The environmental prong of the ecologies-of-scale argument latches onto the public goods nature of the environmental benefits from RPS support for solar, wind, and other renewable power technologies.[95] The generation of electricity from renewable sources is prone to free-rider issues with implications for both technology innovation and distributional justice.

From an innovator's point of view, investment in renewable energy technologies is wrought with risks and uncertainties.[96] In addition to the risk of knowledge spillover innate to all innovative endeavors, innovation related to renewables suffers from another, industry-specific spillover effect. Reductions in greenhouse gas emissions and other environmental

92. *See* MENDONÇA ET AL., *supra* note 36, at 29. An exception exists for utility-scale projects in remote areas where interconnection directly with the transmission network is more practical. *Id.*

93. *Id.* at 29–30.

94. *Id.*

95. *See, e.g.*, Fershee, *Changing Resources, Changing Market*, *supra* note 17, at 74; Sovacool & Cooper, *Efforts to Promote Renewable Energy*, *supra* note 17, at 5; Welton, *supra* note 14, at 997–98. For a general discussion of the role of public goods in the context of environmental regulation, see Jonathan H. Adler, *Jurisdictional Mismatch in Environmental Federalism*, 14 N.Y.U. ENVTL. L.J. 130, 143–45 (2006). For an overview of the expected environmental and other benefits of RPS policies, see Davies, *Power Forward*, *supra* note 14, at 1370–75; Sovacool & Cooper, *Congress Got It Wrong*, *supra* note 17, at 120–32.

96. For a discussion of the impediments to innovation in the realm of renewable energy technologies, see Mormann, *supra* note 7, at 933.

benefits derived from renewables accrue to the public at large, regardless of whether they support electricity generation from renewable energy, e.g., through an RPS-driven premium in their electricity rates.[97] This lack of appropriability makes it difficult for renewables innovators to reap the full financial rewards of their innovative achievements and the environmental benefits they convey. As a result, innovative efforts may remain below the socially optimal level.[98] Proponents of a federal RPS argue that its nationwide reach decreases the risk of environmental spillover, allows for better appropriability, and hence spurs greater innovation in renewable energy technologies.[99]

The corollary to the free-rider problem's implications for renewables innovation raises concerns over its impact on distributional justice. Advocates of a federal RPS draw on the public goods nature of renewable energy's environmental benefits to argue that a national mandate offers greater distributional fairness than a panoply of state-level RPS mandates. A patchwork of scattered state RPSs, they claim, would allow all Americans to enjoy the environmental perks of renewables.[100] Yet these benefits would be financed by the subset of their countrymen who live in states with—allegedly—higher electricity rates to fund their local state RPS.[101] Proponents of a national RPS claim that it would eliminate this lack of distributional fairness and "level the playing field by creating consistent, uniform rules."[102]

When advocates of a federal RPS build their case on the global scale of renewable energy's environmental benefits, they tend to overlook a variety of benefits, environmental and otherwise, that renewables create at a local level. To be sure, as renewable energy technologies reduce the emission of CO_2 and other greenhouse gases responsible for climate

97. *See, e.g.*, Sovacool & Cooper, *Congress Got It Wrong*, *supra* note 17, at 91 ("[E]veryone benefits from the environmental advantages of renewable energy."). A similar claim exists for some of the energy security benefits attributed to renewable energy. *See* Welton, *supra* note 14, at 997.

98. For a detailed discussion of the interplay between the knowledge and environmental spillover effects related to renewables, see Jaffe et al., *Two Market Failures*, *supra* note 6, at 166–67.

99. *See, e.g.*, Fershee, *Changing Resources, Changing Market*, *supra* note 17, at 74; Sovacool & Cooper, *Efforts to Promote Renewable Energy*, *supra* note 17, at 5.

100. *See* Fershee, *Changing Resources, Changing Market*, *supra* note 17, at 74.

101. *See id.*; Sovacool & Cooper, *Efforts to Promote Renewable Energy*, *supra* note 17, at 5.

102. Sovacool & Cooper, *Efforts to Promote Renewable Energy*, *supra* note 17, at 8. *See also* Welton, *supra* note 14, at 998 ("[N]o state is going to be willing or able to bear the costs of nearly half the states acting as laggards on renewable energy, to the detriment of the national interest.").

change,[103] they benefit the public globally.[104] Reduced greenhouse gas emissions, however, are but one of the many environmental and economic benefits of renewable energy.

From an environmental perspective, electricity generation from renewables significantly reduces air pollution from CO_2, SO_X, NO_X, and other pollutants that fossil-fired power plants emit.[105] Studies have long shown that the air concentration and adverse health impacts of these contaminants are particularly strong in the vicinity of coal and other fossil fuel-fired power plants.[106] Recent research confirms that the transition from emission-intensive fossil fuels to renewable sources for power generation would bring with it significant improvements in local and regional air quality.[107] In the same vein, renewable energy technologies such as wind and solar photovoltaics are significantly less water-intensive than their fossil fuel and nuclear counterparts.[108] Water conservation is a benefit that tends to accrue at a local, state, or at least regional level. Solar and wind electricity's sizeable contribution to water conservation is especially relevant in an era characterized by increasingly intense competition for and disputes over local water rights.[109] The localization of renewable energy's environmental benefits is even more prominent regarding the capacity of solar, wind, and other sources of renewable energy to mitigate the ecological risks and damages caused by the

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103. Carbon dioxide is only one of many greenhouse gases. Others include methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride. *Overview of Greenhouse Gases*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/climatechange/ghgemissions/gases.html (last visited Sept. 22, 2015).

104. The worldwide impact of greenhouse gases and their reduction demonstrates that even a national RPS mandate would fail to fully appropriate all of the environmental perks that renewable energy technologies create.

105. *See* Sovacool & Cooper, *Congress Got It Wrong*, *supra* note 17, at 129 (comparing emission profiles across generation technologies).

106. *See, e.g.*, Jonathan Levy & Jack Spengler, *Health Benefits of Emissions Reductions from Older Power Plants*, 9 RISK IN PERSP. 1, 2–4 (2001).

107. *See* Kyle Siler-Evans et al., *Regional Variations in the Health, Environmental, and Climate Benefits of Wind and Solar Generation*, 110 PROC. NAT'L. ACAD. SCI. U.S.A. 11768 (2013).

108. *See* Mark Z. Jacobson, *Review of Solutions to Global Warming, Air Pollution, and Energy Security*, 2 ENERGY & ENVTL. SCI. 148, 163–164 (2009) (comparing the water intensity of renewable and fossil-fueled electricity generation facilities). It should be noted that not all renewable energy technologies are as water-efficient as wind or solar facilities. Hydroelectric facilities, for example, require 4.5–7.6 gallons of water per kWh of electricity output. *See id. See also* Sovacool & Cooper, *Congress Got It Wrong*, *supra* note 17, at 128.

109. For an illustrative example of conflicts over local access to clean and cheap water resources in California, see ELLEN HANAK ET AL., MANAGING CALIFORNIA'S WATER—FROM CONFLICT TO RECONCILIATION 56–62 (2011).

drilling, mining, and hydraulic fracturing required for the extraction of fossil fuels.[110]

In addition to these localized environmental perks, renewable energy technologies offer a multitude of economic benefits at the local rather than national or even global level. Renewable power generation creates new jobs, many of them locally, e.g., for construction and maintenance, often in structurally weak, rural communities.[111]

The environmental and economic benefits of renewable energy may not be sufficiently limited in their geographic scope to provide the degree of appropriability that would allow renewables innovators to reap the full reward of their efforts. The local character of these benefits is, however, significant enough to add a cautionary note to the free-rider narrative commonly cited in favor of federal rather than state-level support for renewable energy. Citizens of a state may initially be reluctant to finance climate change mitigation benefits for their out-of-state neighbors or the world at large. Yet, their payments also deliver a cornucopia of local benefits, such as improvements in air quality, conservation of precious water resources, protection of local ecosystems from harmful fossil fuel extraction, and the creation of employment opportunities. If today's widespread state-level policy experimentation with RPS and FIT programs for renewables is any indication, these local benefits appear valuable enough to justify in-state support for low-carbon, renewable energy technologies—even if the associated climate benefits entail giving a free ride to out-of-state neighbors. Regardless of whether public policy support assumes the form of an RPS or FIT program, the diverse environmental and other benefits of renewable energy can support the case for policy implementation at both the federal and state levels.

2. Economies of Scale

The economies-of-scale argument for RPS policy innovation at the federal rather than state level generally features two angles. The first, more general angle focuses on the sheer size of the U.S. electricity generation sector and its potential for scaling renewable energy technologies. The second, policy-specific angle emphasizes the benefits of a unified national RPS market for REC trading.

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110. For an illustrative example of the enormous environmental dangers of fracking, see David Biello, *What the Frack? Natural Gas from Subterranean Shale Promises U.S. Energy Independence—With Environmental Costs* (Mar. 30, 2010), SCI. AM., http://www.scientificamerican.com/article.cfm?id=shale-gas-and-hydraulic-fracturing.

111. Alan Nogee et al., *The Projected Impacts of a National Renewable Portfolio Standard*, ELECTRICITY J., May 2007, at 33, 42–43; Welton, *supra* note 14, at 990.

a. The Economy of the U.S. Electricity Generation Sector

Advocates of a federal RPS like to point out that a nationwide mandate would almost double the overall size of the relevant market for renewable energy technologies, at least in comparison to the number of states currently governed by RPS programs.[112] As former Senator Jeff Bingaman famously argued: "There is one thing, however, that a State standard cannot do—it cannot drive a national market for the technologies . . . ."[113] The greater size of the market for solar panels, wind turbines, and other renewable power generation equipment is expected to spur technological innovation and make low-carbon, renewable energy technologies more cost-competitive with carbon-intensive fossil fuel incumbents.[114] Over time, a nationwide market unified by a federal RPS would allow for the establishment of a strong domestic manufacturing base for renewable energy technologies.[115] Advocates of a federal RPS claim that, at present, the widespread reliance on imported generation equipment increases construction lead-times and shipping costs, and requires project developers to take costly precautions to hedge currency exchange risks.[116] Finally, proponents praise a uniform federal RPS mandate for its cost-effectiveness as it would allow for the construction of new electricity generation facilities in those parts of the country that offer the best resource availability and lowest cost characteristics.[117]

Public policy support for renewables, whether through an RPS or FIT program, will likely be more effective the larger its target market is. Thus, a national support regime promises greater policy success than a patchwork of state-level support policies. Proponents of a federal RPS tend to overlook, however, that geography is not the only determinant of the target market's size or a policy's overall impact. Other equally important factors include the level of the stipulated renewables quota and its reach, i.e., the eligibility criteria for targeted utility companies.[118]

The steadfast opposition on Capitol Hill to a federal RPS or comprehensive climate policy in general makes it unlikely that an ambitious renewables quota would receive congressional approval in the

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112. Davies, *Power Forward*, *supra* note 14, at 1366–67; Welton, *supra* note 14, at 1000.

113. 153 CONG. REC. S7582, 7598 (daily ed. June 13, 2007) (statement of Sen. Bingaman).

114. For an analogy to the technological advances in electricity generation from coal and nuclear energy, see Sovacool & Cooper, *Congress Got It Wrong*, *supra* note 17, at 94–95.

115. *See* 151 CONG. REC. S6671, 6685 (daily ed. June 16, 2005) (statement of Sen. Salazar); *see also* Sovacool & Cooper, *Congress Got It Wrong*, *supra* note 17, at 96.

116. Sovacool & Cooper, *Congress Got It Wrong*, *supra* note 17, at 96–97.

117. *See* Welton, *supra* note 14, at 1000.

118. One of the few advocates of a federal RPS to acknowledge the importance of these and other design criteria is Davies, *Power Forward*, *supra* note 14, at 1385–90.

near future.[119] To be sufficiently palatable for bipartisan support, a successful proposal would need to set a relatively conservative quota with a plethora of exemptions to accommodate local industry needs. Geographic gains from a federal policy approach would likely come at the expense of a federal RPS's aspirational aggressiveness and thus spur modest growth in renewables at best. In the end, existing state RPS support for renewables may prove to be worth more than the sum of its parts would be in a federally palatable RPS regime with renewable energy targets that might reach further geographically but would likely aim lower aspirationally and, ultimately, have a shallower impact. Meanwhile, state-level support for renewables has set the bar fairly high, as current state RPS regimes already cover approximately 70% of the American population.[120] Moreover, contrary to some RPS nationalists' view, a federal RPS is not necessary to allow for the nationwide siting of renewable energy plants to exploit the most resource-rich areas of the country. Many state RPSs allow local utilities to meet their sourcing obligations with electricity and RECs from renewable power plants located out-of-state.[121]

As a matter of theory, there is little doubt that an aspirationally aggressive, universally binding federal RPS would be more effective than today's patchwork of independent state RPSs covering only seven out of every ten Americans. The political reality of two dozen failed proposals for a federal RPS, however, casts serious doubt on the viability of an ambitious, nationwide renewables mandate.[122] Public choice theory suggests that electric utilities, energy-intensive manufacturing, fossil fuel interests, and other well-organized industries will continue to do everything they can to dilute, if not altogether prevent, a meaningful federal RPS.[123] The same public choice challenges present themselves in the context of a federal FIT program, albeit in a different metric. While

119. The Obama Administration's decision to tackle the challenges of climate change without Congress illustrates the seemingly insurmountable obstacles to congressional support for comprehensive climate change policy. *See* EXEC. OFFICE OF THE PRESIDENT, THE PRESIDENT'S CLIMATE ACTION PLAN (2013); *see also supra* note 10.

120. Twenty-nine states and the District of Columbia currently have RPS regimes. *See supra* note 12 and accompanying text. The populations of these states total approximately 220 million, while the national population is approximately 319 million as of 2014. *See American Factfinder*, U.S. CENSUS BUREAU, http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP_2014_PEPANNRES&src=pt (last visited Sept. 22, 2015). *But see* Davies, *Power Forward*, *supra* note 14, at 1341 & n.9 (recognizing at least thirty-six states with RPS regimes).

121. For an overview of local, state, and regional preferences or limitations in state RPS regimes, see Davies, *Power Forward*, *supra* note 14, at 1380.

122. *See supra* note 14 and accompanying text.

123. For a more detailed discussion of public choice theory, see *infra* Section III.B.

the aspirational aggressiveness of an RPS policy is measured by the percentage of a utility's electricity sales to be sourced from renewables, the ambitiousness of a FIT policy is commonly evaluated based on the premium that the tariff mandates utilities to pay above wholesale market prices for renewable electricity. Public choice theory suggests that a federal FIT policy would need to set relatively low tariff payments to gain congressional approval. A tariff set too low, however, is unlikely to achieve the desired deployment of low-carbon, renewable power generation capacity.[124]

b. The Economy of a Unified Market for REC Trading

The principal argument voiced by virtually every proponent of a federal RPS draws on the economies of scale expected from a unified national market for REC trading. They criticize that the "multiplicity of state standards" has led to a "proliferation of state RECs markets."[125] Additionally, they blame contradictory and inconsistent definitions in state RPS mandates for having "splintered the national renewable energy market into regional and state markets with conflicting rules on the treatment and value of RECs."[126] A recent study of state RPS mandates found that, despite creating a common ground for many renewables, "there is no single 'renewable product' across state lines."[127] The variety in definitions of renewable energy sources eligible for RECs is exacerbated by the "conflicting rules on the treatment and value of RECs."[128] Proponents of a federal RPS also criticize state RPS regimes for giving their certificates different shelf lives, ranging from three years in Michigan to indefinite validity in Arizona.[129] The differing ability to bank RECs for future proof of compliance directly affects REC market value, inevitably fostering the creation of different subclasses of certificates. In fact, there is not even one universally accepted currency for state-issued RECs. While most states award one REC per MWh of eligible renewable electricity, some issue RECs on a per kilowatt hour (kWh) basis.[130] In addition, state RPS mandates vary considerably in their aspirational aggressiveness as well as in their planning and enforcement

124. *See* MENDONÇA ET AL., *supra* note 36, at 57. *See also infra* note 226 and accompanying text.

125. Welton, *supra* note 14, at 999–1000.

126. Sovacool & Cooper, *Congress Got It Wrong*, *supra* note 17, at 105.

127. Davies, *Power Forward*, *supra* note 14, at 1376.

128. Sovacool & Cooper, *Congress Got It Wrong*, *supra* note 17, at 105.

129. Davies, *Power Forward*, *supra* note 14, at 1378 & n.246.

130. *Id.* at 1378.

rigor, all of which affect—directly or indirectly—the market value of RECs.[131]

Advocates of federal instead of state implementation of RPS policy blame the diversity of state RPS programs for their limited policy effectiveness and efficiency. In particular, the multiplicity of state standards is criticized for producing huge fluctuations in REC market prices, ranging from $1.75 in California to $35 in New England for a wind energy certificate over one MWh.[132] As a result, compliance costs soar along with attempts to abuse the multistate system through double counting of RECs in various states and other manipulation.[133] Some proponents celebrate a federal RPS as the panacea that will establish a unified national REC market with harmonized definitions, accounting, and compliance rules.[134] A more liquid, transparent, and less volatile national REC market under the umbrella of a federal RPS is expected to increase investment in renewable energy technologies while saving utilities and their ratepayers billions of dollars in compliance costs.[135]

Efficiency gains from a unified national REC market are likely the strongest argument in favor of a federal RPS in lieu of a multitude of state RPSs. Economic theory supports the claim that greater market liquidity will reduce price volatility while uniform market definitions and standardized eligibility criteria help drive down the cost of compliance for utility companies and their ratepayers. Meanwhile, state-based approaches to building a unified REC trading market across different state RPS regimes have proven largely unsuccessful.[136] The market unification argument weighs heavily in favor of federal RPS implementation, but it has no bearing on the ideal institutional level of FIT policy implementation. As price-based support mechanisms, FIT programs do not rely on markets but on regulators to determine the price level of renewable energy support.[137]

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131. *Id.* at 1360–62.

132. Sovacool & Cooper, *Congress Got It Wrong*, *supra* note 17, at 105. *See also infra* note 238 and accompanying text.

133. *See* Christopher B. Berendt, *A State-Based Approach to Building a Liquid National Market for Renewable Energy Certificates: The REC-EX Model*, ELECTRICITY J., June 2006, at 54, 57.

134. Welton, *supra* note 14, at 1000.

135. *See* Berendt, *supra* note 133, at 66 ("The security that a liquid national REC market would bring to U.S. renewable energy finance is of paramount importance."). For projections of the expected savings in compliance costs, see Sovacool & Cooper, *Congress Got It Wrong*, *supra* note 17, at 108–09; *see also* Davies, *Power Forward*, *supra* note 14, at 1379 ("Federal competition should not just make REC prices more uniform; it should drive them down.").

136. *See* Berendt, *supra* note 133, at 54–55.

137. *See supra* note 49 and accompanying text.

3. Regulatory Leakage and the Race to the Bottom

The third and final argument for a federal RPS builds on a commonly observed phenomenon in environmental regulation, often referred to as the "race to the bottom." The concept points to the competitive relationship between various regulators, such as states, that aim to ensure a healthy environment while also attracting industry and business to ensure their constituents' economic prosperity.[138] Rent-seeking actors look to benefit from the heterogeneity of the regulatory landscape by (re)locating to states with less stringent or no environmental regulation at all.[139] Such leakage is a common challenge for policies that aim to reduce pollution and other socially undesirable activities but, in the process, impose compliance costs on affected industries.[140] Some proponents of a federal RPS claim that the existing "hodgepodge regulation" of state-level RPSs promotes a regulatory race to the bottom between the states, with some trying to avoid leakage streams and others hoping to benefit from them.[141]

The flow of leakage streams and, with it, the strength of the race-to-the-bottom argument depend on the mobility of those adversely affected by environmental policy and regulation. In the case of RPS or FIT policy support for renewables, electric utilities and, ultimately, their customers bear the burden. RPS-specified renewables quotas and the purchase obligations imposed by FIT programs limit utilities in their procurement planning and choice of fuel sources.[142] Given time, utilities may be able to shift some of their generation capacity from one state to another to

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138. *See, e.g.*, Kirsten H. Engel, *State Environmental Standard-Setting: Is There a "Race" and Is It "To the Bottom"*, 48 HASTINGS L.J. 271, 274 (1997) ("The term 'race-to-the-bottom' refers to a progressive relaxation of state environmental standards, spurred by interstate competition to attract industry, that also occasions a reduction in social welfare below the levels that would exist in the absence of such competition."). For a snapshot of the lively literature debating the validity of the race-to-the-bottom argument, see, for example, Daniel C. Esty, *Revitalizing Environmental Federalism*, 95 MICH. L. REV. 570 (1996); Richard L. Revesz, *Rehabilitating Interstate Competition: Rethinking the "Race-to-the-Bottom" Rationale for Federal Environmental Regulation*, 67 N.Y.U. L. REV. 1210 (1992) [hereinafter Revesz, *Rehabilitating Interstate Competition*]; Richard L. Revesz, *The Race to the Bottom and Federal Environmental Regulation: A Response to Critics*, 82 MINN. L. REV. 535 (1997) [hereinafter Revesz, *Race to the Bottom*]; Peter P. Swire, *The Race to Laxity and the Race to Undesirability: Explaining Failures in Competition Among Jurisdictions in Environmental Law*, 14 YALE L. & POL'Y REV. 67 (1996).

139. Davies, *Power Forward*, *supra* note 14, at 1368–69.

140. *See* Erwin Chemerinsky et al., *California, Climate Change and the Constitution*, ENVTL F., July/August 2008, at 50, 52. For a discussion of leakage issues in the context of energy regulation and emission pricing, see Mormann, *supra* note 7, at 931.

141. *See, e.g.*, Davies, *Power Forward*, *supra* note 14, at 1362, 1368–69; Michaels, *supra* note 17, at 107; Rossi, *supra* note 17, at 1431.

142. *See supra* notes 36, 47, and accompanying text.

escape strict environmental standards.[143] But, they are unlikely to roll up the cables of their transmission and distribution lines or move their customer base out of state to regain their freedom of fuel choice. The risk of regulatory leakage from utility migration, therefore, is practically negligible.

Ratepayers bear the financial burden of RPS- and FIT-induced premium payments to promote power generation from renewables. Private households and small businesses are unlikely to relocate solely on the basis of modest increases in their electricity bills. Empirical evidence suggests, however, that some particularly energy-intensive industries are sensitive to rising production costs from increased rates for renewable energy and may react by relocating their production facilities to jurisdictions with lower electricity rates.[144] Sophisticated FIT design can mitigate, if not altogether prevent, leakage by exempting select industries from sharing the cost of renewables support without sacrificing overall policy efficacy.[145] International examples of industry-sensitive, yet promotionally effective FIT programs include Austria, Denmark, Germany, and the Netherlands.[146]

Upon closer inspection and consideration of the utility industry's structural characteristics, the race-to-the-bottom argument carries relatively little weight in favor of a federal over state-level RPS and even less weight for federal rather than state implementation of a FIT program.[147]

B. *The Case for State Implementation of Clean Energy Policy*

The advocates of RPS support for renewables at the state level build their case on arguments that fall into three categories. The first category rebuts the necessity of a federal RPS in light of existing state efforts to promote renewable energy. The second category harnesses the differences in renewable energy resource availability across states and their distributional implications. The third category emphasizes the historical role of states as the regulators of fuel choices.

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143. Chemerinsky et al., *supra* note 140, at 52.

144. An illustrative example of leakage resulting from high electricity prices for energy-intensive industries is the relocation of a Spanish steel plant to Poland in response to increased energy costs. GABRIEL C. ÁLVAREZ ET AL., UNIVERSIDAD REY JUAN CARLOS, STUDY OF THE EFFECTS ON EMPLOYMENT OF PUBLIC AID TO RENEWABLE ENERGY SOURCES 33 (2009).

145. *See, e.g.*, Felix Mormann et al., *A Tale of Three Markets: Comparing the Renewable Energy Experiences of California, Texas, and Germany*, 35 STAN. ENVTL. L.J. (2016 forthcoming) (showing that exempt energy-intensive industrial customers in Germany pay less for electricity than their competitors in California and Texas).

146. *See* MENDONÇA ET AL., *supra* note 36, at 55.

147. As this Article elaborates in Subsection III.C., there are strong arguments to expect a race to the top as the likely outcome of state-level feed-in tariff support for renewables.

1. The Redundancy of Multilevel Efforts

The counterpoint to the race-to-the-bottom argument for a federal RPS argues that existing efforts to promote renewables at the sub-federal level have proven successful and do not warrant displacement with a national RPS mandate: "Activities on a number of fronts supplant the need for a federal RPS."[148] References to a long list of local, state, and regional policy measures in support of renewable energy usually accompany this assertion.[149] Others narrow the scope of the argument with a specific reference to existing state-level RPS mandates and their coverage of two-thirds of the U.S. population.[150] Moreover, regulatory competition among states and their RPS regimes is expected to improve the overall quality of regulation as states learn from each other's failures and successes.[151] Ultimately, the redundancy argument is not so much a call for continued (and more) state RPSs as it is an argument against too much federally mandated support for renewables deployment, especially by way of a national RPS.

The strong impetus for state-level RPSs and, more recently, for state FIT programs would appear to confirm the redundancy of a federal RPS regime. After all, more than 220 million Americans already live in states with RPS regimes.[152] More than twenty states with a total of nearly 100 million inhabitants, however, have not yet set binding goals for the deployment of renewable energy technologies.[153] At present, state FIT programs in the United States cover no more than seven states and approximately 54 million Americans.[154] Most importantly, a federal RPS or FIT would not necessarily have to displace existing state RPS or FIT programs. A multilevel RPS scenario, however unlikely in the current political climate, could emulate successful examples from other areas of competing environmental regulation, such as air quality, where the

148. Ralls, *supra* note 17, at 451; *see also* Kevin L. Doran, *Can the U.S. Achieve a Sustainable Energy Economy from the Bottom-Up? An Assessment of State Sustainable Energy Initiatives*, 7 VT. J. ENVTL. L. 95, 116 (2006).

149. *See, e.g.*, Ralls, *supra* note 17, at 456–60. For further discussion of the role of states as energy drivers, see Steven Ferrey, *Power Future*, 15 DUKE ENVTL. L. & POL'Y F. 261, 284–87 (2005).

150. Michaels, *supra* note 17, at 90 ("Since 2/3 of the population already lives in RPS states, it is not clear why adding the remainder will yield significant additional cost reductions.").

151. *Id.* at 108.

152. *See supra* note 120 and accompanying text.

153. Approximately 220 million of 319 million total Americans live in states with RPS regimes. *See supra* note 120 and accompanying text. This leaves more than ninety million Americans in states without RPS regimes.

154. The seven states with FIT programs are California, Hawaii, Maine, Oregon, Rhode Island, Vermont, and Washington. *See supra* note 15. The populations of these states total approximately 54 million. *See American Factfinder*, *supra* note 120.

federal government sets minimum standards while allowing the states to adopt stricter regulation.[155] Similarly, a state FIT policy does not necessarily preclude a renewable power plant operator from claiming additional federal subsidies, such as accelerated depreciation rates and tax credits.[156] The redundancy argument, thus, carries little weight against a federal RPS or FIT and does little to promote the adoption of new state policies to deploy renewable energy technologies.

2. The Geography of Renewables and Distributional Justice

The principal argument in support of state-level RPSs builds on the uneven geographic allocation of renewable energy resources across the United States. Based on regional climate conditions, topography, and other land characteristics, the endowment with renewable energy resources varies significantly between states and across different strands of renewable energy technologies.[157] A nationwide case study found that the central United States, including Kansas, Montana, Nebraska, North Dakota, Oklahoma, South Dakota, and Wyoming, offers the highest potential for wind energy.[158] Eastern and southern states, such as Georgia, Louisiana, Maine, Mississippi, and Virginia, have the greatest biomass resources for electricity generation.[159] Geothermal resources are concentrated in western states, such as California, Nevada, Utah, and Hawaii.[160] Some degree of solar energy is available in virtually every state in the nation, but its quality and suitability for power generation vary considerably.[161]

Politicians have long harnessed the heterogeneity of renewable resources across the country to call for state rather than federal support of renewable energy technologies: a "one-size-fits-all Federal mandate does not take into account the specific energy and economic needs of individual States by requiring that fifteen percent of retail electricity sales be generated from specific renewable resources which are not prevalent"

155. *See, e.g.*, California's more stringent standards for motor vehicle emissions adopted under the Clean Air Act's waiver provision of 42 U.S.C. § 7543(b) (2012). *See also* BUZBEE, *supra* note 22, at 1564 (discussing examples of federal regulatory floors in environmental law).

156. *See, e.g.*, 26 U.S.C. § 168(e)(3)(B)(vi)(I) (2012) (accelerated depreciation); 26 U.S.C. § 45 (2012) (production tax credit); *id.* §§ 25 and 48 (investment tax credit). For a critical analysis of the efficacy and efficiency of federal tax credit support for renewable energy, see generally Mormann, *supra* note 32, at 318–23.

157. *See* Rossi, *supra* note 17, at 1431.

158. Fredric C. Menz, *Green Electricity Policies in the United States: Case Study*, 33 ENERGY POL'Y 2398, 2400 (2005).

159. *Id.* at 2400–01.

160. *Id.* at 2401.

161. *Id.* at 2400.

in every state or region.[162] The George W. Bush Administration opposed a federal RPS with the argument that "these standards are best left to the States. A national RPS could raise consumer costs, especially in areas where these resources are less abundant and harder to cultivate or distribute."[163]

The supporters of state-level RPS programs hone in on the distributional implications of a federal RPS. They argue that a national RPS mandate would result in a significant transfer of wealth from states with scarce renewable energy resources to those with an abundance of renewables.[164] Under a federal RPS, renewables-poor states would have to buy energy and RECs from states with richer renewables endowments, dividing states into winners and losers.[165] Advocates of state RPSs emphasize that state-by-state regulation allows for mandates that are better tailored to local resource availability: "States and local programs have been structured to take advantage of Mother Nature as well as man-made and animal-generated products."[166] State-level policy is considered better suited to cater to the specific needs of individual states and to exploit opportunities peculiar to certain states and regions.[167]

The heterogeneous geographic allocation of renewable energy resources and its distributional implications present strong arguments for policy implementation at the state level. Giving states latitude to design and implement the policy that best harnesses locally available resources would help limit wealth transfers among states. A federally mandated RPS or FIT program is unlikely to account for variations across states regarding renewable resources, load profiles, transmission infrastructure, and other key variables in the next energy economy. State policies, on the other hand, can be tailored to make the most of existing resources, thereby matching costs and benefits in geographic terms. Aside from reductions in greenhouse gas emissions, many environmental and economic benefits of electricity generation from renewables accrue locally.[168]

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162. *See* 153 CONG. REC. H9843, 9848 (daily ed. Aug. 4, 2007) (statement of Rep. Stearns).

163. OFFICE OF MGMT. & BUDGET, EXEC. OFFICE OF THE PRESIDENT, STATEMENT OF ADMINISTRATION POLICY, H.R. 6—ENERGY POLICY ACT OF 2005.

164. See, for example, the argument laid out by Fershee, *Changing Resources, Changing Market*, *supra* note 17, at 59.

165. For a summary of the "winners-and-losers" argument, see Davies, *Power Forward*, *supra* note 14, at 1367.

166. Ralls, *supra* note 17, at 468 (pointing to Maryland's RPS, which includes poultry-litter incineration as a qualifying source of energy, so as to utilize an otherwise unused byproduct of a well-established branch of Maryland's industry). *See* MD. CODE ANN., PUB. UTILS. § 7-701(r)(9) (West 2015) (listing poultry litter-to-energy as a qualifying renewable source under the Maryland RPS).

167. Doran, *supra* note 148, at 97–98.

168. *See supra* notes 105–11 and accompanying text.

Conceptually, state RPS programs can reflect the social value of local benefits, e.g., through credit multipliers for RECs from in-state power generation.[169] However, the current wave of anti-RPS litigation cautions that such preferential RPS treatment for in-state resources at the expense of out-of-state firms may run afoul of the Constitution's dormant Commerce Clause.[170] With rate structures statutorily based on *local* avoided cost,[171] state-level FIT programs are better suited than RPS regimes to reflect and reward the social value of various locations, technologies, and sizes of renewable power plants.[172] Relying on the states' ratemaking authority under the 1978 Public Utilities Regulatory Policies Act (PURPA), state FITs can ensure that local ratepayers fund in-state renewable power projects that yield local benefits for that state's citizens to enjoy.

3. Historical State Jurisdiction over Fuel Choice

Another type of arguments for state rather than federal implementation of RPS policy draws on the historical role of states as energy drivers.[173] Traditionally, decisions over fuel choices, power generation portfolios, and resource development have been within the purview of the states, not Capitol Hill.[174] The National Association of Manufacturers and the Edison Electric Institute—the electric utility industry's trade association—jointly call for greater deference to state authority.[175] The advocates of state RPS programs point to the acknowledgment of states' regulatory authority under PURPA and, more recently, the 2005 Energy Policy Act.[176] The latter, for instance, did not require states to *mandate* a specific fuel mix for local electricity generation but only to *consider* the implementation of fuel diversity

169. For examples of credit multipliers, see Davies, *Power Forward*, *supra* note 14, at 1399.

170. For a discussion of recent and pending litigation challenging the constitutionality of state-level RPS programs on Commerce Clause grounds, see Steven Ferrey, *Follow the Money! Article I and Article VI Constitutional Barriers to Renewable Energy in the U.S. Future*, 17 VA. J. L. & TECH. 89, 106–09 (2012); Stephen Ferrey, *Threading the Constitutional Needle with Care: The Commerce Clause Threat to the New Infrastructure of Renewable Power*, 7 TEX. J. OIL GAS & ENERGY L. 59, 90–96 (2011); Lee & Duane, *supra* note 43, at 312–13.

171. *See* 16 U.S.C. § 824a-3(b) (2012).

172. For a more detailed discussion of FIT policies' capacity to provide tailored support for renewable energy technologies, see Felix Mormann, *Constitutional Challenges and Regulatory Opportunities for State Climate Policy* (working paper, on file with the author).

173. *See* Ferrey, *supra* note 149, at 284.

174. Ralls, *supra* note 17, at 454; Rossi, *supra* note 17, at 1447–48.

175. *See* Davies, *Power Forward*, *supra* note 14, at 1369–70 ("[S]tates and their utilities—not the federal government—should be allowed to make their own fuel choices.").

176. For an illustrative overview of states' authority under PURPA and the Energy Policy Act, see Ralls, *supra* note 17, at 456–59.

plans.[177] Similarly, existing state programs may be grandfathered in under PURPA in recognition of states' historical jurisdiction over fuel choices and resource development.[178]

The history of state jurisdiction over fuel choice is, in fact, a corollary to the geography-of-renewables argument. State fuel choice can appear as a regulatory tribute to the necessity of addressing geographic variations in renewable and nonrenewable resource endowment at a more localized level.[179] Geography aside, states' historical sovereignty over the composition of utilities' fuel mix is not a strong argument to endorse state over federal implementation of renewable energy policy. From a regulatory perspective, however, state fuel choice is deeply embedded in the rules and regulations that govern the U.S. electricity sector. Any attempt to vest the authority to mandate the fuel mix of state-regulated utilities at the federal level would, therefore, require substantial regulatory reform. From a functional point of view, the history of state jurisdiction over utility fuel choice and its regulatory manifestation suggest that support for renewable energy through RPS or FIT policy will be more straightforward to implement at the state level.

C. *Policy-Specific Considerations for Feed-In Tariff Implementation*

The preceding analysis of the scholarly debate over state versus federal implementation of RPS policy reveals that some of the principal arguments on both sides do not apply to FIT support for renewables. Careful examination of the U.S. electricity sector and the conceptual characteristics of FIT policies, however, suggests persuasive, policy-specific arguments for implementing FIT programs at the state rather than federal level. The first argument builds on the federalist system's allocation of regulatory authority for power generation, transmission, and sales. The second argument emphasizes the possibility to tailor FIT design to local infrastructure, resources, and demand.

1. Building on Existing State Regulatory Authority

America's electricity industry is governed by a shared allocation of regulatory authority between the federal and state levels. The 1935 Federal Power Act vests FERC with jurisdiction over interstate electricity transmission and wholesale power sales, i.e., to utility companies and other power traders.[180] States, through their public utility commissions,

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177. *See* 16 U.S.C. § 2621(d)(12) (2012).

178. For further details on the possibility of a grandfather provision under the so-called "savings clause," see Ralls, *supra* note 17, at 465.

179. *See supra* Subsection II.B.2.

180. *See* 16 U.S.C. § 824(b) (2012). The Federal Power Act defines the sale of electricity at wholesale as the "sale of electric energy to any person for resale." *Id.* § 824(d).

oversee and regulate local distribution and the sale of electricity at the retail level, i.e., to end-use customers.[181] PURPA has expanded state jurisdiction over rate regulation to include, within certain requirements,[182] the sale of electricity from qualifying renewable electricity generators to electric utilities.[183]

State-level FIT programs offer a perfect match with this shared allocation of authority between state and federal regulators. PURPA vests state public utility commissions with jurisdiction to regulate the interconnection of renewable electricity plants with the local distribution grid.[184] This regulatory mandate includes the authority to require utilities and local network operators to grant renewable generators priority grid access, as required for successful FIT design.[185] State jurisdiction further encompasses the authority to require utilities to purchase the electricity that qualifying renewable power generators feed into the grid.[186] Finally, the regulation of retail rates for electricity sales traditionally lies within the purview of state public utility commissions.[187] International experience with FIT policy design and implementation indicates that leveraging costs across all ratepayers best recoups utilities' expenditures associated with above-market tariff payments for renewable power. Such cost recovery can be included in retail rates as a fuel surcharge or by means of a system benefits charge.[188] Outside of fully restructured, competitive retail markets, either approach requires approval of the respective utility's retail rates by the state's public utility commission. Overall, state-level FITs fit the existing framework for U.S. electricity regulation as snugly as a well-tailored coat.

In contrast, implementation of a FIT program at the federal level would require significant regulatory reform, encroaching upon traditional domains of state regulatory sovereignty such as local interconnection,

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181. *See id.* § 824(b)(1).

182. One crucial and highly controversial requirement is that the state-set rates do not exceed the avoided cost of utilities. For a list of the criteria that states have to consider when setting rates under PURPA, see 18 C.F.R. § 292.304(e) (1985).

183. *See* 16 U.S.C. § 824a-3 (2012). By definition, such transactions occur at wholesale and would normally fall under the purview of FERC's regulatory authority. *See supra* note 180 and accompanying text.

184. *See* 18 C.F.R. § 292.303(c) (1985); 18 C.F.R. § 292.306(a) (1985).

185. *See also supra* note 92.

186. *See* 18 C.F.R. § 292.303(a) (1985). *See also* Rickerson et al., *supra* note 25, at 78. It should be noted, however, that the Energy Policy Act of 2005 has created the possibility for FERC to exempt utilities from their PURPA obligation to purchase the electricity output of renewable energy producers with a nameplate capacity over twenty megawatts if these producers have nondiscriminatory access to competitive markets for the sale of their energy and capacity. *See* 16 U.S.C. § 824a-3(m) (2012).

187. *See* 16 U.S.C. § 824(b)(1) (2012).

188. *See* MENDONÇA ET AL., *supra* note 36, at 28.

distribution, and retail ratemaking authority. For many representatives on Capitol Hill, the risk of sacrificing state regulatory authority will, by itself, be enough to vote against a federal FIT policy. More than two decades of fruitless congressional debate over a federal RPS offer ample proof of the enormous challenges of building support for a strong federal commitment to renewable energy.[189] With their market-based design and their environmental benefits, RPS policies have, at least in theory, the potential to appeal to both Republican libertarianism and Democratic environmentalism. If this bipartisan appeal was not enough to gain congressional approval for RPS bills, building support for a price-based, federal FIT policy will likely be even more difficult. To infuse the clean energy and climate policy debate with the threat to curtail state regulatory authority will make reaching a compromise more challenging still.

2. Tailoring Tariffs to Local Needs

This Article has compared state-level FIT policy to a well-tailored coat because of its snug fit with existing state authorities under the federalist system of electricity regulation. In addition, FIT programs offer plenty of thread to weave in the intricacies of state electricity markets. Sophisticated and tailored FIT design can address the specific opportunities and limitations of a state's existing grid infrastructure, renewable energy resources, and electricity load profile.

America's best renewable energy resources tend to be found in remote deserts (solar) and the midwest's vast plains (wind), often hundreds of miles from the nation's more densely populated load centers. Accordingly, transmission infrastructure or the lack thereof has long been identified as one of the primary obstacles to the large-scale deployment of renewable energy technologies.[190] Struggles over federal versus state siting authority have effectively stalled new transmission projects.[191] State FITs have the potential to provide a partial remedy. Based on local infrastructure, a state can design its FIT program to include special incentives for distributed generation facilities. Unlike remotely sited utility-scale plants, such small-scale renewables facilities, such as solar

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189. *See supra* note 14 and accompanying text.

190. *See, e.g.*, Klass, *supra* note 86, at 1943 (noting that current challenges to the build-out of new interstate transmission infrastructure are creating a situation where "renewable electricity resources, particularly wind, will remain trapped where they are least needed"); FOX-PENNER ET AL., *supra* note 63, at 92; Klass & Wilson, *supra* note 28, at 1873 (describing the development of necessary transmission infrastructure as "a challenge of massive proportions"); Osofsky & Wiseman, *Hybrid Energy Governance*, *supra* note 28, at 791 ("[R]enewable generators also lack access to transmission even when interconnection is theoretically possible, as abundant renewable resources tend to be located in rural areas far from existing transmission lines.").

191. *See* Fershee, *Moving Power Forward*, *supra* note 17, at 1418.

photovoltaics installations on residential or commercial rooftops, often require only minimal upgrades to existing grid infrastructure.[192] Accordingly, distributed generation projects are subject to considerably less regulatory scrutiny and, hence, significantly reduce lead times and overall construction costs compared to utility-scale renewable power plants.[193] Furthermore, distributed generation offers sizeable improvements in energy security, including increased grid reliability and reduced vulnerability to strategic attacks or natural disasters.[194] Finally, locally integrated renewable energy facilities increase awareness of and reduce local reservations to renewable energy projects.[195] Unless implemented as a clean energy floor[196] or with a waiver provision allowing for greater state latitude,[197] a federal FIT would not be as capable of accounting for the subtle differences in grid infrastructure requirements at the state or local level. Moreover, individual states are far better positioned than Capitol Hill to determine how much social value the various benefits of distributed generation add to their local energy economies. As a result, state-level FIT policies are conceptually better suited than a uniform federal FIT to reflect this value in their tariff structures.

By virtue of its multi-tiered, technology-specific tariff structure,[198] FIT policy can be custom-designed to reflect the local availability and value of renewable energy resources. State-level implementation of FIT programs enables local legislators to tailor support for renewables to incentivize those technologies and project types that promise the greatest

192. For an overview of these and other benefits of distributed renewable power generation facilities, see Melissa Powers, *Small Is (Still) Beautiful: Designing U.S. Energy Policies to Increase Localized Renewable Energy Generation*, 30 WIS. INT'L L.J. 595, 622–23 (2012); Garrick B. Pursley & Hannah J. Wiseman, *Local Energy*, 60 EMORY L.J. 877, 897 (2011).

193. *See, e.g.*, KRISTEN ARDANI ET AL, NAT'L RENEWABLE ENERGY LAB., A STATE-LEVEL COMPARISON OF PROCESSES AND TIMELINES FOR DISTRIBUTED PHOTOVOLTAIC INTERCONNECTION IN THE UNITED STATES 6 (2015) ("Generally, larger projects require additional time for utility studies and approvals as well as more time for construction.").

194. For an overview of distributed generation's many energy security benefits, see David M. Sweet, *The Decentralized Energy Paradigm*, *in* ENERGY SECURITY CHALLENGES FOR THE 21ST CENTURY: A REFERENCE HANDBOOK 308 (ABC-CLIO 2009).

195. *See* Mormann, *supra* note 7, at 963.

196. For the time being, judicial interpretation of key energy statutes based on an implied preemption analysis appears to prevent implementation of FIT or related clean energy policy in the form of a clean energy floor. *See* Rossi & Hutton, *supra* note 23, at 1356 (noting that implied preemption analysis appears to have blinded regulators and courts from seeing the virtues of clean energy floors).

197. *See, e.g.*, 42 U.S.C. § 7543(b) (2012) (waiver provision for more restrictive vehicle emissions regulation by qualifying states).

198. *See supra* note 51 and accompanying text.

local benefits to their constituents.[199] Existing state policy support for renewables has demonstrated the ingenuity of state regulators when it comes to harnessing locally available resources, such as Maryland's incentives for power generation from poultry waste.[200]

Moving from local opportunities to challenges, FIT implementation at the state level can consider and address specific challenges to the successful integration of renewables into the local fuel mix. For example, states may choose different regimes for exposing renewables to the electricity market's forecast and balancing obligations[201] in order to reflect the availability and cost of reserve power that can compensate for the output intermittency of weather-dependent wind or solar power generators. States with abundant natural gas turbines, hydroelectric facilities, and other fast-ramping power plants, for instance, may be more willing to exempt renewables from their balancing responsibilities than states that rely on slow-ramping coal or nuclear power to supply the bulk of their load.[202] A uniform federal FIT policy would not be able to account for these and other intricacies.

Finally, state-level FIT programs are better suited than a federally implemented FIT policy to address one of the main criticisms of renewable electricity: the potential mismatch between renewable generators' peak output and the system's peak demand. The utility of electricity generated from wind turbines, for instance, is often questioned based on the annual and daily distribution of their output.[203] Simply stated, the wind tends to blow primarily during the night and more so in

199. For a discussion of the local benefits to be gained from renewable electricity generation, see *supra* notes 105–11 and accompanying text.

200. *See* MD. CODE ANN., PUB. UTILS. § 7-701(r)(9) (West 2015).

201. Electricity is often traded in forward markets where generators offer to supply electricity to the system operator for five-minute intervals on a day-ahead basis. The following day, when the relevant five-minute window opens, the generator has to deliver the promised amount of electricity or else compensate the system operator under their imbalance settlement for balancing services the latter uses to cover for the generator's lack of performance under their contract. The cost of these balancing services varies depending on the time horizon that needs to be balanced—the "replacement reserve" (hours ahead) is cheapest, with rates going up for the "secondary reserve" (minutes ahead) and peaking for the "primary reserve" (seconds ahead). For an overview of forecast and balancing obligations in forward electricity markets, see Corinna Klessmann et al., *Pros and Cons of Exposing Renewables to Electricity Market Risks – A Comparison of the Market Integration Approaches in Germany, Spain, and the UK*, 36 ENERGY POL'Y 3646, 3647 (2008).

202. For an overview of the ramping, *i.e.*, balancing capabilities of different power generation technologies, see FOX-PENNER ET AL., *supra* note 63, at 96–112.

203. *See, e.g.*, RYAN WISER & MARK BOLINGER, U.S. DEP'T OF ENERGY, 2009 WIND TECHNOLOGIES MARKET REPORT 50 (2010) (describing the Texas ERCOT experience with wind electricity output).

winter than summer.[204] In the absence of economic grid-level energy storage, wind electricity is rarely available to meet peak demand resulting from mid-day air-conditioning operations in the summer months. In states with hot summers and relatively mild winters, such as Texas, wind electricity may therefore be less valuable than, for example, in Minnesota, where more electricity is used for heating than cooling and load profiles tend to be more balanced throughout the day and year.[205] Conversely, Minnesota may have less appreciation for solar electricity that will not be available to meet electricity demand for nighttime electric heating. A Texas FIT, therefore, could be tailored to incentivize greater deployment of solar power while a Minnesota FIT might place greater emphasis on the continued build-out of wind energy.[206] More generally, state-implemented FIT policy can reflect and reward the social value of electricity from specific sources and technologies to establish the mix of renewable resources that best meets local demand.

III. THE BEST OF BOTH WORLDS: INTEGRATING RENEWABLE PORTFOLIO STANDARDS AND FEED-IN TARIFFS

Contrary to the literature's traditional view, this Article does not regard FIT and RPS policies as mutually exclusive and, instead, argues that both can, and should, be integrated for better allocation of investor and regulatory risk and to harness interstate competition as a catalyst for technology innovation. With aggregate risk mitigation greater than the subtotal of its parts, an integrated RPS–FIT regime would require lower returns to leverage higher private-sector investment in renewables while ensuring sustainable growth in clean energy deployment.

The energy policy literature has historically viewed RPS policies as an American phenomenon and FIT policies as a European

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204. *See* KATIE COUGHLIN & JOSEPH H. ETO, ERNEST ORLANDO LAWRENCE BERKELEY NAT'L LAB., ANALYSIS OF WIND POWER AND LOAD DATA AT MULTIPLE TIMES 11, 17 (2010), *available at* http://www.ferc.gov/industries/electric/indus-act/reliability/analysiswindpowerload.pdf.

205. *See, e.g.*, U.S. ENERGY INFO. ADMIN., *Form EIA-826 Detailed Data*, *available at* http://www.eia.gov/electricity/data/eia826/ (last visited Sept. 22, 2015).

206. In reality, the only places to achieve significant solar photovoltaic deployment in Texas to date—Austin and San Antonio—have both done so using solar-specific FITs or similarly tailored programs. *See* Mormann et al, *supra* note 145. In Minnesota, the state RPS along with federal tax incentives has proven a strong driver of wind energy deployment while a recently adopted FIT-esque value-of-solar tariff adopted seeks to provide tailored support for distributed solar power generation assets based on their specific contribution to Minnesota's energy economy. *See In re* Establishing a Distributed Solar Value Methodology Under Minn. Stat. § 216B.164, subd. 10 (e) & (f), E-999/M-14-65 (Minn. Pub. Utils. Comm'n Apr. 1, 2014), *available at* https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7bFC0357B5-FBE2-4E99-9E3B-5CCFCF48F822%7d&documentTitle=20144-97879-01.

phenomenon.[207] As a result, few commentators and even fewer policy makers have considered the joint implementation of both policies.[208] RPS and FIT policies are not mutually exclusive, however, but rather have the potential to work "hand-in-glove."[209] Empirical evidence[210] and qualitative analysis[211] suggest that FITs are more effective and more efficient than RECs at delivering public policy support to renewable power projects. RPS targets can create markets for renewable energy, but FIT policies have proven more successful at delivering the necessary support to populate these markets.[212] In recognition of this synergetic

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207. *See, e.g.*, Davies, *Reconciling RPSs and FITs*, *supra* note 18, at 313 ("Historically, feed-in tariffs have dominated in Europe. . . . Jurisdictions in the United States overwhelmingly have gravitated toward the RPS . . . .").

208. *See, e.g.*, Ringel, *supra* note 9, at 1 ("Feed-in tariffs on the one side and green certificates on the other side seem promising tools to foster renewable energies. . . . Whether feed-in tariffs or—more likely—green certificates will be chosen is only a first, generic decision"); Davies, *Reconciling RPSs and FITs*, *supra* note 18, at 313 (reporting that, between FIT and RPS policies, "states traditionally have chosen one tool or the other"); Shum & Watanabe, *supra* note 25, at 3267 ("Different governments have attempted to use a price [FIT] vs. quantity approach [RPS] for renewable deployment."). For a critique of these suggestions, see Rickerson et al., *supra* note 25, at 76–78.

209. *See, e.g.*, Davies, *Incentivizing Renewable Energy Deployment*, *supra* note 18, at 83; Davies, *Reconciling RPSs and FITs*, *supra* note 18, at 313 (questioning "the customary logic on renewable energy policy design" by asking "whether renewable portfolio standards and feed-in tariffs really must be mutually exclusive paths to a more sustainable energy future").

210. *See, e.g.*, INT'L ENERGY AGENCY, DEPLOYING RENEWABLES—BEST AND FUTURE POLICY PRACTICE 130 (2011) [hereinafter INT'L ENERGY AGENCY, BEST AND FUTURE POLICY PRACTICE], *available at* http://www.iea.org/publications/freepublications/publication/Deploying_Renewables2011.pdf (observing a "general trend" of FIT policies performing more cost-efficiently than RPS policies); INT'L ENERGY AGENCY, DEPLOYING RENEWABLES – PRINCIPLES FOR EFFECTIVE POLICIES 101 (2008), *available at* https://www.iea.org/publications/freepublications/publication/DeployingRenewables2008.pdf (noting in a global comparison that the most effective FIT policies delivered significantly greater deployment than the most effective RPS policies); *see also* JOHN FARRELL, INST. FOR LOCAL SELF-RELIANCE, CLEAN V SRECS: FINDING THE MORE COST-EFFECTIVE SOLAR POLICY 27 (2011), *available at* http://ilsr.org/clean-v-srecs-finding-more-cost-effective-solar-policy/ (warning that New Jersey's ratepayers must pay up to 83% more for solar electricity under the state's RPS than they would have to under a FIT policy).

211. *See* Felix Mormann, *Enhancing the Investor Appeal of Renewable Energy*, 42 ENVTL. L. 681, 723 (2012).

212. One key reason why FIT policies have proven more successful is their greater investor appeal. Even large banks, insurance companies, and other professional investors with the necessary financial acumen refuse to plan with revenue from REC sales. *See, e.g.*, RICHARD CARRELL, PRUDENTIAL CAPITAL GRP., PRESENTATION AT 2014 AUSTIN ELECTRICITY CONFERENCE 11, *available at* http://www.mccombs.utexas.edu/~/media/Files/MSB/Centers/EMIC/Events/Conferences/AEC%20presentations%202014/AEC%202014%20Participants/Carrell.pdf (noting the difficulty to bank REC revenue); *see also* Gireesh Shrimali et al., *Wind Energy Deployment in the U.S.: An Empirical Analysis of the Role of Federal and State Policies*, 43 RENEWABLE & SUSTAINABLE ENERGY REVS. 796, 805 (2014) (reporting how direct federal support in form of the wind production tax credit makes state-level RPS programs effective).

relationship, California, Hawaii, Maine, Oregon, Rhode Island, Vermont, and Washington have already begun to use FIT programs to finance renewable project development to reach their respective RPS targets.[213]

This Part proposes a novel model for closer integration of RPS and FIT policies[214] to combine RPS mitigation of regulatory risk with FIT mitigation of market, off-take, and other investor risk.[215] Properly designed and implemented, an integrated RPS–FIT regime can harness the competitive market forces inherent in RPS policies and redirect them to optimize overall risk allocation.[216] In interstate competition, the integration of existing state RPS programs or a future federal RPS with state-level FIT programs could drive a veritable race to the top as states compete to place first nationally in the global clean energy race.[217] Importantly, the proposed model can accommodate both the existing policy landscape of multiple state RPSs supplemented, in some states, by FIT programs and a possible future policy landscape with a federal RPS complemented by multiple state-level FIT policies, as recommended based on this Article's inquiry into the ideal institutional level for implementing RPS and FIT policies.

A. *Market vs. Regulation: Two Approaches to Risk Mitigation*

The principal objective of every policy for the build-out of clean energy infrastructure is to leverage private-sector investment and to do so as cost-effectively as possible. As with any investment opportunity, the investor appeal of renewable energy assets hinges on the trade-off between anticipated risks and returns.[218] In theory, policy makers could simply offer unusually high, above-market returns to incentivize private investment in renewables. To do so, however, would ignore the need for cost-effective policy design and would impose a significant burden on taxpayers and/or ratepayers. Moreover, empirical evidence suggests that targeted risk mitigation and re-allocation measures may be a more effective and efficient policy lever to incentivize private-sector

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213. *See supra* note 14 and accompanying text.

214. This section builds on Felix Mormann, *Re-Allocating Risk: The Case for Closer Integration of Price- and Quantity-Based Support Policies for Clean Energy*, ELECTRICITY J., Nov. 2014, at 9.

215. *Infra* Section III.A.

216. *Infra* Section III.B.

217. *Infra* Section III.C.

218. For an introduction to the risk-and-return reasoning of debt and other investors regarding renewable energy projects, see DAVID FELDMAN & EDWARD SETTLE, NAT'L RENEWABLE ENERGY LAB., MASTER LIMITED PARTNERSHIPS AND REAL ESTATE INVESTMENT TRUSTS 22–23 (2013); UDAY VARADARAJAN ET AL., CLIMATE POLICY INITIATIVE, THE IMPACTS OF POLICY ON THE FINANCING OF RENEWABLE PROJECTS 3–6 (2011).

investment in clean energy deployment.[219] According to one study based on IEA data from thirty-five countries around the globe, FIT policies that effectively mitigate off-take and other critical market risks for investors encourage up to four times as much clean energy deployment as quantity-based RPS policies—despite offering only half the returns to investors.[220] Mitigation of one type of risk, however, often comes at the expense of re-allocating, and possibly exacerbating, another type of risk. RPS and FIT policies both seek to reduce the overall risks associated with the large-scale build-out of renewable energy infrastructure, but each policy's mitigation strategy prioritizes a different type of risk.

FIT policy design appears to be driven primarily by the objective to mitigate and, where possible, minimize investor risk so as to drive down the returns necessary to leverage private-sector investment. FITs achieve this extensive mitigation of investor risk at the cost of increased regulatory risk borne by ratepayers or by clean energy developers and investors, depending upon which side regulators err on when setting FIT rates and other critical policy parameter.[221] In contrast, RPS policy design prioritizes regulatory risk over investor risk. Reliance on markets to determine the appropriate level of support for clean energy deployment relieves regulators of the obligation to set prices and other policy parameters, beyond the RPS mandate itself. Reliance on not just one but two distinct markets, however, significantly increases off-take and other market-related risks to clean energy developers and investors.[222]

1. Feed-In Tariffs and Investor Risk Mitigation

Price-based FIT programs are commonly praised for the investment certainty they provide.[223] By requiring utilities and/or network operators to enter into long-term power purchase agreements (PPAs) at guaranteed, above-market rates to cover costs and offer reasonable returns on investment, FITs free eligible clean energy developers and investors from the need to sell their output on the open market. Rather than trading with unknown counterparts at rates determined by the invisible hand of fluctuating wholesale electricity markets, FIT-eligible generators are guaranteed both a lucrative sales price for their product and a creditworthy, well-funded off-taker, such as a rate-regulated utility company. In addition, many FIT regimes exempt eligible clean energy facilities from the forecast and balancing responsibilities imposed on

219. *See supra* note 210.
220. *See* Mormann, *supra* note 211, at 703.
221. *Infra Subsection* III.A.1.
222. *Infra Subsection* III.A.2.
223. *See, e.g.*, Butler & Neuhoff, *supra* note 48; FARRELL, *supra* note 210.

other generators in order to safeguard the electricity grid's delicate moment-to-moment equilibrium between supply and demand.[224] The intended effect of these FIT characteristics is the minimization of off-take and other market risks for clean energy projects. This risk-reducing approach is informed by the conventional wisdom that lower risks justify lower returns and, thereby, improve the cost efficiency of clean energy policy. The highly positive attitude of investors and developers toward FIT policies, observed in several independent surveys, suggests that this mitigation of off-take and other market risks addresses real needs.[225]

The FIT approach to mitigating these risks, however, does not altogether eliminate the risks inherent in renewable energy deployment but, rather, re-allocates them. The certainty that market-independent prices afford to clean energy developers and investors comes at the cost of considerable regulatory risk. It is the regulator's responsibility to determine which FIT rate will allow eligible facilities to recoup their costs and earn reasonable returns on investment. A tariff set too low will fail to attract the necessary investment to deploy clean energy as the Argentinian FIT experience illustrates. As a concession to political opposition, Argentina's 2006 FIT for wind energy was set too low to inspire serious investment, leaving deployed wind capacity stable at only thirty megawatts nationwide—the equivalent of fifteen present-day onshore wind turbines.[226] Closer to home, the city of Palo Alto, California is experiencing similar issues with its solar FIT that has failed to inspire any deployment since its adoption in 2012.[227]

FIT rates set too high are equally problematic, offering windfall benefits to clean energy developers and investors while imposing undue hardship on electricity ratepayers, both of which may ultimately undermine public support for renewables as evidenced by Spain's original solar FIT program. The Spanish regulators chose to adopt rates similar to those of Germany's widely praised FIT only to find out that, in real terms, these rates were far too high in light of Spain's 60% greater

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224. *See* Klessmann et al., *supra* note 201, at 3647.

225. *See, e.g.*, Mary Jean Bürer & Rolf Wüstenhagen, *Which Renewable Energy Policy is a Venture Capitalist's Best Friend? Empirical Evidence from a Survey of International Cleantech Investors*, 37 ENERGY POL'Y 4997 (2009); Sonja Lüthi & Thomas Prässler, *Analyzing Policy Support Instruments and Regulatory Risk Factors for Wind Energy Deployment – a Developers' Perspective*, 39 ENERGY POL'Y 4876 (2011).

226. *See* MENDONÇA ET AL., *supra* note 36, at 57.

227. *See Utilities CLEAN (FIT) Program—City of Palo Alto*, CITY OF PALO ALTO, http://www.cityofpaloalto.org/gov/depts/utl/business/sustainability/clean.asp (last visited Sept. 22, 2015) (noting "No applications in process" for the three megawatts of FIT-eligible solar capacity available).

insolation compared to Germany.[228] As a result, the Spanish FIT offered renewable energy investors windfall profits at the expense of taxpayers, eroding public support for solar energy and eventually forcing Spain's government to suspend its FIT program.[229] As these examples illustrate, both ratepayers/taxpayers and developers/investors may suffer from exposure to the regulatory risk associated with FIT policy—depending on which side the regulator errs on setting the FIT rates.

This underlying regulatory risk is compounded by the fact that most FIT policies set multiple rates to account for different technologies, project sizes, and other factors. Moreover, growth in deployed capacity fosters technology learning that drives down generation costs and gradually moves clean energy technologies closer to grid parity.[230] Along the way, these cost improvements require constant monitoring and modification of FIT rates to keep investor returns reasonable and avoid windfall from tariffs that, say, fail to fall along with tumbling prices for solar panels. Otherwise, a FIT program that started out with appropriate rates may eventually become the victim of its own success and, in the process, deliver greater and faster deployment than ratepayers are willing to fund or the electricity grid may be able to absorb.[231]

2. Renewable Portfolio Standards and Regulatory Risk Mitigation

RPS policies are frequently hailed as modern, market-based instruments to promote the build-out of clean energy infrastructure. This market reliance shapes the mitigation and allocation of risks under RPS regimes providing, among others, for significantly lower regulatory risk

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228. *See* MENDONÇA ET AL., *supra* note 36, at 59.

229. *See The Government Will Temporarily Suspend Premiums for New Special Regime Facilities*, GOBIERNO DE ESPAÑA (Jan. 27, 2012), http://www.minetur.gob.es/en-US/GabinetePrensa/NotasPrensa/2012/Paginas/npregimenespecial270112.aspx; *see also The Cost del Sol*, ECONOMIST (July 20, 2013), http://www.economist.com/news/business/21582018-sustainable-energy-meets-unsustainable-costs-cost-del-sol.

230. *See, e.g.*, PATRICK HEARPS & DYLAN MCCONNELL, MELBOURNE ENERGY INST., RENEWABLE ENERGY TECHNOLOGY COST REVIEW (2011), *available at* http://www.garnautreview.org.au/update-2011/commissioned-work/renewable-energy-technology-cost-review.pdf.

231. *See* Davies & Allen, *supra* note 18, at 997 ("Indeed, the paradox inherent in feed-in tariffs is that they are designed to gradually self-destruct."). It should be noted that sophisticated FIT design aims to address some of these risks. Germany's FIT program, for instance, uses standard degression rates that anticipate cost reductions from technogy learning to provide for annual reductions of FIT rates without the need for regulatory action, *see id.* at 949. California recently revised its FIT program to include a renewable market adjusting tariff (ReMAT) mechanism that automatically adjusts FIT rates based on the program's deployment success, lowering rates for higher-than expected deployment and increasing rates if deployment is lower than expected. For details on California's revised FIT program, see Decision Revising Feed-In Tariff Program, Rulemaking 11-05-005 (Pub. Util. Comm'n of the State of Cal. May 31, 2012), *available at* http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/167679.pdf.

than FIT policies. While FITs task regulators with setting the appropriate rates for clean electricity, RPSs rely on the market's invisible hand to determine the price of RECs intended to reward eligible generators for their commitment to clean, renewable sources of energy.[232] Once the regulator's RPS sourcing mandate has created a market for clean electricity and associated RECs, the clearing price for RECs in this market is expected to follow the basic rules of demand and supply. Presumably, buyers and sellers in this market possess greater knowledge of and experience with clean energy than regulators, suggesting that the former are in a better position to accurately assess the market value of clean electricity embodied in RECs.

If clearing prices for REC trading turn out to be higher than expected, perhaps offering oligopoly rents as the result of supply constraints, economic theory suggests that new suppliers will enter the market eventually driving down the REC clearing price to competitive rent levels. Conversely, unexpectedly low trading prices for RECs would discourage market entry and eventually require utilities to bid higher in order to procure the RECs they need to comply with the RPS sourcing mandate. The market reliance of RPS programs, therefore, is designed to mitigate the risks associated with the regulator's failure to appropriately price the cost and value of clean electricity. Market forces are expected to provide automatic adjustments to technology learning, cost improvements, and other factors that shape the value of clean electricity. Once again, RPS regulators prefer to trust the judgment of market participants rather than their own.

RPS policies not only mitigate the risk that regulators may set incentives for clean energy too high or too low, or that they may fail to adjust them to reflect technology innovation. They also mitigate the risks associated with the integration of wind, solar, and other intermittent clean energy sources into existing electricity grids. When regulators impose RPS sourcing requirements, they create new markets and, at the same time, limit the size of these markets. RPS mandates serve as both goals and caps to renewable energy deployment as deployed and planned capacity approaches the RPS target.[233] Together with the gradual ramp-

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232. *See, e.g.*, Trent Berry & Mark Jaccard, *The Renewable Portfolio Standard: Design Considerations and an Implementation Survey*, 29 ENERGY POL'Y 263 (2001); Karlynn S. Cory & Blair G. Swezey, *Renewable Portfolio Standards in the States: Balancing Goals and Rules*, ELECTRICITY J., May 2007, at 21.

233. *See* Mormann, *supra* note 211, at 712 (describing the "inherent cap in the capacity targets set by RPS regimes"); *see also Does RPS Still Gun the Engines*, RENEWABLE ENERGY PROJECT FIN. (Nov. 7, 2012 10:00 AM), https://financere.nrel.gov/finance/content/does-rps-still-gun-engines (questioning the capacity of state RPS programs to drive deployment as achievement of the RPS target draws nearer).

up over several years mandated by most RPS programs, the simultaneous creation and limitation of clean energy markets helps regulators and, critically, network operators anticipate growth in order to ensure the grid's ability to absorb a growing share of intermittent renewable power generators.

Of course, the ability of market-based RPS policies to effectively mitigate these regulatory risks depends on the regulator's success at creating and maintaining viable markets that function as reliable conduits of information, including but not limited to market pricing.[234] Moreover, RPS-induced mitigation of the underlying regulatory risk comes at the cost of greater risk to investors compared to FITs. RPSs rely on not one but two distinct markets—the wholesale electricity market and the REC trading market—to deliver the necessary remuneration to promote renewables deployment.[235]

As a result, clean energy developers and investors find themselves exposed to the price risk of two distinct markets with each following its own set of rules. Day-ahead trading in wholesale electricity markets, for instance, may require intermittent solar or wind generators to bid for capacity they may prove unable to supply when called upon.[236] Similarly, fragmented and often illiquid REC trading markets may expose clean energy generators to extreme volatility as illustrated by geographic price fluctuations ranging from $1.75 in California to $35 in New England for a REC over 1 MWh of wind energy[237] and temporal price fluctuations from $40 down to nearly $6 for 1 MWh worth of Connecticut RECs within a one-year period.[238] Sophisticated RPS design can suggest an upper bound for REC trading prices by setting the penalty that utilities must pay for every REC they should—but fail to—procure.[239] This "buy-out" price may set a price ceiling but it does not establish a price floor. Consequently, a renewable power investor's revenue from REC sales is left to fluctuate according to the market's invisible hand, with regulatory limitations on its upside potential but not on its downside potential.

The RPS-imposed need for clean energy generators to trade on two separate markets not only increases their overall market risk exposure but, importantly, also drives up their transaction costs. In contrast to a

234. For a critique of the liquidity and volatility issues of fragmented state-level REC markets, see *supra* Subsection II.A.2.b.

235. *See* Mormann, *supra* note 211, at 712.

236. *See* Klessmann et al., *supra* note 201.

237. *See* Sovacool & Cooper, *Congress Got it Wrong*, *supra* note 17.

238. *See* Ryan Wiser et al., *The Experience with Renewable Portfolio Standards in the United States*, ELECTRICITY J., May 2007, at 8, 16.

239. *See* Klessmann et al., *supra* note 201, at 3653 (discussing the example of the United Kingdom's Renewables Obligation).

FIT, an RPS requires electricity generators that rely on renewables to negotiate and execute one or multiple PPAs to sell their electricity output.[240] Unless these PPAs include the transfer of associated RECs, generators also need to budget for navigating volatile REC markets. Together, these transaction costs have led to the characterization of RPSs as "big corporation policies" with "neutral or negative effects on smaller, entrepreneurial firms."[241] Finally, RPS policies may require clean energy developers and investors to deal with buyers—for both their power output and RECs—of lower creditworthiness than electric utilities thereby increasing the overall off-take risk.

The dominant criticism of RPS and FIT policies supports the preceding observations. Critics commonly blame deficits in the observed cost efficiency of RPSs compared to FITs and other deployment policies on the greater investor risk under an RPS, which, in turn, requires higher returns.[242] Opponents of FIT support for clean, renewable energy, meanwhile, draw on examples of regulatory failures to set and maintain FIT rates at appropriate levels to make their case.[243] The allocation and mitigation of risk under RPS and FIT policies appear to be two sides of the same coin. Much in the spirit of a zero-sum game, each policy appears to ultimately pay the price for its respective risk treatment choices. The following sections explore the possibility of integrating FIT and RPS policies to combine their comparative strengths and mitigate their respective weaknesses—for a subtotal that may be greater than the sum of its parts.

B. *Re-Allocating Risk: The Cost-Neutral Default*

The main challenge for successfully integrating state FIT policies with the American panoply of state RPSs (or a future federal RPS) is how to treat the ownership and transfer of RECs. FERC has noted that "[w]hile a state may decide that a sale of power at wholesale automatically transfers ownership of the state-created RECs, that requirement must find its authority in state law."[244] In the absence of such a clear legislative mandate, however, state courts have varied considerably in their

240. *See* Mormann, *supra* note 211, at 713.

241. Bürer & Wüstenhagen, *supra* note 225, at 5005.

242. *See, e.g.*, INT'L ENERGY AGENCY, BEST AND FUTURE POLICY PRACTICE, *supra* note 210, at 131 ("[REC] certificate prices include many risk factors that are not a genuine property of RE technologies per se.").

243. *See, e.g.*, *id.* at 81 (discussing the challenges of fixed FIT rates to keep up with rapidly falling solar photovoltaic (PV) module prices).

244. American Ref-Fuel Co., Covanta Energy Grp., Montenay Power Corp., and Wheelabrator Techs. Inc., 105 FERC ¶ 61,004, 61,005 (2003), *reh'g denied* 107 FERC ¶ 61,016 (2004).

treatment of REC ownership and transfer.[245] Some have simply included RECs in contracts for the sale of electricity even when these contracts predated that state's adoption of an RPS.[246] Others have refused to include RECs in "purchased power," suggesting that RECs would need to be transferred independently from the power output for which they were originally awarded.[247] If renewable power generators are allowed to both keep their RECs and receive FIT payments, it may create windfall benefits. Under this latter regime, utilities would have to purchase renewable power at the above-market FIT rate *and* pay a second premium to buy the RECs necessary to prove compliance with their RPS sourcing obligations. Integration of a state FIT with a state (or federal) RPS, therefore, should condition tariff payments on the transfer of REC ownership to the local utility company in exchange for its tariff payments. Simply speaking, a utility's FIT payments to renewable generators should buy both the electricity and the associated RECs.

If the utility uses the RECs to prove compliance with its state (or a future regional/federal) RPS, the outcome is similar to that under an RPS without FIT support. Used RECs will be voided to prevent double counting and the utility recovers the cost of its RPS compliance from its ratepayers through including it in its retail electricity rates. The crucial difference between the isolated RPS scenario and the integrated RPS–FIT model lies in the investment certainty and market risk mitigation that the tariff affords renewable energy project developers and financiers.[248] But the synergy effects of an integrated RPS–FIT regime also benefit the utilities and their ratepayers. Improvements in investment certainty from long-term FIT payments translate to greater planning certainty and lower financing charges, thereby driving down the RPS compliance costs of electric utilities. When FIT payments purchase both electricity and RECs, a utility's RPS compliance costs no longer depend on the substantial price fluctuations of wholesale power markets and volatile REC markets.[249] Compared to the RPS-only scenario's need for utilities to acquire electricity and RECs through trades on two separate markets, the integrated RPS–FIT scenario significantly reduces a utility's overall transaction costs. Given the ability of utilities to incorporate their RPS compliance costs into their electricity rates, these cost savings ultimately

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245. For an account of the disparate judicial treatment of REC ownership and transfer, see Fershee, *Moving Power Forward*, *supra* note 17, at 1410–15.

246. *See* Wheelabrator Lisbon, Inc. v. Dep't of Pub. Util. Control, 931 A.2d 159, 174 n.23 (Conn. 2007) (reporting inclusive treatment of RECs for at least nine states).

247. *See* N.M. Indus. Energy Consumers v. N.M. Pub. Regulation Comm'n, 168 P.3d 105, 116 (N.M. 2007).

248. *See* MORMANN, *supra* note 211, at 712–13 (comparing the investment certainty offered by RPS and FIT policies, noting that "feed-in tariffs offer the highest overall level of certainty to investors in renewable energy technologies").

249. *Supra* Subsection II.A.2.b.

pass on to ratepayers in the form of lower electricity bills. Figure 1 illustrates the flow of electricity, revenue, and RECs in the cost-neutral, default scenario.

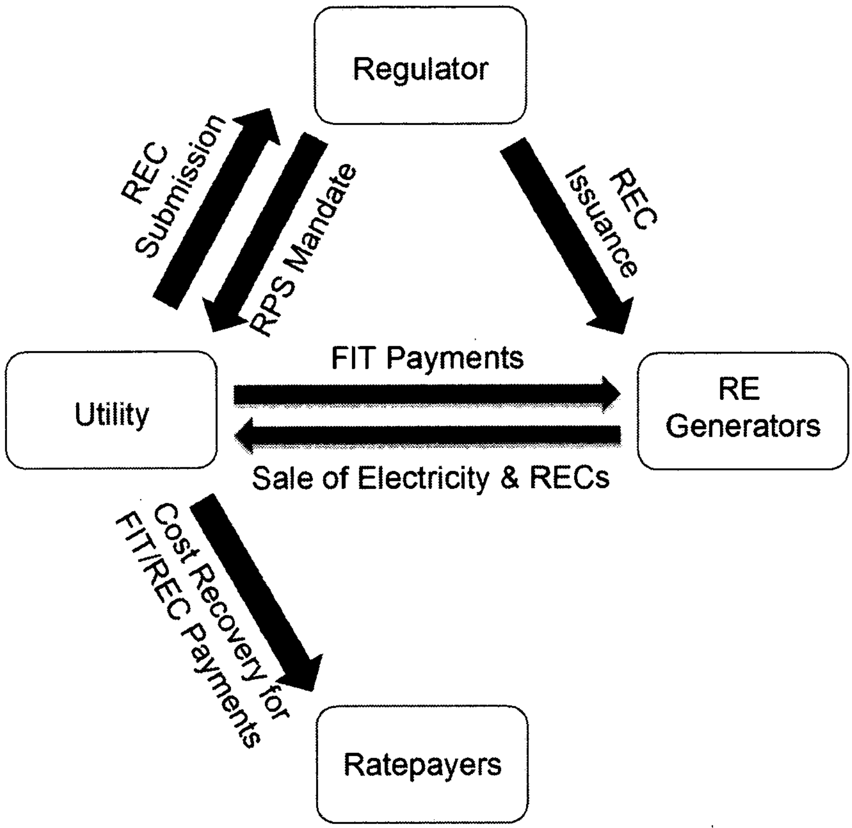

Figure 1: Flow of Electricity, Revenue, and RECs in Joint RPS–FIT Regime[250]

C. *Re-Allocating Risk: The Profit-Oriented Option*

To realize their full potential, integrated RPS–FIT programs can foster interstate competition over renewable energy deployment. To this end, regulators ought to give electric utilities a choice of how to treat the RECs they receive in exchange for their tariff payments. By default, utilities can continue to recoup the cost of FIT payments by passing them on to their ratepayers and, thus, make their RPS compliance relatively cost-neutral, as illustrated above.[251] As an alternative to this cost-neutral option, utilities should be allowed (and encouraged) to choose a second, profit-

250. Mormann, *supra* note 214, at 16.

251. This is the situation under most existing RPS mandates that allow utilities to pass their compliance costs on to their ratepayers, for example, in the form of a fuel surcharge. *See, e.g.*, Fershee, *Moving Power Forward*, *supra* note 17, at 1413 (noting how New Mexico recovers certain costs through an "adjustment clause").

oriented option where, rather than simply using all their RECs for RPS compliance, utilities can sell some of their RECs to other in-state utilities, out-of-state utilities and other buyers to make a profit. As in the cost-neutral default scenario, the utilities would still need to pay renewable power generators the guaranteed FIT rates. Under the profit-oriented option, however, the utility trades all or part of its ability to recover the cost of these FIT payments from its ratepayers for the opportunity to recoup the cost of its RPS compliance on the open market *and* make a profit in the process. This option will be particularly interesting where state FIT programs deliver so much deployment that they effectively require utilities to purchase more renewable power and, hence, buy more RECs than they need for compliance with their local RPS mandate.

The critical difference between the profit-oriented option available under an integrated RPS–FIT regime and the cost-neutral default lies in the allocation of risk. Renewable energy investors and project developers are wary of REC-related risk, especially where it exposes them to volatile and unfamiliar REC markets.[252] Electric utility companies, in turn, have substantial experience with these types of markets[253] and possess the resources and expertise to navigate them successfully. As a result, utilities are better bearers of REC-related risk than renewable energy developers or investors.

Innovative retail rate regulation can incentivize electric utilities to assume REC risk, e.g., by allowing utilities to keep a share of their trading gains. The remainder of these gains is passed on to ratepayers, offering an additional option to refinance state FIT programs. Such profit-sharing arrangements are not entirely novel and, in fact, continue to gain importance in the context of energy efficiency initiatives, where state regulators allow their utility companies to keep part of the savings resulting from reduced electricity consumption.[254] Properly designed, these profit-sharing arrangements can provide additional incentives for the cost-effective design and administration of state FIT policy. The greater the deployment success of a state's FIT program, the more RECs its utilities will have at their disposal to trade for market profits. As new, independently owned, renewable energy assets gradually displace utility-owned, conventional energy assets, utilities and regulators become increasingly concerned over the long-term viability of today's utility

252. *See* Bürer & Wüstenhagen, *supra* note 225, at 5005; Lüthi & Prässler, *supra* note 225, at 4889–90.

253. In many ways, REC markets resemble the markets for SO_2 allowances created more than twenty years ago under the Clean Air Act's acid-rain trading scheme. *See* 42 U.S.C. §§ 7651–7651*o*.

254. For a detailed discussion of profit-sharing arrangements and decoupling in the context of energy efficiency, see FOX-PENNER ET AL., *supra* note 63, at 182–84.

business model.[255] The profit-oriented approach enables utilities and their shareholders to earn a profit even as they produce and sell less of their own electricity, helping prepare them for the next generation of utility business models.

The more cost-efficiently a FIT leverages deployment of renewable power assets, the greater the profit margin from REC sales will be for utilities and their shareholders. If innovative State *A* manages to design and implement a particularly effective yet cost-efficient, integrated RPS–FIT regime, then its utilities can export their RECs to other RPS states, such as State *B*, in order to increase State *A*'s profits and, in the process, lower the overall cost to ratepayers of its public policy support for clean energy deployment and climate change mitigation.[256] Conversely, a FIT that proves ineffective (such as that of Palo Alto) or inefficient (such as Spain's original solar FIT) would diminish, if not altogether eliminate, the utilities' ability to sell their RECs for a profit. These dynamics can provide powerful incentives for utilities to not only implement but also help improve local FIT policies because greater efficacy and efficiency translate to greater profits for the utility. In the context of interstate competition, integrated RPS–FIT regimes can provide powerful financial incentives for utilities to operate in and, hence, help create a renewable energy policy environment that outperforms other states and their REC markets. Figure 2 illustrates the flow of revenue and RECs in the profit-oriented, interstate competition scenario.

255. *Id.*; Elisabeth Graffy & Steven Kihm, *Does Disruptive Competition Mean a Death Spiral for Electric Utilities?*, 35 ENERGY L.J. 1, 30–34 (2014) (discussing the threat that increasing solar PV deployment poses to the traditional utility business model). *See also* CALIFORNIA ISO, WHAT THE DUCK CURVE TELLS US ABOUT MANAGING A GREEN GRID (2013), *available at* http://www.caiso.com/documents/flexibleresourceshelprenewables_fastfacts.pdf.

256. In fact, similar dynamics may also be present at a regional, intra-state level. Consider the example of Utilities *A*, *B*, and *C* that all operate within the same state and under the same RPS. Thanks to, say, streamlined permitting and interconnection processes, Utility *A* is more effective and efficient in its implementation of the state-wide (or its local) FIT program than Utilities *B* and *C*. *A*, therefore, acquires more RECs than *B* and *C* while paying less for them. As a result, Utility *A* will likely be able to sell its surplus RECs at a profit to Utilities *B* and *C*.

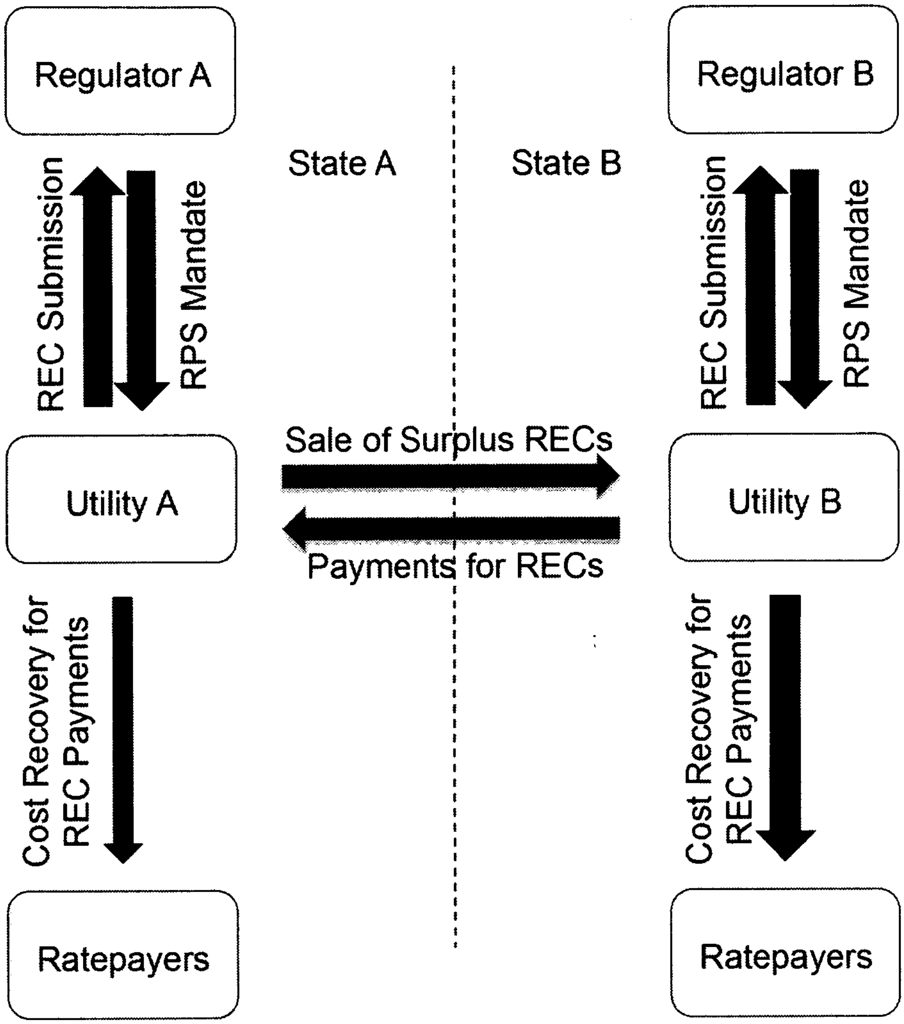

Figure 2: Flow of Revenue and RECs in Joint RPS–FIT Regime with Interstate Competition[257]

By giving utilities a meaningful, potentially profit-bearing stake in the successful deployment of independently owned and operated renewable energy assets, integrated RPS–FIT regimes effectively enlist the utility industry to help optimize clean energy policy. The resulting collaboration between regulators and utilities reallocates and thereby helps mitigate the regulatory risk that often taints standalone FIT programs relying on regulators to set and maintain appropriate rates, interconnection requirements, and other parameters for the quickly evolving, complex renewable energy industry with limited, if any, help from utility experts.

257. Mormann, *supra* note 214, at 17.

From a risk allocation and mitigation perspective, the integrated RPS–FIT model combines the best of both worlds. FIT policy provides critical mitigation of off-take and other market risk for renewable energy project developers and investors. At the same time, FIT programs offer utilities a cost-neutral way of complying with state or federal RPS mandates and reduce the utilities' transaction costs and REC market risk. The existence of viable REC markets, meanwhile, provides crucial benchmarking for the proper determination of FIT rates thereby reducing the regulatory risk that commonly plagues FITs. In addition, integrated RPS–FIT regimes can harness the competitive market forces inherent in RPS policies and redirect them to ensure optimal risk allocation. In interstate competition, these forces can reduce the cost to ratepayers of FIT programs and RPS compliance while driving sustainable deployment of clean energy technologies. This section draws on the U.S. electricity market to make the case for integration of RPS and FIT policies.[258] The underlying risk allocation dynamics and the resulting policy recommendations, however, could, with some modifications, be applied to other jurisdictions with a similarly federal(-esque) system of electricity market regulation and governance, such as China, India, and the European Union, among others.[259]

IV. CONCEPTUALIZING CLEAN ENERGY FEDERALISM

The preceding inquiry into the institutional questions surrounding RPS and FIT policy implementation and the proposed model for an integrated RPS–FIT regime yield valuable insights for the emerging literature on clean energy federalism and its import for the theories that shape today's discourse on environmental federalism and policy.

At a glance, the finding that FITs promise greater clean energy deployment and more effective climate change mitigation if implemented by the states rather than the federal government appears to call into question the matching principle's tenet that the geographic scale of pollution should determine the appropriate institutional level for addressing that pollution. After all, pollution from the power sector's greenhouse gas emissions manifests itself at a global scale. Accordingly, scale matching would appear to suggest that the locus of FIT implementation and related policy action should be the national, if not the

258. It should be noted that implementation of the proposed, integrated RPS–FIT model would raise a range of intriguing questions related to federalism and electricity market regulation (among others) that lie beyond the scope of this Article and are the subject of future research.

259. This Article focuses on the U.S. model of federalism. Internationally, federally structured countries come in a variety of different flavors, some with weaker central governments (e.g., Canada, Switzerland), others with stronger central governments (e.g., Russia), requiring a differential treatment that lies beyond the scope of this Article.

international forum. Closer scrutiny, however, reveals that this Article's recommendation for global climate change mitigation through state-level FITs can, in fact, be reconciled with a more nuanced application of the matching principle, one that acknowledges the multiplicity of environmental and economic factors implicated by pollution and abatement policy.[260]

The suggestion that RPS policy best be implemented at the federal level should be well received by proponents of the traditional public choice narrative who, through much of the twentieth century, cited agency capture and other distortions from well organized, cohesive industry groups as a major obstacle to effective policymaking at the sub-federal level, especially in the environmental law arena. More recent accounts of public choice theory, however, point to similar risks of agency capture at the federal level and posit that the national aggregation of diverse environmental interests can jeopardize their homogeneity and thereby exacerbate organizational problems. Accordingly, neither the federal nor the sub-federal forum should *a priori* be deemed the better locus for environmental policy making. This Article's recommendation that one clean energy policy (RPS) be implemented at the federal and another (FIT) at the state level offers support for this more open ended, modern public choice narrative.[261]

Finally, the preceding case studies in clean energy federalism have explored many of the factors that govern institutional inquiries using dynamic federalism theory. Besides scale matching, dynamic federalism also examines the import of parallel policy action at various levels of governance, the evolution of regulatory authority and its historic allocation within the federal system. With its call for parallel and coordinated policy action by multiple states and/or by both federal and state governments, the proposed model for closer integration of RPS and FIT policies[262] offers a poignant example of dynamic federalism theory in action.[263]

A. *Classic Federalism and the Matching Principle*

The proper allocation of regulatory authority across federal, state, and local government has been a topic of scholarly debate since the founding fathers crafted the Constitution.[264] Classic federalism theory commonly

260. *Infra* Section IV.A.

261.. *Infra* Section IV.B.

262. *See supra* Sections III.B and III.C.

263. *Infra* Section IV.C.

264. *See* Osofsky & Wiseman, *Dynamic Energy Federalism*, *supra* note 28, at 807; *see also* THE FEDERALIST NO. 10, at 62–63 (James Madison's account of federalism).

seeks to resolve the issue of multilevel governance based on the government's internalization of the costs and benefits associated with new policy.[265] This theory deems federal regulation preferable to state-level regulation if the former can avoid spillover effects or externalities that would arise from the latter.[266] The classical school of federalism rests on the presumption that "better" policies emerge when policy makers weigh all relevant costs and benefits.[267] Against this background, the environmental federalism literature has developed the "matching principle" to guide the determination of the most efficient level of governance.[268] According to the matching principle, "the size of the geographic area affected by a specific pollution source should determine the appropriate governmental level for responding to the pollution."[269] Such scale matching has become a staple of classic federalism theory.[270]

At a glance, application of the matching principle to climate and clean energy policy appears to suggest the federal, not state, forum as the ideal level for policy innovation. The Supreme Court has clarified that the anthropogenic greenhouse gas emissions driving global warming and climate change[271] constitute air pollutants under the Clean Air Act.[272] Climate science indicates that the heat-trapping effect of greenhouse gases in the atmosphere manifests itself across the globe regardless of

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265. *See, e.g.*, Larry Kramer, *Understanding Federalism*, 47 VAND. L. REV. 1485, 1498 (1994) ("[S]tate regulation was defended as a means of adapting law to local conditions and tastes, while national regulation was thought necessary to prevent mutually disadvantageous attempts by states to impose costs on each other . . . .").

266. *See, e.g.*, Revesz, *Rehabilitating Interstate Competition*, *supra* note 138, at 1222 (describing the presence of interstate externalities as "a powerful reason for intervention at the federal level"); Richard B. Stewart, *Pyramids of Sacrifice? Problems of Federalism in Mandating State Implementation of National Environmental Policy*, 86 YALE L.J. 1196, 1215–16 (1977) (discussing physical, psychic, and economic spillover effects). For an instructive example of such interstate spillover or externalities, see Thomas W. Merrill, *Golden Rules for Transboundary Pollution*, 46 DUKE L.J. 931, 932 (1997) (describing transboundary pollution as a "clear case for shifting regulatory authority from local to more centralized levels of governance").

267. *See* Butler & Macey, *supra* note 29, at 25; *see also* David E. Adelman, *Environmental Federalism When Numbers Matter More Than Size*, 32 UCLA J. EVTL. L. & POL'Y 238, 308 (2014) ("For the classical school, the primary consideration is whether regulatory agencies internalize the environmental costs and benefits of their policies.").

268. *See* Butler & Macey, *supra* note 29, at 25 (tracing their matching principle back to JAMES M. BUCHANAN & GORDON TULLOCH, THE CALCULUS OF CONSENT: LOGICAL FOUNDATIONS OF CONSTITUTIONAL GOVERNMENT 113–16 (1962)).

269. *See* Butler & Macey, *supra* note 29, at 25.

270. *See, e.g.*, Osofsky & Wiseman, *Dynamic Energy Federalism*, *supra* note 28, at 807 ("The vast majority of this scholarship focuses on 'scale matching' . . . .").

271. *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 1, at 13–14 (discussing drivers of global warming and climate change).

272. Massachusetts v. Envtl. Prot. Agency, 549 U.S. 497, 532 (2007) ("[G]reenhouse gases fit well within the Act's capacious definition of 'air pollutant' . . . .").

whether these gases are emitted in New York or New Delhi.[273] To match the size of the geographic area affected by greenhouse gas pollution, as prescribed by the matching principle, policy to mitigate climate change should therefore be implemented at the global level or, in the absence of international consensus, at least at the federal level. By itself, however, this view fails to consider the cornucopia of other, often more localized, costs and benefits that climate and clean energy policy can create.

To be sure, many of the environmental and other societal costs associated with anthropogenic climate change and the benefits derived from its successful mitigation accrue to the global population at large. But these are not the only costs imposed by greenhouse gas emissions or the only benefits from their reduction through successful climate change mitigation. FIT, RPS, and other climate and clean energy policies have the potential to significantly reduce the locally incurred environmental costs of electricity generation. By displacing coal and other carbon-intensive power with solar, wind, and other low-carbon, renewable power, these policies help mitigate environmental problems and adverse health impacts from air pollutants concentrated around fossil fuel-fired power plants.[274] Another, more localized environmental benefit from FIT, RPS, and other climate policy lies in the capacity of renewable power generation to conserve precious water resources.[275]

From an economic perspective, climate policy that promotes greenhouse gas pollution abatement also encourages refinement of existing and development of new abatement technologies, such as those related to renewable energy generation.[276] Accordingly, implementation of FIT, RPS, and other innovative policies to address global climate change fosters technological innovation.[277] In fact, empirical work has long highlighted the net positive employment effects of climate change mitigation through the build-out of renewable power capacity. Some analysts forecast that by 2030, one out of every four U.S. workers, i.e., 37 million Americans, could work in the renewable energy and energy

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273. For an instructive example of the globally felt effects of greenhouse gas emissions, independent of their point of origin, see the Environmental Protection Agency's unsuccessful argument that regulation of domestic greenhouse gas emissions would be ineffective due to projected increases in greenhouse gas emissions from China, India, and other developing nations. *See id.* at 523–24.

274. *See* Levy & Spengler, *supra* note 106, at 2.

275. *See, e.g.*, Sovacool & Cooper, *Congress Got It Wrong*, *supra* note 17, at 127–28 (noting how a federal RPS can help to conserve water).

276. *See* Kolev & Riess, *supra* note 6, at 137 (discussing the impact of environmental policy on technology innovation).

277. *See generally* Adam B. Jaffe et al., *Environmental Policy and Technological Change*, 22 ENVTL. & RES. ECON. 41 (2002) [hereinafter Jaffe et al., *Environmental Policy*] (examining the relationship between environmental policy and technological change).

efficiency industries—assuming appropriate public policy support.[278] Others emphasize that a renewables-based energy economy will create more jobs per megawatt of power installed, per unit of energy produced, and per dollar of investment than today's fossil fuel-based energy economy.[279] Critically, the vast majority of these jobs are created locally—in construction, operation, or maintenance, among others—even if solar panels, wind turbines, and other equipment are imported from foreign manufacturers.[280] The recent climate policy activism at the state and even municipal levels confirms the importance of and appreciation for these and other localized costs and benefits associated with climate change and its successful mitigation.

This Article's exercise in clean energy federalism does not seek to invalidate the matching principle but rather calls for applying it with greater nuance. In their original form, the matching principle and classic federalism theory focus primarily, if not exclusively, on the top-level, farthest-reaching effects of a given pollution source or other policy issue. This emphasis is considered necessary to avoid spillover effects and externalities that may result from addressing a pollution or other policy issue with only partial geographic coverage.[281] In the process, however, the matching principle may overlook other more localized but nevertheless critical impacts and considerations. The tenet that "regulatory authority should go to the political jurisdiction that comes closest to matching the geographic area affected by a particular externality"[282] presumes that policy makers can effectively isolate different issues and externalities to address them individually. In reality, public policy often lacks the surgical precision of a ten-blade. Environmentally motivated and targeted policy inevitably entails economic policy, such as pollution policy that increases short-term production costs while promoting long-term innovation of abatement technologies.[283] Together, these and other considerations may not only

278. *See* AM. SOLAR ENERGY SOC'Y, DEFINING, ESTIMATING, AND FORECASTING THE RENEWABLE ENERGY AND ENERGY EFFICIENCY INDUSTRIES IN THE U.S. AND IN COLORADO 33 (2008), *available at* http://cospl.coalliance.org/fedora/repository/co:2056.

279. *See* Max Wei et al., *Putting Renewables and Energy Efficiency to Work: How Many Jobs Can the Clean Energy Industry Generate in the U.S.?*, 38 ENERGY POL'Y 919, 919–20 (2010); *see also* DANIEL M. KAMMEN ET AL., PUTTING RENEWABLES TO WORK: HOW MANY JOBS CAN THE CLEAN ENERGY INDUSTRY CREATE? 1, 3 (2004) (including a meta-analysis of thirteen studies on the employment effects associated with the large-scale deployment of low-carbon, renewable energy capacity).

280. *See id.* at 6, 12–13.

281. *See supra* note 266 and accompanying text.

282. Butler & Macey, *supra* note 29, at 53.

283. *See* Kolev & Riess, *supra* note 6, at 137; *see also* Jaffe et al., *Environmental Policy*, *supra* note 277, at 61.

justify but mandate policy implementation with less-than-complete geographic coverage as illustrated by the RPS and FIT case studies in climate and clean energy policy.[284]

B. *Public Choice Theory*

When Nobel laureate Kenneth Arrow published his seminal work *Social Choice and Individual Values*,[285] he laid the foundation for a new field of social science that has become a dominant theme in contemporary legal scholarship.[286] Originally derived from microeconomics, public choice theory treats regulatory decision-making as an analogue to market decision-making.[287] According to this analogy, legislative, regulatory, and electoral institutions form an economy in which various actors, including citizens, interest groups, and policy makers, exchange regulatory goods based on the same market principles governing the demand and supply of ordinary economic goods.[288] Regulatory goods run the policy-making gamut from direct subsidies to tariffs to market and price controls.[289] A central tenet of public choice theory is that organized groups enjoy greater influence in the regulatory marketplace than individual voters because the group's greater aggregate benefits from a given regulatory good enable it to outbid the individual voter.[290]

Today public choice theory informs scholarly analysis of judicial and administrative decision-making processes across a wide range of substantive contexts.[291] The federalism literature also has embraced it as

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284. *See supra* Subsection II.B.2.

285. KENNETH J. ARROW, SOCIAL CHOICE AND INDIVIDUAL VALUES (1951).

286. *See* Edward L. Rubin, *Public Choice in Practice and Theory*, 81 CAL. L. REV. 1657, 1657 (1993) ("While its origins lie in microeconomics, public choice theory has clearly become one of the dominant themes in contemporary legal scholarship.").

287. *See* Steven P. Croley, *Theories of Regulation: Incorporating the Administrative Process*, 98 COLUM. L. REV. 1, 34–56 (1998) (offering an overview and critique of public choice theory).

288. *See, e.g.*, Richard A. Posner, *Theories of Regulation*, 5 BELL J. ECON. & MGMT. SCI. 335–36 (1974); George J. Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON. & MGMT. SCI. 3–4 (1971).

289. *See* Stigler, *supra* note 288, at 4–6.

290. *See, e.g.*, Croley, *supra* note 287, at 39–40 ("[T]he regulatory market works, on the whole, to the advantage of organized groups with narrow interests.").

291. *See generally* William N. Eskridge, Jr., *Politics Without Romance: Implications of Public Choice Theory for Statutory Interpretation*, 74 VA. L. REV. 275 (1988) (applying public choice theory to statutory interpretation by the courts); Paul J. Larkin, Jr., *Public Choice Theory and Overcriminalization*, 36 HARV. J.L. & PUB. POL'Y 715 (2013) (discussing the application of public choice theory to the issue of overcriminalization); Daniel H. Lowenstein, *Campaign Spending and Ballot Propositions: Recent Experience, Public Choice Theory and the First Amendment*, 29 UCLA L. REV. 505 (1982) (applying public choice theory to ballot measures and campaign spending); Jonathan R. Macey, *Public Choice: The Theory of the Firm and the Theory*

a powerful tool for resolving multilevel governance issues.[292] For much of the twentieth century, the prevailing public choice narrative for federalism theory favored federal over state action, citing agency capture and other distortions from well-organized, cohesive industry groups as a major deterrent to effective policy making at the sub-federal level.[293] In the environmental federalism literature, several commentators have sought to bolster the pro-federal implications of public choice theory by highlighting the difficulties and transaction costs of mobilizing and coordinating heterogeneous environmental interests in fifty or more separate and disparate jurisdictions.[294] Centralized policy making at the federal level is considered to mitigate these challenges by offering economies of scale and reduced transaction costs to diffuse environmental interests as they rally toward concerted policy action in a single forum.[295] Others have pushed back against the pro-federal account of public choice theory, warning that the national aggregation of diverse environmental interests jeopardizes their homogeneity and, in the process, exacerbates organizational problems of interest groups.[296]

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of Market Exchange, 74 CORNELL L. REV. 43 (1988) (discussing the relationship between public choice theory in the context of legislation, the theory of the firm, and the theory of market exchange); Thomas W. Merrill, *Does Public Choice Theory Justify Judicial Activism After All?*, 21 HARV. J.L. & PUB. POL'Y 219 (1997) (arguing that public choice theory justifies judicial activism); Matthew L. Spitzer, *Multicriteria Choice Processes: An Application of Public Choice Theory to* Bakke, *the FCC, and the Courts*, 88 YALE L.J. 717 (1979) (applying public choice theory to medical school admissions decisions, Federal Communications Commission hearings decisions, and judicial decision processes). For a comprehensive account of the widespread adoption of public choice theory by legal scholarship, see DANIEL A. FARBER & PHILIP P. FRICKEY, LAW AND PUBLIC CHOICE 1–11 (1991).

292. *See generally* Stefania A. Di Trolio, *Public Choice Theory, Federalism, and the Sunny Side to Blue-Sky Laws*, 30 WM. MITCHELL L. REV. 1279, 1282 (2004) (applying public choice theory to conclude that the best way to protect the public is to encourage state enforcement of securities laws); Jonathan R. Macey, *Federal Deference to Local Regulators and the Economic Theory of Regulation: Toward a Public-Choice Explanation of Federalism*, 76 VA. L. REV. 265 (1990) (discussing Congress's deferral of regulation to local regulators and its relationship to public choice theory); Revesz, *Race to the Bottom*, *supra* note 138 (discussing the application of public choice theory to the justification of federal regulation of environmental protection); Thomas S. Ulen, *Economic and Public-Choice Forces in Federalism*, 6 GEO. MASON L. REV. 921, 924 (1998) (analyzing public choice theory to help understand the costs of having "competing jurisdictions within a federal structure").

293. *See, e.g.*, FARBER & FRICKEY, *supra* note 291, at 73–78.

294. *See, e.g.*, Esty, *supra* note 138, at 650–51 (noting that "state and local environmental policy manipulation often goes unnoticed"); Stewart, *supra* note 266, at 1213 (pointing to the "formidable transaction costs" facing individual stakeholders seeking to organize for concerted action).

295. *See* Joshua D. Sarnoff, *The Continuing Imperative (But Only from a National Perspective) for Federal Environmental Protection*, 7 DUKE ENVTL. L. & POL'Y F. 225, 285–86 (1997).

296. *See* Revesz, *Race to the Bottom*, *supra* note 138, at 563 & n.35 (citing JACK L. WALKER,

Moreover, the theory of collective action suggests that members of a larger group have less incentive than those of smaller groups to coordinate toward achieving a collective benefit.[297] Accordingly, some have cautioned that based on public choice theory, "it is not clear whether environmental interests will systematically fare better at the federal or at the state level."[298]

The preceding RPS and FIT case studies in clean energy federalism support the skepticism over the traditional public choice narrative's general endorsement of federal over state and other sub-federal policy action. Advocates of state RPS programs often point to the political landscape and its collective action challenges to make their case: "[R]elative to the nation as a whole, the geographic scale of states can present a more manageable forum for policy development."[299] Even the most fervent proponents of federal climate and clean energy policy acknowledge the significant difficulties of reaching a national consensus over U.S. clean energy policy: "[F]or too long, the pursuit of a 'silver bullet' national renewable energy strategy, embraced by all and burdensome to none, has kept the capacity of renewable generation ludicrously below its potential."[300] Recent congressional history shows how difficult it is to build the necessary consensus for a strong federal RPS, FIT, or other climate and clean energy policy.[301] To be sure, the state forum, too, has oft proven unfertile ground for RPS and FIT proposals.[302] Yet, through extensive trial and error, a remarkable twenty-

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MOBILIZING INTEREST GROUPS IN AMERICA: PATRONS, PROFESSIONS, AND SOCIAL MOVEMENTS 66 (1991) (discussing the difficulties groups with highly decentralized constituents face to organize and speak with a unified voice in Washington, D.C.)).

297. *See* MANCUR OLSON, THE LOGIC OF COLLECTIVE ACTION: PUBLIC GOODS AND THE THEORY OF GROUPS 132 (Schocken Books ed., 3d ed. 1963); *see also* Croley, *supra* note 287, at 13 ("[T]he logic of collective action implies that, under certain circumstances, the bigger the 'public' in question the farther below the desirable level will the supply of public goods be.").

298. Revesz, *Race to the Bottom*, *supra* note 138, at 577. *See also* Emily Hammond & David L. Markell, *Administrative Proxies for Judicial Review: Building Legitimacy from the Inside-Out*, 37 HARV. ENVTL. L. REV. 313, 319, 351–53 (2013) (noting the responsiveness of EPA and, ultimately, state policy makers to concerns raised by petitions seeking withdrawal of state authority to implement the Clean Air Act, Clean Water Act, and other major federal environmental statutes).

299. Doran, *supra* note 148, at 97; *see also* Thomas D. Peterson & Adam Z. Rose, *Reducing Conflicts Between Climate Policy and Energy Policy in the US: The Important Role of the States*, 34 ENERGY POL'Y 619, 619–20 (2006).

300. Benjamin K. Sovacool & Christopher Cooper, *Green Means "Go?"—a Colorful Approach to a U.S. National Renewable Portfolio Standard*, ELECTRICITY J., Aug.–Sept. 2006, at 19, 30.

301. *See, e.g.*, Davies, *Power Forward*, *supra* note 14, at 1341; Welton, *supra* note 14, at 996.

302. *See* the examples of failed state legislative initiatives mentioned *supra* note 15 and accompanying text.

nine states, the District of Columbia, and three U.S territories have implemented state RPS programs, FIT programs, or both.[303]

The ongoing debate in the environmental federalism literature and this Article's exercise in clean energy federalism both suggest that public choice theory should not be relied on for a general, *a priori* endorsement of federal over state policy action. The kaleidoscope of factors at play in the regulatory marketplace, including the nature of the regulatory good in question and the range of interested actors, calls for a more nuanced, open-ended public choice inquiry that may, on a case-by-case basis, point to either the federal or state forum, or both, for implementation of climate and clean energy policy.

C. *Dynamic Federalism*

The literature on dynamic federalism seeks to resolve issues of multilevel governance by moving beyond classic federalism's focus on the linearly defined, alternative relationship between state and federal actors. Instead, dynamic federalism theory draws on multilayered, interdependent models of governance to incorporate interactions both between and among various levels of government.[304] Consideration of inter- and intra-agency relationships along vertical and horizontal axes has yielded a more spatialized, multidimensional approach to federalism.[305] Recent scholarship has further explored the iterative, temporal dimension of federalism dynamics.[306]

Applied to climate and clean energy policy, dynamic federalism theory would consider many, if not all, of the factors explored in the

303. Seven of the twenty-nine RPS states—California, Hawaii, Maine, Oregon, Rhode Island, Vermont, and Washington—have adopted FIT regimes. *See supra* note 15.

304. For examples of the rich and growing literature on dynamic federalism covering a broad range of subjects, see generally Kirsten H. Engel, *Harnessing the Benefits of Dynamic Federalism in Environmental Law*, 56 EMORY L.J. 159 (2006) (arguing for a dynamic view of federalism in environmental law where environmental issues may handled at either the state or federal level); Harrop A. Freeman, *Dynamic Federalism and the Concept of Preemption*, 21 DEPAUL L. REV. 630 (1972) (discussing the concept of preemption within the context of dynamic federalism); Renee M. Jones, *Dynamic Federalism: Competition, Cooperation and Securities Enforcement*, 11 CONN. INS. L.J. 107 (2004) (discussing the need for a multilevel approach to securities enforcement); Xuan-Thao Nguyen, *Dynamic Federalism and Patent Law Reform*, 85 IND. L.J. 449, 451 (2010) (critiquing the "top-down, national only approach to patent reform" and arguing that patent reform can take place at both the national and local level); Osofsky & Wiseman, *Dynamic Energy Federalism*, *supra* note 28 (proposing a new model grounded in dynamic federalism to better meet the need for reliable energy sources).

305. *See, e.g.*, Buzbee, *supra* note 22, at 1550–55; Allan Erbsen, *Horizontal Federalism*, 93 MINN. L. REV. 493, 495 (2008); Hari M. Osofsky, *Diagonal Federalism and Climate Change Implications for the Obama Administration*, 62 ALA. L. REV. 237, 241 (2011).

306. *See, e.g.*, Ann E. Carlson, *Iterative Federalism and Climate Change*, 103 NW. U. L. REV. 1097, 1114–18 (2009).

preceding case studies of FIT and RPS policy. In addition to the classical school's scale matching,[307] dynamic federalism examines and weighs the import of parallel policy action at various levels of governance,[308] from federal to state to local agencies,[309] as well as the evolution of regulatory authority and its historical allocation within the federal system.[310]

The nuanced, seemingly inconsistent recommendation for implementation of RPS policy at the federal and FIT policy at the state level represents the logical conclusion to dynamic federalism theory's multipolar consideration of intra- and inter-agency relationships. The overlay of horizontal and vertical axes with a temporal dimension yields an institutionally agnostic approach to solving multilevel governance challenges. The proposed model for closer integration of RPS and FIT policies[311] operationalizes dynamic federalism theory by harnessing the capacity of regulators at any level of government to act effectively both in concert and, where appropriate, in competition with one another.

CONCLUSION

Ten years ago, energy was described as "the center stage upon which environmental law, certainly in terms of global warming and many other environmental issues, will be played."[312] Over the past decade, hydraulic fracturing for shale gas and oil, nuclear reactor (re)licensing, biofuel mandates for the transport sector, integration of a growing share of renewables into the electricity mix, and other controversies at the intersection of environmental and energy law have proven these words downright visionary. Along the way, clean energy law has begun to emancipate itself from environmental law in the scholarly debate. Drawing on the well-established environmental federalism literature, the emerging literature on clean energy federalism is a symptom of clean energy law's coming of age. This Article adds to that literature by offering two case studies, a novel model for policy integration, and theoretical insights to the clean energy federalism literature.

FIT and RPS policies both seek to mitigate climate change by promoting the build-out of low-carbon, renewable energy infrastructure. Yet, subtle differences in both policies' design characteristics point to different policy implementation pathways. Existing regulatory authority and the greater ability to account for local needs and opportunities suggest that FIT programs are better suited for implementation at the state rather than federal level. RPS policy, on the other hand, requires a market

307. *See supra* Subsections II.A.1, II.A.2, II.B.2 and III.A.

308. *See supra* Subsections II.A.3, II.B.1 and II.C.2.

309. *See supra* Subsections II.C.2.

310. *See supra* Subsections II.B.3 and II.C.1.

311. *See supra* Sections III.B and III.C.

312. Ferrey, *supra* note 149, at 262.

size and uniformity of such scale that it is better implemented at the federal rather than state level.

Contrary to the literature's traditional view that RPS and FIT policies represent mutually exclusive policy alternatives, this Article proposes a model for closely integrating both policies toward a better, more efficient allocation of investor and regulatory risk. Properly integrated, a joint RPS–FIT regime could harness the competitive market forces inherent in portfolio standards and redirect them to optimize overall risk allocation. In interstate competition, these forces would help reduce the cost to ratepayers of FIT programs. With aggregate risk mitigation greater than the sum of its parts, such an integrated RPS–FIT regime could leverage higher private-sector investment in renewables while requiring lower returns than necessary under less coordinated current policy approaches.

From a theoretical perspective, this Article offers insights to elucidate the relationship between environmental federalism and clean energy federalism. Specifically, these insights call for a more nuanced, multi-dimensional application of environmental federalism's matching principle, offer support for a more open-ended, institutionally agnostic public choice narrative, and operationalize dynamic federalism theory in the clean energy arena.