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The Limits of a National Renewable Portfolio Standard Commentary: The Future of Energy Policy: A National Renewable Portfolio Standard

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In this Commentary Article, Professor Rossi highlights some of the distributional and operational problems presented by a national renewable portfolio standard ("RPS") in electric power. He also offers several solutions to these problems as a way of advancing a cautionary defense of a national RPS. Ultimately, Professor Rossi concludes that addressing climate change will need to involve more systemic and larger scale modifications to regulation of the electric power industry.

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The Limits of a National Renewable Portfolio Standard

JIM ROSSI*

I. INTRODUCTION

Use of federal law to expand the development of renewable sources of electric power has more than a thirty-year history. In the Public Utility Regulatory Policies Act of 1978 ("PURPA"), Congress committed itself to a program designed to subsidize the growth of non-fossil fuel sources of electric power by requiring utilities to buy back the surplus power from alternative generators.[1] Later energy statutes and budget bills have contained a variety of incentives and production subsidies (many temporary) for developers of renewable power projects.[2] Despite such federal efforts, and substantial commitment to similar proposals at the state level, growth of renewable power sources as a share of the overall nationwide portfolio of electric power generation has remained relatively flat: renewable sources other than hydroelectric power today represent little more than three percent of the overall generation portfolio, with only a slight increase from where things stood in 1990.[3]

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[1] Public Utility Regulatory Policies Act of 1978, Pub. L. No. 95-617, 92 Stat. 3117–18, 3134, 3144 (1978). Section 210 of PURPA provided for avoided cost rates for qualifying small power production facilities, including those using wind, solar, biomass, and geothermal to produce electric power. *Id.* In 2005, Congress eliminated the availability of avoided cost rates for future projects in situations where a utility lacks market power. Energy Policy Act of 2005, Pub. L. No. 109-58, § 1253, 119 Stat. 594, 967–98 (2005).

[2] Subsidies include direct tax credits, grants, and low interest loans. In fiscal year 2007, it is estimated that federal subsidies supporting renewable energy sources totaled $4.9 billion, more than tripling the $1.4 billion in annual subsidies for renewables the federal government provided in fiscal year 1999. Production tax credits to wind alone in FY 2007 totaled $666 million. Energy Info. Admin., U.S. Dep't of Energy, *How Much Does the Federal Government Spend on Energy-Specific Subsidies and Support?*, *in* ENERGY IN BRIEF (2008), *available at* http://tonto.eia.doe.gov/energy_in_brief/print_pages/energy_subsidies.pdf.

[3] Forecasts for future growth in renewables remain optimistic. While historical data show growth in new renewable projects, the overall percentage of renewable power in the nation's electric power generation portfolio has remained relatively flat. In 2008, renewable energy constituted 7% of the electricity consumed by U.S. customers. The bulk of this is hydroelectric (34%) and biomass (53%). Wind (7%) has experienced the most significant growth of renewable sources in recent years. Energy Info. Admin., U.S. Dep't of Energy, *How Much Renewable Energy Do We Use?*, *in* ENERGY IN BRIEF (2009), *available at* http://tonto.eia.doe.gov/energy_in_brief/renewable_energy.cfm [hereinafter EIA, *How Much Renewable Energy*]. The overall growth of renewables has been fairly flat and overall they may not have increased as an overall portion of the nation's generation portfolio. In 1990, renewables

Drawing on the experience of more than two dozen states, recent reform proposals at the national level endorse a mandate for utilities to use renewable power in their generation portfolios, or to pay others to develop renewable resources. Many industry leaders have called for a national approach to renewable energy mandates.[4] Several commentators in the legal literature, including Lincoln Davies[5] and Joshua Fershee,[6] have advanced systematic arguments that a national renewable portfolio standard ("RPS") can pave the way to widespread development of renewable resources, increased energy security and sustainability, and climate change mitigation. A national RPS would build on the approach of as many as thirty-six states that already require or encourage a certain percentage of the power that utilities sell to come from renewable sources. Such a policy proposal is similar to reforms under consideration in various energy bills, including the Waxman-Markey bill approved in 2009 by the U.S. House of Representatives.[7]

Past efforts to use legal reforms—and especially regulatory mandates—to induce technological change in the energy industry, however, have produced mixed results.[8] At the national level, renewable power as an overall percentage of the nation's portfolio of power generation has grown only slightly over the past thirty years.[9] Despite the optimistic predictions of many national RPS advocates, a national RPS mandate is unlikely to be the silver bullet that destroys the significant barriers to renewable power development, including siting and cost allocation barriers that limit the ability of renewable energy to compete on a large scale with more conventional forms of power generation. A national RPS is especially unlikely to have a tangible impact on climate

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constituted 7.4% of energy consumed. ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, RENEWABLE RESOURCES IN THE U.S. ELECTRICITY SUPPLY 5 (1993) [hereinafter EIA, RENEWABLE RESOURCES], *available at* ftp://ftp.eia.doe.gov/pub/electricity/renewmas.pdf.

[4] *See, e.g.*, Daniel P. Krueger & Andre Begosso, *Mandating Federal Renewables*, PUB. UTIL. FORT., Jan. 2010, at 40, 42.

[5] Lincoln L. Davies, *Power Forward: The Argument for a National RPS*, 42 CONN. L. REV. 1339, 1343–44 (2010).

[6] Joshua P. Fershee, *Changing Resources, Changing Market: The Impact of a National Renewable Energy Portfolio Standard on the U.S. Energy Industry*, 29 ENERGY L.J. 49, 55–56 (2008). For additional commentary appearing in this Issue, see generally Joshua P. Fershee, *Moving* Power Forward*: Creating a Forward-Looking Energy Policy Based on a National RPS*, 42 CONN. L. REV. 1405 (2010).

[7] American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (as passed by House of Representatives, June 26, 2009).

[8] *See* Gary E. Marchant, *Sustainable Energy Technologies: Ten Lessons from the History of Technology Regulation*, 18 WIDENER L.J. 831, 834 (2009) ("Notwithstanding the many available legal options for attempting to induce technology change in energy supply and demand, forcing beneficial technology change is a difficult endeavor.").

[9] EIA, RENEWABLE RESOURCES, *supra* note 3, at 7, tbl.3; EIA, *How Much Renewable Energy*, *supra* note 3.

change mitigation without larger scale modifications to the electric power system which, on its own terms, an RPS fails to address.

This Commentary Article highlights some of the economic issues presented by a national RPS mandate and, based on its limits, offers only a cautionary defense of it. Part II briefly summarizes the regulatory approach of a national RPS and identifies its primary goals, which are not always coextensive. Part III emphasizes how specific mandates that are focused—at least at the margin—on a handful of states may not be as efficient or fair of a regulatory approach to promoting new renewable technologies as using other regulatory tools, such as broad-based subsidy financing through an income tax. Further, where demand for a regulated activity is elastic, mandates produce substitution effects for firms that can be inefficient or have other unintended consequences. In short, a national RPS may crowd out the next least expensive form of generating electricity—natural gas—at the cost of both efficiency and climate change mitigation. Part IV addresses how some of the distributional, inefficiency, and substitutability problems created by a national RPS can be alleviated with other regulatory tools, such as broad-based national subsidies, a carbon tax or cap-and-trade, or broader national or regional approaches to energy resource management. Part V concludes that, at best, a national RPS should be approached with caution. Whether a national RPS is desirable will depend on how it is designed and whether it is part of a larger energy package containing more fundamental reforms to the electric power system.

II. THE REGULATORY APPROACH AND GOALS OF A NATIONAL RPS

Congress has considered a number of bills proposing a national RPS of five percent to twenty percent by deadlines ranging from 2010 to 2020. None have passed into law. The most recent attempt at a national RPS was in the House-adopted Waxman-Markey bill, more formally known as the American Clean Energy and Security Act.[10] The Waxman-Markey national RPS (which legislation refers to as a "renewable electricity standard")[11] requires retail electricity providers (i.e., investor-owned utilities, municipals, rural cooperatives) selling more than four million megawatt-hours ("MWh") per year to meet a minimum share of annual sales with electricity savings and qualifying renewable generation. Qualifying renewable resources include solar, wind, biomass, landfill gas, and geothermal, but not nuclear.[12] Renewable targets would begin at six

[10] H.R. 2454.

[11] *Id.* § 101. Although Waxman-Markey and other federal bills use the term "renewable electricity standard" rather than RPS, I use the terms interchangeably throughout this Article.

[12] *Id.* § 101(a)(a)(17). Although not included as qualifying renewable resources, sales of generation from new nuclear, new carbon capture and sequestration, and existing hydropower capacity

percent in 2012 and rise to twenty percent by 2020.[13] In addition to selling power from qualified sources, firms could meet their national RPS requirement through purchasing renewable energy credits ("RECs"), and qualifying renewable generation sources could sell, trade, and bank federal RECs for three years following the generation of electric power.[14] Waxman-Markey also contains a savings provision, which provides that establishing a national RPS would preserve individual state RPSs[15]—an important provision given that many state RPS standards exceed the proposed federal standard.

Contained within the national RPS is a basic mandate, similar to many state RPSs, that a certain percentage of power sold or produced by utilities come from renewable sources. This "mandate" aspect of the national RPS parallels the approach of many states, but the national RPS would also do something that many state RPSs do not. While many state RPS programs contain RECs, national RPS proposals such as Waxman-Markey would unify the national market by creating a nationwide REC market, including those states that do not have access to natural resources to develop renewable sources of power generation. I refer to this important feature of a national RPS as the "market unification" aspect. Most proponents of a national RPS conflate these two features, but as argued below, they can and should be disentangled in debates surrounding the design of a national RPS.

A national RPS responds to many problems and has multiple goals. It is well recognized that state approaches to encouraging renewable power in the form of an RPS mandate are imperfect. The approach of individual states to RPS mandates varies substantially[16]—from as low as a modest four percent to as high as an ambitious thirty percent.[17] As Professor Davies' survey highlights, states also vary drastically in the enforcement of RPS requirements.[18] Both proponents and opponents of a national RPS recognize that state RPSs have not exactly been effective at increasing reliance on renewable resources in the mix of generation sources for electric power.[19]

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would be deducted from a retail provider's total sales for determining whether the requirement was met.

[13] *Id.* § 101(a)(d). Up to twenty-five percent of these targets could be met with energy efficiency measures (and individual state governors could petition to raise this amount to forty percent). *Id.* § 101(a)(b).

[14] *Id.* § 101(a)(e).

[15] *Id.* § 101(a)(k).

[16] *See* Davies, *supra* note 5, at 1385 (noting that "the trend is one of difference, not uniformity").

[17] *See* EPA, Renewable Portfolio Standards Fact Sheet, www.epa.gov/chp/state-policy/renewable_fs.html (last visited June 17, 2010).

[18] *See* Davies, *supra* note 5, at 1386–89.

[19] *See* Robert J. Michaels, *A Federal Renewable Electricity Requirement: What's Not To Like*?, 627 CATO INST. POL'Y ANALYSIS 1, 1 (2008), *available at* www.cato.org/pub_display.php?pub_id=9768 [hereinafter Michaels, *What's Not To Like*] ("Support for a national program largely stems from

Professor Davies describes the problem as follows:

> State measures have in fact severely fragmented the renewables market by using widely differing eligibility criteria and, more problematically, limitations on RECs. State RPSs also erect geographically-based renewables trade barriers at an alarming rate. Finally, state RPSs have varied widely in both their delivered benefits and costs, and in their design.[20]

Davies advances the RPS as a way of "fostering renewables development through an effective and efficient market, a market where geography does not matter."[21]

But an RPS does not change the stark reality that renewable resource access varies greatly from region to region in the United States. Southeastern states have strong potential for the development of biomass, but, in comparison to the West, they have very limited opportunities for the development of wind, solar, and geothermal. It should not be surprising that the geographic distribution of natural resources varies across states based on the regional weather and land variation. Given this, it is not clear why Professor Davies and others see "fragmentation" as a problem, unless national uniformity is somehow considered a goal of a regulatory renewable mandate. It does seem odd to embrace uniformity as an implicit goal in this kind of regulatory context, although uniformity does seem to be something overvalued in many other areas of regulatory law.[22] While I do not see uniformity as a legitimate regulatory goal in this context, I also do not intend to dismiss concerns with the limited effectiveness of current state regulatory approaches. As a number of commentators have observed, since utilities can and often do procure power on the interstate market, leakage (buying power from out of state, regardless of how it was generated) may undermine state efforts to promote renewables through an RPS.[23] By ensuring that credits are stable and consistent over time and between states, a national REC program can help to mitigate this problem.

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misleading claims about state-level successes, misunderstandings about how renewables interact with other environmental regulation, and misinformation about the actual benefits renewables create."); Robert J. Michaels, *National Renewable Portfolio Standard: Smart Policy or Misguided Gesture?*, 29 ENERGY L.J. 79, 81 (2008) [hereinafter Michaels, *Smart Policy or Misguided Gesture*] ("[T]he record of state-level RPS compliance and enforcement strongly suggests that the effects of a federal program will be either minimal or perverse.").

[20] Davies, *supra* note 5, at 1375.

[21] *Id.* at 1364.

[22] *Cf.* Amanda Frost, *Overvaluing Uniformity*, 94 VA. L. REV. 1567, 1584–97 (2008) (questioning uniformity in federal law). Frost concludes that "the federal courts have overvalued uniformity in the interpretation of nonconstitutional federal law." *Id.* at 1639.

[23] *See* Davies, *supra* note 5, at 1379–82; Fershee, *Changing Resources, Changing Markets*, *supra* note 6, at 62; Michaels, *What's Not To Like*, *supra* note 19, at 27.

Apart from the issue of leakage, the goals of a national RPS echo many of the goals of a state RPS. An RPS mandate is often touted as a mechanism to spur technological innovation and the growth of a new energy industry that is more attuned to energy sustainability goals; to the extent a national RPS strengthens the interstate market in energy credits for renewables, it can encourage states to develop new incentives for renewable technologies and provide greater regulatory stability for developers of renewable projects, rather than relying on the current patchwork of approaches among states.[24] By increasing the amount of electric power generated by renewable resources, it is maintained that an RPS mandate would promote broad energy policy goals of energy independence and security.[25]

In addition, because renewable approaches to generating electric power emit fewer greenhouse gases than their alternatives (primarily fossil fuels), proponents frequently maintain that a national RPS could help to mitigate climate change.[26] In comparison to many other environmental problems, climate change itself is a problem that is more national or international in scope, rather than localized in the connection between activities and the harms they produce,[27] suggesting that a more national approach to solving the problem should be favored over local solutions. Professor Davies uses this observation to highlight how a national RPS provides an opportunity for the merging of environmental and energy law[28]—a union that seems irresistible, at least in theory.

III. ASSESSING THE EFFECTS OF A NATIONAL RPS

While many of the purported benefits that would accompany a national RPS are desirable, the climate change benefits are hardly guaranteed. A national RPS has distributional and firm behavior consequences. These consequences could dampen some of the benefits of a national RPS, especially if it is adopted as a stand-alone program or without more systematic reforms to environmental and energy law. Depending on the baseline used in evaluating a national RPS, the distributional effects of an RPS mandate (paid for through rates increases passed on to customers) are not as desirable from either a fairness or efficiency perspective as a

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[24] *See* Davies, *supra* note 5, at 1358 (discussing job growth and noting that the core purpose of an RPS is to promote "a new energy market in renewables to, in turn, spur the transition to a sustainably fueled society").

[25] *See id.* at 1373 (describing energy independence as "the Holy Grail of American energy policy").

[26] *See id.* at 1370–72 (outlining the environmental effects of RPS standards).

[27] *See* Jonathan B. Wiener, *Think Globally, Act Globally: The Limits of Local Climate Policies*, 155 U. PA. L. REV. 1961, 1962 (2007) (arguing that the state-level effort to combat climate change is not the best course of action).

[28] Davies, *supra* note 5, at 1390–95.

national subsidy financed through the federal income tax. The firm substitutability effects of a national RPS also may not be desirable from either the perspective of efficiency or the goal of reducing greenhouse gas emissions.

A. *Fairness and Efficiency Effects of the RPS*

All national RPS proposals to date contain a basic mandate for firms. Despite Professor Davies' claim that the RPS "is not a tax,"[29] in effect any such mandate must either be financed by firms or by consumers and thus has subsidy effects. The current approach to RPSs—which varies from state to state—applies a mandate only to firms within individual states that have adopted RPSs. A national RPS, in contrast, would apply to all firms regardless of location and must either be paid for by each firm's customers (if passed on through regulated rates) or absorbed by the firm as a cost.

Much of the debate regarding the cost of a national RPS is focused on the impact it will have on average consumer rates. Data suggest that, on average, the impact of an RPS mandate on electricity rates, while not trivial, is as low as one percent—a relatively minimal impact on average rates.[30] The more significant impact of a national RPS is on the distribution of its effects on prices across various customer groups. Any regulatory approach to promote renewables through an RPS mandate has different subsidy impacts for customers in different states, and thus (much like a tax) needs to be assessed from the perspective of who bears how much of the burden, as well as whether the implicit redistribution reflected in the RPS is fair and efficient.

Professor Davies' comprehensive analysis of state RPS approaches reminds us how difficult such an evaluation can be. Evaluating the desirability of the redistribution reflected in a national RPS requires careful consideration of the status quo baseline against which any new policy will be evaluated. Specifically, should the policy baseline for assessing a national standard be no RPS at all? Or should the baseline take into

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[29] *Id.* at 1391.

[30] In March 2007, the Lawrence Berkeley National Laboratory ("LBNL") released an analysis of twenty-eight different state- or utility-level RES cost impact studies over the previous decade. Nineteen studies predicted rate increases of no greater than one percent, and only two projected increases of greater than five percent, while six studies projected rate *decreases*. The LBNL calculated that the median impact on a monthly residential electric bill of an RES would be $0.38. CLIFF CHEN ET AL., WEIGHING THE COSTS AND BENEFITS OF STATE RENEWABLES PORTFOLIO STANDARDS: A COMPARATIVE ANALYSIS OF STATE-LEVEL POLICY IMPACT PROJECTIONS 2, 58 (2007), *available at* http://eetd.lbl.gov/ea/ems/re-pubs.html. When other possible benefits of renewable energy facilities are factored in, such as avoiding the environmental externalities associated with mining and transportation of fossil fuels, reducing emissions from fossil fuel generation and avoiding the associated health costs due to those emissions, and reducing power plant costs and risks associated with construction, the minimal cost impact does not seem to be a barrier to the adoption of an RPS.

account current state RPSs that are in existence throughout much of the United States?

As Professor Davies highlights, as many as thirty-six states and the District of Columbia already have RPSs in place.[31] The existence of current mandates in the majority of states might suggest that the incremental costs of adopting a national standard are fairly modest, since only a minority of states may bear the cost. While only a minority of states would need to incorporate the new standards of a national RPS, the impact of a national RPS is also disproportionately borne by consumers in states that currently lack an RPS. To the extent such customers are located in states that lack access to renewable resources, a national RPS could serve as a form of wealth transfer from residents in states that lack natural resources to states that have resources that are rich for development and export for renewable development. Some degree of redistribution with the transition from state-centered approaches to a national approach to an RPS is inevitable. It appears, however, that much of that burden will be concentrated on states that bear higher costs in complying with an RPS standard than states that are resource rich.[32]

On the other hand, Professor Davies places considerable emphasis on the ineffectiveness of patchwork state approaches in achieving their own regulatory goals. If states have RPS standards that are ineffective and if a national RPS cures such defects, the overall costs of a national RPS could be significantly greater than existing state RPSs, but the distributional impacts would be spread more evenly across states and not as concentrated geographically. To the extent this is the case, the wealth transfer problem of a more concentrated RPS mandate is dampened, but the premise of ineffective state regulation also undermines the argument advanced by some RPS advocates that adopting a national RPS mandate reflects only a modest change in policy given that a majority of states already have adopted an RPS of some sort.

Even if the distributional impacts of a national RPS were borne consistently across all states, there are still serious concerns with the fairness and efficiency of an RPS mandate. The type of subsidy reflected

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[31] Davies, *supra* note 5, at 1341–42. Others report that the number of states with RPSs is smaller. *See, e.g.*, K. S. CORY & B. G. SWEZEY, NAT'L RENEWABLE ENERGY LAB., RENEWABLE PORTFOLIO STANDARDS IN THE STATES: BALANCING GOALS AND IMPLEMENTATION STRATEGIES 1 (2007), *available at* http://www.nrel.gov/analysis/scepa_rps.html (reporting that twenty-five states and the District of Columbia had enacted RPS standards by the end of 2007).

[32] One of the only empirical studies of when states adopt RPSs determined that in-state RPS requirements are more likely to be adopted by states with poor air quality that are rich in renewable resources with low amounts of existing renewable electricity generation. In other words, states have adopted RPSs when local benefits are high and local costs are very low. *See* Thomas P. Lyon & Haitao Yin, Why Do States Adopt Renewable Portfolio Standards?: An Empirical Investigation 4 (Sept. 7, 2009) (unpublished manuscript), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1025513.

in a national RPS does not provide the transparency or efficiency of an explicit subsidy. The costs of RPSs, whether state or federal, are borne by the customers of those utilities that are subject to an RPS mandate. If such a mandate were adopted at a regional level, based on the variation of natural resources and weather conditions, the costs of encouraging development of renewable resources might match directly to the benefits for that utility's customers. This cost/benefit principle is the basic premise on which cost-of-service utility ratemaking has operated: Where benefits are concentrated to specific groups of customers, as a matter of fairness and efficiency, it also makes sense to concentrate costs on these customers.

It is questionable, however, whether a national RPS would always work this way. Since many of the benefits of an RPS are either concentrated on individual states that are rich in natural resources (e.g., the benefit of expanding the sustainable energy economy is not, in the near term, a benefit every state will see, in terms of jobs, economic development) or are diffuse (e.g., the benefit of reducing greenhouse gas emissions is not something unique to citizens of an individual state), a national RPS is not as likely to have a direct cost/benefit impact on customer groups who finance it. To spread costs more broadly where benefits are concentrated on just a few customers, or on those who reside in a limited area, has distributional impacts and, to the extent demand is elastic—as it is in the interstate market for electricity—may cause customers to substitute away from the firm whose prices are being increased to subsidize that state's renewable energy industry. Where the benefits of a social program are not homogenous, or are diffuse, across geographic areas, a national tax and subsidy may be more transparent, fairer, and more efficient than an implicit subsidy built into state-set retail utility rates.

In addition, under a national RPS, customers would likely pay for this subsidy based on the amount of power consumed. The costs associated with the subsidy will be shared among poor and wealthy customers. The impact of a national RPS would almost certainly be more regressive than the same result achieved through a uniform national subsidy—since the costs of a uniform national subsidy would be borne by taxpayers based on wealth, not by consumers based on usage. In the end, whatever Congress decides to call it, a national RPS mandate has the effect of a tax and needs to be compared to other approaches to taxation, including national subsidies that are supported through an income tax and, in its design, attention needs to be paid to minimize the inefficiency and unfairness of an unevenly concentrated RPS.

Feed-in tariffs, or efforts to guarantee a price for the purchase of power from renewable sources, also involve some form of redistribution but may have advantages over an RPS. Since feed-in tariffs are subsidized by each individual utility's customers through increased rates, they too are

subsidized at the local level and are shared by poor and wealthy customers based in large part on the usage of energy. Professor Davies criticizes feed-in tariffs,[33] which are a regulatory strategy used in Europe. Similar to the approach of PURPA-avoided costs, such tariffs guarantee a stream of payments for developers of renewable projects. Ultimately, feed-in tariffs and RPSs will be financed in a similar manner: at the local utility level through increased rates. In this sense, a national RPS and a state or local feed-in tariff will have similar distributional effects as their costs are passed on to the customers of those utilities that are subject to such requirements. The feed-in tariff, however, may be more consistent with locally-produced renewable power—and in this sense, more directly matches costs and benefits to local customers—so it probably has a more limited distributional impact than the RPS.

B. *Effects on Firm Behavior*

An RPS mandate can also affect firm behavior and produce unintended consequences. Specifically, mandates can have adverse substitution effects on firms in the energy industry. One criticism of environmental regulation is that, in many instances, regulators have failed to pay attention to what Tim Malloy refers to as "micro-market" effects.[34] Such effects include resource allocation decisions by firms (and their constituent actors) as they consider how to respond to regulation. Sometimes, the response by firms will be consonant with other regulatory objectives, but sometimes the micro-market effects of firms may lead to conduct that departs from the broader intended goals of a regulatory system.[35] One such effect is how a regulatory mandate may lead a firm to substitute one undesirable behavior with another behavior that produces other social ills.

For example, consider the impact of another national regulatory mandate: ethanol requirements in gasoline refining. The combination of subsidies and regulatory mandates for corn-based ethanol have had the unintended effect of significantly increasing food prices as land for food crops has shifted to growing corn for fuel.[36] Such a shift in production decisions has impacted the price of food for citizens of developing nations,

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[33] *See* Davies, *supra* note 5, at 1391 (arguing that feed-in tariffs are undesirable because they carry with them the connotation of a tax.).

[34] Timothy F. Malloy, *Regulating by Incentives: Myths, Models and Micromarkets*, 80 TEX. L. REV. 531, 537 (2002) (stating that the term "micro–market" is synonymous with a firm's allocation function). The allocation function serves as "the process by which the firm distributes resources among . . . projects," and it is often the case that the firm will choose not to partake in the intended benefits of a regulatory investment because such an investment might conflict with one of the firm's corporate goals. *Id.* at 538.

[35] *Id.* at 538.

[36] *See* Marchant, *supra* note 8, at 843–44; Clifford Krauss, *Ethanol, Just Recently a Savior, Is Struggling*, N.Y. TIMES, Feb. 12, 2009, at A1.

contributing to the global food shortage.[37] In addition, cultivation of corn for biofuels has had other adverse environmental impacts, such as increasing the pollution runoff into the Chesapeake Bay from increased agricultural production on surrounding farms.[38]

In the context of a national RPS, a regulatory mandate could also produce adverse substitution effects. Any assessment of the effects of an RPS mandate on firms must begin by recognizing that most utilities draw on a portfolio of power generation sources. The present portfolio of resources for most utilities is heavily biased toward fossil fuels. The fuel mix in the current industry-wide portfolio may not be socially desirable given concerns about energy security and climate change; at the same time, there are power system reasons that certain resources are more desirable than others, including meeting base load demand and responding to short-term power peaks. In addition, utilities are only able to use certain generation sources to the extent they have sufficient access to transmission resources to transport them, and different generation technologies have different transmission requirements in terms of both location and capacity. The portfolio substitution effects of an RPS mandate and transmission constraints seriously hinder the ability of an RPS mandate to achieve its goals.

In terms of generation portfolio, an RPS mandate requires firms to allocate their financial resources to either produce or procure electric power from sources that are significantly more costly than traditional fossil fuels, such as coal. A utility firm is unlikely to absorb the costs of compliance with an RPS from its own profit margins. To the extent a firm's demand for various approaches to generating electricity is elastic (i.e., responsive to changes in price), an RPS requirement may lead to substitution away from more expensive forms of producing electric power and toward the firm's least expensive options. Coal already comprises nearly half of the generation of electric power in the United States.[39] In addition, based on the current market price of fuel, it is one of the lowest marginal cost resources for firms seeking to generate electric power, given that there is already substantial power generation and transportation

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[37] Lewis J. Perelman, *The Near-Term Potential of Climate-Friendly Technologies*, *in* FELIX CHR. MATTHES & LEWIS J. PERELMAN, AICGS POLICY REPORT NO. 37: SHORT-TERM SOLUTIONS TO THE CLIMATE AND ENERGY CHALLENGE 7, 15 (Amer. Inst. for Contemporary German Studies, Johns Hopkins Univ. 2008), *available at* http://www.aicgs.org/documents/pubs/polrep37.pdf.

[38] *Id.*; *see also* Marchant, *supra* note 8, at 844.

[39] In 2007, coal comprised nearly fifty percent of the generation capacity for electric power in the United States. *See* Energy Info. Admin., U.S. Dep't of Energy, Electricity in the United States: Energy Explained, Your Guide to Understanding Energy, http://tonto.eia.doe.gov/energyexplained/index.cfm?page=electricity_in_the_united_states (last visited June 17, 2010) [hereinafter EIA, Your Guide to Understanding].

infrastructure to support coal.[40] Coal also has the largest carbon impact of fuels used in electric power production.[41]

In terms of cost, natural gas, which comprises about twenty percent of electric power production capacity,[42] is typically more expensive and subject to greater market price variation than coal,[43] but natural gas also has one of the lowest carbon impacts of any fossil fuel.[44] It is for this reason that many see natural gas as playing an important role in greenhouse gas reduction and global warming mitigation.[45] For example, a Resources for the Future study concludes that "[t]he RPS tends to encourage renewables largely at the expense of natural gas, and thus is less effective at reducing carbon emissions than would be a direct tax on carbon emissions."[46] If an RPS leads to substitution away from natural gas and toward coal, it will undermine any greenhouse gas reduction goal of a national RPS.

In addition to cost factors that might undermine the benefits of an RPS mandate for climate change mitigation, such substitution may also produce inefficiencies in the operation of electric power systems.[47] System-wide operational factors may encourage adverse substitution away from natural gas and other less carbon intensive sources of generating electric power. To begin, assume that a utility plans to satisfy demand with its own power plants. If demand is not increasing, then renewables might, at least in theory, allow the utility to retire existing plants or use them less. The

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[40] J.W. Anderson, *Coal: Dirty Cheap Energy*, RESOURCES, Winter 2005, at 31, 32–33, *available at* http://www.rff.org/Publications/Resources/Documents/156/RFF_Resources_156_coal.pdf.

[41] *See* ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, EMISSIONS OF GREENHOUSE GASES IN THE UNITED STATES 2008, at 2 (2009), *available at* ftp://ftp.eia.doe.gov/pub/oiaf/1605/cdrom/pdf/ggrpt/057308.pdf (noting that coal is the second-largest fossil fuel carbon dioxide contributor (after petroleum) and that the electric power sector is the single largest source of all energy-related carbon dioxide emissions); Anderson, *supra* note 40, at 32.

[42] *See* EIA, Your Guide to Understanding, *supra* note 39.

[43] *See* Anderson, *supra* note 40, at 32 (observing how an increased use of natural gas during the 1990s resulted in a rapid rise in gas prices that have subsequently doubled since 1999).

[44] *See* Union of Concerned Scientists, How Natural Gas Works, http://www.ucsusa.org/clean_energy/technology_and_impacts/energy_technologies/how-natural-gas-works.html?print=t (last visited June 17, 2010).

[45] The American Clean Skies Foundation, along with the U.N. Foundation and Worldwatch Institute, sponsored a side conference during the Copenhagen talks that emphasized the benefits of carbon emissions of natural gas. *See* Gregory C. Staple, *NGO Says Natural Gas Provides New Option for Immediate U.S. Carbon Cuts*, P.R. NEWSWIRE, Dec. 12, 2009, http://www.prnewswire.com/news-releases/ngo-says-natural-gas-provides-new-option-for-immediate-us-carbon-cuts-79124117.html; *see also* Pierre Briancon, *A Call to Arms from Copenhagen*, N.Y. TIMES, Jan. 1, 2010, at B2 ("Cheap gas encourages utilities to build more gas-fired power plants, which are cleaner than coal-powered ones.").

[46] Karen Palmer & Dallas Burtraw, *Cost-Effectiveness of Renewable Electricity Policies*, 27 ENERGY ECON. 873, 874 (2005).

[47] In making this argument, I do not intend to overstate the efficiency of the status quo. The status quo generation portfolio nationwide is far too heavily invested in coal and is under-diversified in certain respects. Taking the status quo fuel mix, however, some diversification exists for reasons related to system-wide reliability and efficiency, so any change from the present system must acknowledge and address impacts on system-wide reliability and efficiency.

operational decisions of utility firms, however, complicate the decisionmaking process. Most utilities use computer programs to help them decide which plants to dispatch, based primarily on cost and operational criteria. The grid operator—whether it is a regional organization to which the utility has given operational control, or the utility itself—typically makes decisions about what plants to dispatch on the basis of "merit order," as Professor Davies acknowledges.[48]

In general, the operator will prefer to run the plants first that are least expensive to run, taking into account operational and reliability limitations. Since the demand for electricity is not constant across time, utilities operate some plants all the time (to meet "base load") and bring others on- and off-line to meet peak demand at times when customer usage of electricity is highest. Different technologies for generating electric power, however, have "ramp rates": some generators, such as natural gas-fired peaking plants can be brought on-line quicker than others. A utility typically runs nuclear and coal plants as baseload plants because they provide inexpensive power and cannot be switched on and off quickly.[49] That means that, in terms of both cost and operational considerations, new renewable generation is most likely to displace natural gas plants that are switched on and off as needed because they are efficient and low cost options.

The strongest case for renewables having a limited substitution effect may be in markets where the demand for electricity is increasing and utilities possess excess transmission capacity. If the demand is increasing, new renewables could allow the utility to avoid building a new power plant. Adding renewables to the grid would offset the need to build some (if not all) new fossil fuel-fired generation.[50] As Professor Davies highlights, some argue that a national RPS could increase demand for

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[48] Davies, *supra* note 5, at 1371.

[49] Robert Michaels has observed that "[n]uclear and coal units have low operating costs, but their output can not be altered quickly enough to match unexpected changes in load." Michaels, *What's Not To Like*, *supra* note 19, at 22.

[50] Researchers Christopher Cooper and Benjamin Sovacool discuss a variety of studies that conclude that an RES would lead to lower generation from fossil fuel plants, and, in some cases, perhaps even displace baseload plants. CHRISTOPHER COOPER & BENJAMIN SOVACOOL, RENEWING AMERICA: THE CASE FOR FEDERAL LEADERSHIP ON A NATIONAL RENEWABLE PORTFOLIO STANDARD (RPS) 32, 97, 140 (2007), *available at* http://www.newenergychoices.org/dev/uploads/Renewing America_NNEC_Final.pdf. A frequently cited study is the Department of Energy's 2007 report, which concluded with respect to fifteen RESs that "[t]he increase in renewable generation stimulated by the RPS primarily displaces coal-fired generation. By 2030, coal generation is 3,086 billion kilowatthours with the RPS compared with 3,330 billion kilowatthours in the reference case, a reduction of about 7 percent." ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, IMPACTS OF A 15-PERCENT RENEWABLE PORTFOLIO STANDARD 8 (2007), *available at* http://www.eia.doe.gov/oiaf/servicerpt/prps/pdf/sroiaf (2007)03.pdf. In response, Professor Michaels criticizes the Department of Energy's studies for their reliance on the National Energy Modeling System computer model, which he believes uses a flawed methodology—especially with respect to its predictions of future natural gas prices and development of renewable energy production technologies. *See* Michaels, *What's Not To Like*, *supra* note 19, at 19–20.

conventional generation. Facilities that rely on intermittently available resources, particularly wind, cannot be guaranteed to be available when a utility needs them. Assuming that demand is growing in a way that offsets any substitution away from natural gas for cost and operation reasons, some believe that this could actually increase demand for natural gas fired generation.[51] Others observe that, in terms of new capacity, solar and wind facilities can be deployed more quickly than natural gas plants, which face longer lead times for permitting and other matters,[52] although it is not clear that this claim is correct.[53] In addition, intermittency concerns with resources such as wind can be alleviated if a large number of wind turbines are spread around the state in windy areas, increasing the chances that some of them generate electricity at the right moment. A utility might well conclude that the increased geographical dispersion of renewable energy facilities could actually increase the reliability of its system as a whole, although this requires a transmission system with sufficient capacity to accommodate renewables.[54]

In sum, cost considerations affecting substitutability would suggest that if an RPS mandate is not financed in a way that provides 100% cost recovery to firms, so as to leave a firm neutral with respect to its resource

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[51] Jim Kerr, former president of the National Association of Regulatory Utility Commissioners, argues that this could lead an RPS to increase demand for natural gas-fired generation, not decrease it. Testifying on the Waxman-Markey bill before the House Energy and Commerce Committee, he stated:

> Some have suggested that simultaneous implementation of an RES and a climate change policy could lesson demand for natural gas by driving power providers away from natural gas and towards renewables. Unfortunately, we are likely to see the opposite result. Unlike natural gas or coal, which can be extracted and stored or transported for later use, renewable power is highly variable and must be backed up. The most likely candidate to support these variable renewable resources is natural gas.
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> Notably, several regional transmission organizations and the TVA recently issued a report which shows that in the eastern U.S. when electric demand is at peak load wind is only available 30% of the time. The report goes on to conclude that the gap between that 30% and meeting 100% of the demand will have be filled by building natural gas fired generating capacity.

Hearing Before the H. Subcomm. on Energy and Air Quality, 111th Cong. 7–8 (Apr. 23, 2009) (statement of James Y. Kerr, II, Counsel, Electric Reliability Coordinating Council) (citations omitted).

[52] *See* COOPER & SOVACOOL, *supra* note 50, at 8.

[53] Many renewable facilities are facing obstacles that equal or exceed opposition and delays for fossil fuel plants. A leading poster child for regulatory delays is the Cape Wind project off the coast of Massachusetts. *See* Ed Feo & Josh Ludmir, *Challenges in the Development and Financing of Offshore Wind Energy*, 14 ROGER WILLIAMS U. L. REV. 672, 677 (2009) (describing why residents of Massachusetts oppose the Cape Wind project for aesthetic reasons due its potential to interfere with views and recreational activities). For discussion of the common law tort barriers that are also presenting delays to many renewable projects, see generally Stephen Harland Butler, *Headwinds to a Clean Energy Future: Nuisance Suits Against Wind Energy Projects in the United States*, 97 CAL. L. REV. 1337 (2009).

[54] It is well recognized that, due to the intermittent nature of most renewable resources, electric power generated from renewable resources requires greater transmission capacity than power generated from traditional base load resources such as nuclear or fossil fuels. For further discussion, see Jim Rossi, *The Trojan Horse of Electric Power Transmission Line Siting Authority*, 39 ENVTL. L. 1015, 1041–43 (2009).

allocation decisions, an RPS would likely create incentives for firms to substitute away from natural gas and toward coal as a fuel source for the non-renewable portion of its generation portfolio. A cheaper fuel source, such as coal, could help a firm to subsidize compliance with the RPS mandate. Such substitution, however, would increase carbon emissions and thus is not consistent with the climate change mitigation goal of the RPS. Even if cost recovery makes firms neutral regarding substitution away from natural gas, system-wide operational considerations would likely still favor using less natural gas for peaking purposes.

Finally, Professor Davies' study highlights how both state and national RPS proposals suffer from an overly narrow definition of what qualifies as "renewable." In many instances, conservation and efficiency are excluded from state proposals.[55] State RPSs and national RPS proposals also exclude nuclear power from the definition of renewables for purposes of an RPS mandate.[56] Under Waxman-Markey, only solar, wind, biomass, landfill gas, and geothermal qualify as renewable sources for the national RPS.[57] From the perspective of encouraging economic development and investment in specific technologies, such an approach seems focused. Favored technologies, however, change and regulators have a particularly poor track record in choosing technological winners and such an approach could undermine the technology-forcing goal of a national RPS. Moreover, a narrow definition of what qualifies for an RPS risks subverting the climate change mitigation goal of the national RPS. By defining what qualifies for an RPS too narrowly, regulators may inadvertently discourage the growth of technological innovation and new approaches to generating electric power, or avoiding the construction of new generators that have lower greenhouse gas impacts than alternatives. In this sense, an overly narrow RPS will not contribute as much to climate change reduction as alternative regulatory approaches could.

IV. CONFRONTING THE PROBLEMS WITH A NATIONAL RENEWABLE PORTFOLIO MANDATE

Much of the rhetoric favoring a policy instrument such as a national RPS, including Professor Davies' very comprehensive survey of the flaws with state approaches, is full of positives, but the potentially adverse distributional and economic effects of a national RPS mandate should not be ignored. Policy makers have ways to address some of these adverse effects without abandoning an RPS, as some (such as the economist Robert

[55] The leading federal proposal also limits the extent to which conservation and efficiency may be used to meet the national RPS standard. *See supra* notes 10–15 and accompanying text.

[56] Marchant, *supra* note 8, at 840.

[57] American Clean Energy and Security Act of 2009, H.R. 2454, § 101(a)(a)(17), 111th Cong. (2009).

Michaels) have suggested.[58] Ultimately, regulators must approach the design of a national RPS with an understanding of how it interacts with other aspects of national energy policy, rather than consider the RPS as a stand-alone regulatory measure that can effectively promote its goals on its own terms.

A. *Minimizing Distributional Impacts*

A permanent national subsidy (in the form of grants, production tax credits, or loan guarantees) provides a more fair and efficient tool than a national RPS for promoting renewables. In terms of distributional effects, such a subsidy would not be as regressive as a national RPS. In addition, the allocation of the subsidy to firms would be more politically accountable and transparent than the implicit subsidy reflected in the mandate of a national RPS. A national subsidy may also be a more efficient, adaptive, and precise lever for inducing investments in new technologies.

A permanent national subsidy, however, seems to be a politically unlikely solution for addressing the growth of renewable power in the United States. Most subsidies for renewable power in the United States tend to be temporary. Moreover, most tend to be technology specific, whereas a national RPS is indifferent between various technological approaches. In addition, such a subsidy may compete with primary research and development programs supported by the Department of Energy and other agencies.

If not adopted as a permanent national subsidy, two reforms may help dampen some of the problems related to a national RPS mandate. First, any national RPS must recognize that access to natural resources and the weather conditions necessary to exploit them is not equally distributed among all fifty states. The baseline for an RPS requirement should not be an absolute requirement that is even across all states, but should be a percentage increase over each state's current percentage of renewable power production. In addition, allowing states to meet the RPS standard through conservation and efficiency (as does Waxman-Markey, to a degree), in addition to developing new renewable technologies or purchasing RECs, would dampen the disproportionate burden some states would otherwise be forced to bear under a national RPS mandate. States

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[58] *See* Michaels, *Smart Policy or Misguided Gesture*, *supra* note 19, at 81 (arguing that an "[RPS] will be an inefficient and inequitable environmental policy that reduces emissions at higher cost than necessary"); Michaels, *What's Not To Like*, *supra* note 19, at 32 (concluding that an RPS constitutes "a poor intervention for resolving problems that markets can handle only imperfectly"). Michaels also testified before Congress in opposition to Waxman-Markey—in large part in opposition to its national RPS requirement. *See Hearings on the American Clean Energy Security Act of 2009 Before the H. Subcomm. on Energy and Env't*, 111th Cong. 3 (Apr. 23, 2009) (testimony of Robert J. Michaels, Ph.D.).

that do not have access to natural resources for development might also be allowed to meet the national RPS through the development of nuclear or other low carbon technologies that have been excluded from the overall narrow definition of technologies in a national RPS. Most state RPSs exclude nuclear technology,[59] and pending federal proposals do as well.[60] Another technology that regulators should consider including in an RPS is carbon capture and sequestration—Michigan includes such technologies in its RPS,[61] but (at least according to Davies' survey) other states have not followed suit.[62]

Second, a national requirement that states provide for 100% cost recovery for compliance with an RPS could be important to encouraging firms to be neutral with their own resource allocation decisions with an RPS. Absent a clear statement by Congress preempting state regulators, cost recovery for decisions to build renewable plants to comply with a national RPS or to purchase RECs will be subject to prudence determinations by state regulators.[63] Especially in instances where a new technology proves more expensive than originally anticipated, or where the funding for RECs goes to firms in another state or region of the country, there will be natural pressures for state regulators to disallow some costs. If firms are ensured recovery of 100% of the costs of compliance, then substitution effects will be limited to operational considerations and the problems highlighted above will not undermine the climate change goals. In addition, some of the distributional impacts of cost recovery could further be eliminated if Congress authorized regional organizations, such as regional transmission organizations ("RTOs"), to facilitate cost spreading for compliance with a national RPS.

B. *Pricing Carbon*

It is myopic to advance a national RPS mandate without also first confronting the pricing of carbon, whether in the form of a carbon tax or

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[59] Most of the state standards do not include nuclear and many explicitly exclude nuclear, although, as Davies acknowledges, a few state RPS standards do include nuclear. Davies, *supra* note 5, at 1361 n.134, 1367–68.

[60] *Id*. at 1365.

[61] Michigan allows a portion of its RPS to be met with credits from an "[a]dvanced cleaner energy system," which is defined, in part, as "[a] coal-fired electric generating facility if 85% or more of the carbon dioxide emissions are captured and permanently geologically sequestered." MICH. COMP. LAWS SERV. § 460.1003 (LexisNexis Supp. 2009); Donna M. Attanasio, *Surveying the Risks of Carbon Dioxide: Geological Sequestration and Storage Projects in the United States*, 39 ENVTL. L. REP. NEWS & ANALYSIS 10,376 (2009).

[62] Davies, *supra* note 5, at 1377 fig.1.

[63] Particularly, given impediments to the siting and construction of new renewable facilities, regulators must also stand prepared to allow cost recovery of planning costs for projects that do not reach fruition. *See infra* text accompanying notes 76–80.

cap-and-trade.[64] Both a carbon tax and cap-and-trade would work to internalize the costs associated with the carbon impacts of various approaches to generating electricity. Effectively, carbon pricing mechanisms (such as a carbon tax or cap-and-trade) would represent a significant national tax on the usage of coal and other fossil fuels with significant carbon impacts. In terms of cost, a carbon tax or cap-and-trade would have little impact on the cost of using renewable approaches to generating electricity. Such reforms would have much less of an effect on the cost of natural gas (which is less carbon intensive) than coal. A carbon tax or cap-and-trade, however, would significantly increase the relative cost of using coal, thus discouraging firms from substituting away from other technologies and toward coal. Only if carbon is priced to take into account environmental harms will firms have accurate incentives in making decisions about the fuel mix of their electric power generation portfolios.

It is well recognized that an RPS on its own cannot accomplish broader climate change goals such as greenhouse gas reduction. A study in 2009 by three Department of Energy researchers concluded that "[w]hile the RPS does help reduce emissions, it is an imperfect substitute for cap-and-trade, even in the 2025 timeframe. This is because coal use needs to be reduced drastically to make large emissions cuts and the RPS does not directly address this."[65] As compared to a national RPS, a cap-and-trade system "admits a broader range of GHG abatement policies."[66] As Robert Michaels has highlighted, the RPS approach "gives renewables priority simply because they are renewables rather than because they are efficient ways to mitigate pollution."[67] In this sense, an RPS operates like conventional command-and-control regulation: it "may be inefficient because it forecloses any possibility that other policies can do the same job at a smaller cost."[68] It does not allow polluters to choose their most cost-effective way of complying with the law, but instead mandates that more of specified types of renewable energy technology be built.

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[64] I do not intend to obfuscate the distributional and efficiency differences between a carbon tax and cap-and-trade. While a carbon tax may have many advantages over cap-and-trade, David Weisbach has argued that in the domestic setting the differences between the two approaches can be mitigated through proper design. David A. Weisbach, *Instrument Choice Is Instrument Design* 1 (U. of Chi. John M. Olin L. & Econ. Working Paper No. 490, 2009), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1493312; *see also* David Weisbach & Gilbert Metcalf, *The Design of a Carbon Tax*, 33 HARV. ENVTL. L. REV. 499, 502–03 (2009) (discussing similarities between the implementation of a tax and a cap-and-trade system). Whether Congress has the political will to recognize such differences is another matter.

[65] AUDREY LEE ET AL., U.S. DEP'T OF ENERGY, REGIONAL IMPACTS OF A NATIONAL RENEWABLE PORTFOLIO STANDARD (2009), *available at* http://www.usaee.org/usaee2009/submissions/ExtendedAbs/AudreyLee.doc.

[66] *Id*.

[67] Michaels, *What's Not To Like*, *supra* note 19, at 26.

[68] *Id*. at 24.

Moreover, the substitution effects an RPS could encourage can undermine climate change goals if a carbon pricing mechanism such as cap-and-trade is not also in place. Michaels also suggests that besides being less economically efficient than a market-based system, an RPS might increase pollution by other pollutants already subject to market-based regulation, notably sulfur dioxide:

> An RPS must also be evaluated in the context of existing environmental regulations that it will supplement (or possibly replace). Pollutants that are under cap-and-trade regimes may be particularly affected. If renewables reduce emissions of a capped pollutant, owners of conventional plants that remain in operation will be able to increase theirs. Allowance prices will fall and conventional plant owners will not need to make investments to further cut their emissions. Emissions will remain at the cap level, but the reduction due to the renewables could have been achieved more cheaply by the conventional generators.[69]

A study by the Electric Power Research Institute ("EPRI") examined six scenarios for California's limits on GHG emissions under the state's Global Warming Solutions Act. These scenarios included a "Pure Trade" scenario and an "RPS 20" scenario that would impose an RPS without any cap-and-trade system. The EPRI study concluded that the RPS 20 scenario would not reduce emissions as much as a cap-and-trade system, and that "[a]ttempts to combine cap-and-trade with regulatory systems—such as . . . Renewable Portfolio Standards (RPS) . . . may diminish overall cost-effectiveness."[70] This study confirmed that "[b]road cap-and-trade programs are more cost-effective than are command-and-control regulations because the former can equalize the cost of avoiding an additional ton of emissions (marginal abatement costs) across all available options."[71]

In addition to building some subsidy mechanisms into a national RPS, cap-and-trade (or some other form of carbon pricing, such as a carbon tax) would maximize the likelihood that an RPS standard would achieve its intended goals. While some economists advance this concern as an argument against any national RPS,[72] it only means that an RPS is not as likely to be effective in advancing larger climate change goals on its own. Put simply, a national RPS without cap-and-trade will not have much

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[69] *Id*. at 26.

[70] ELEC. POWER RES. INST., ECONOMIC ANALYSIS OF CALIFORNIA CLIMATE INITIATIVES: AN INTEGRATED APPROACH, at 1-3 to 1-4, 3-6 (2007), *available at* http://mydocs.epri.com/docs/public/000000000001014641.pdf.

[71] *Id*. at 1-6.

[72] *See, e.g.*, Michaels, *What's Not To Like*, *supra* note 19, at 26.

traction in achieving carbon reduction goals. Congress should not adopt a national RPS mandate unless it is also committed to adopting a cap-and-trade or some form of a carbon tax.

C. *Toward a New Approach to Planning and Siting Energy Facilities*

Finally, and related to Professor Davies' observation that a national RPS provides an opportunity to forge a new alliance between environmental and energy law,[73] a national RPS calls for reassessment of the traditional approach to siting facilities in the context of electric power systems. Focusing on the RPS or on other incentives for renewables masks some important legal and regulatory barriers that renewable projects continue to face at the state and local level, including the obstacles of siting approval and how costs for new projects and for infrastructure to serve them will be allocated.

Since the siting of renewable facilities involves competing land use concerns, as well as larger concerns related to the "need" for additional infrastructure, state and local regulators have continued to assert authority over such decisions. While there is no doubt that state and local governments retain a significant interest and should have meaningful input into the process, it is questionable whether such an assertion of state authority continues to be justified. For example, state and local opposition to new transmission line projects have limited the growth of transmission infrastructure that is essential to the development of new renewable power projects in certain areas of the United States. Already, federal regulators have begun to appreciate the problem with leaving planning and siting entirely within the hands of state regulators by expanding federal authority over transmission line siting.[74] Both existing law and pending reform proposals afford federal authorities backstop authority to override state or local regulators where there are significant national interests, while retaining considerable input and initial decisionmaking authority at the state and local level.[75]

The transmission siting obstacles federal authorities have begun to address are significant, as limited transmission infrastructure remains one of the largest obstacles to widespread deployment of renewable resources. For example, a recent study prepared for the National Renewable Energy Laboratory suggests that it is feasible for wind power to constitute twenty to thirty percent of the electric generation capacity for the eastern two-

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[73] Davies, *supra* note 5, at 1391–95.

[74] Ashley C. Brown & Jim Rossi, *Siting Transmission Lines in a Changed Milieu: Evolving Notions of the "Public Interest" in Balancing State and Regional Considerations*, 81 COLO. L. REV. (forthcoming 2010) (manuscript at 26, on file with author).

[75] *See id*. at 26–28 (discussing how the Federal Energy Regulatory Commission's authority has been amended to give additional federal authority in siting decisions).

thirds of the United States, but that this would require the investment of over $100 billion in transmission infrastructure.[76] State and national RPS mandates do nothing to remove the obstacles associated with seeking state and local regulatory approval for transmission infrastructure. Indeed, the barriers are far deeper than RPS advocates care to acknowledge. One of the major disputes in transmission also is who should bear the costs of new transmission infrastructure—an issue that divides states and requires federal regulators to explicitly address cost allocation issues between producers and consumers of electric power from new renewable projects. Renewable project developers and customers in large urban areas, for example, stand to benefit from transmission upgrades in the Midwest, but utilities that do not stand to immediately benefit have opposed efforts to regionalize the costs of these projects in transmission rates. In a recent Seventh Circuit case, Judge Posner wrote an opinion that required the Federal Energy Regulatory Commission to quantify the benefits from allocating the costs of new transmission to wholesale customers.[77] Dissenting in part, Judge Cudahy favored regional sharing of transmission costs given the difficulty with quantifying reliability benefits of new transmission.[78] Such cost allocation issues remain one of the most contentious issues today in the energy industry. Not only does a national RPS fail to address them, but it also may delay their resolution. To the extent that a national RPS mandate is coupled with RECs, it could obscure any urgency to upgrade transmission by fragmenting renewable markets and encouraging the development of projects in geographic areas that face no current transmission constraints.

As Professor Davies highlights, adopting a national RPS could usher in a new era in which many of the goals and regulatory tools in environmental and energy law merge. Such a merger has been occurring over the past thirty years.[79] The concern with the national RPS with a vehicle for such a merger is that it nationalizes renewable energy requirements while leaving many other decisions, including overall utility fuel mix and the siting of renewable facilities, in the hands of state and local regulators. One particular area of convergence that a national RPS could make inevitable in the future regards decisions about the planning and siting of new power plants. Decisions regarding the planning and

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[76] NAT'L RENEWABLE ENERGY LAB., EASTERN WIND INTEGRATION AND TRANSMISSION STUDY 23, 27, 30 (2010), *available at* http://www.nrel.gov/wind/systemsintegration/pdfs/2010/ewits_final_report.pdf; *see also* Matthew L. Wald, *Wind Power for the East Said Attainable, at a Cost*, N.Y. TIMES, Jan. 21, 2010, at B6 (discussing the results of the National Renewable Energy Laboratory study).

[77] Ill. Commerce Comm'n v. FERC, 576 F.3d 470, 477 (7th Cir. 2009), *reh'g denied*, 2009 U.S. App. LEXIS 24192 (7th Cir. 2009).

[78] *Id*. at 481 (Cudahy, J., concurring in part and dissenting in part).

[79] One casebook in the area, first published in 2000, recognizes that energy and environmental law began merging as early as the 1970s. *See* FRED BOSSELMAN ET AL., ENERGY, ECONOMICS AND THE ENVIRONMENT, at iii (Foundation Press, 2d ed. 2006).

siting of power plants—as well as decisions about fuel mix and power generation portfolios—were historically within the hands of state and local regulators. Not surprisingly, state and local regulators considering such decisions focus almost entirely on the benefits to their in-state customers. With adoption of a national RPS, regardless of whether it contains a significant mandate or focuses on REC market unification, it is unlikely that state regulators can continue to view such decisions entirely from the perspective of their own customers. As debate over the national RPS highlights, decisions as to what kind of plant to build and where to build it are no longer purely state and local issues and cannot be resolved without attention to regional and national goals.

As a legal matter, a national RPS on its own terms will not transform power plant siting and planning decisions from state and local issues into national ones. Once a national RPS is adopted, however, it seems inevitable that siting decisions for power plants will increasingly become regional issues, if not issues in which national concerns are regularly implicated. Professor Davies highlights how a national RPS can solve some Dormant Commerce Clause concerns presented by the most egregiously protectionist state RECs.[80] While parochial state REC subsidies appear to raise serious Dormant Commerce Clause issues, it is also interesting that many state REC programs that provide subsidies only to in-state producers have not actually been challenged—perhaps because the producers who would be most likely to challenge such laws frequently benefit from similarly parochial RECs in a neighboring state in the same region of the country. Even if this constitutional defect were cured by a national RPS, though, a national RPS coupled with national REC markets and the broader wholesale market will likely give rise to new Dormant Commerce Clause challenges to state regulation of siting and planning of power plants. It seems unlikely that expanding the relevance of a competitive market to energy developers will reduce constitutional challenges to the state regulations that continue to impose a formidable barrier to the development of renewable energy projects.

Moreover, if a national RPS were to be adopted, it seems inevitable that firms will increasingly see federal or regional evaluation of fuel mix in the production of electric power. Looking to the future of energy law in a post-national RPS world, a new apparatus to facilitate regional or federal override of state siting of new plants may be necessary in instances in which state or local governments fail to approve them. Already, this is beginning to happen at the regional level, as RTOs have taken an active interest in the planning of infrastructure to encourage renewable power

[80] Davies, *supra* note 5, at 1368.

projects.[81] Regional bodies may ultimately be able to handle the complex coordination issues that arise when individual states refuse to approve power plants to meet broader interstate interests, but as with transmission in the future, additional proposals to expand regional or federal authority over the planning and siting of power plants will prove necessary. At a minimum, once a national RPS is adopted, the concerns regarding a utility's fuel mix and generation portfolio will have changed from a matter of traditional state interest to a regional or national issue. Such changes could effectuate a radical reorientation of how the balance of national power plays out in energy law—a reorientation that the RPS itself does not achieve and that advocates of a strong national RPS have not yet fully anticipated.

V. CONCLUSION

Debates about energy policy frequently conflate the mandate and market unification aspects of a national RPS. Even if a national RPS does not contain a mandate, promoting market unification through national renewable credits can provide many benefits to existing national developers of renewable energy—by curing problems associated with leakage in state regulation and promoting the use of renewable energy credits. I agree with Professor Davies' analysis to the extent that he is arguing for a nationally unified renewable credit market. By adopting market unification for renewable credits, Congress can promote the stability of state regulation and encourage each state to take an ambitious approach to promoting renewables that is tailored to its regional situation.

Professor Davies and other strong advocates for a national RPS, however, oversell other aspects of a national RPS mandate for renewable sources of electric power. Market unification of RECs can be disentangled from a nationwide RPS mandate. Effectively, a national mandate has the effect of a tax, and to call it something else does not solve the highly contentious distributional issues it presents, or mask that it may not be the most efficient lever to induce technological change in the energy industry. Geography matters to any regulatory approach that encourages the development of renewable resources, and it cannot be expected that policies to significantly advance renewable project development will have uniform costs and benefits across states and regions of the United States. An RPS mandate would change firm behavior and would have

[81] RTOs have taken an active role in planning and facilitating cost spreading for new transmission infrastructure to serve renewables, especially wind. While some assert that membership in an RTO promotes development of renewables, the only empirical study to date calls this claim into question. Kathleen Spees & Lester Lave, *Do RTOs Promote Renewables? A Study of State-Level Data over Time* 33 (U.S. Ass'n for Energy Econ., Working Paper 08-007, 2008), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1085051.

substitutability effects that could undermine the very goals an RPS purports to advance. And even if a national RPS is adopted, renewable projects will continue to face enormous legal and regulatory barriers, particularly relating to project siting, transmission capacity, and cost allocation. If a national RPS extends a mandate to states that currently do not have one without also paying attention to issues such as who pays for the RPS, the pricing of carbon, and federal or regional management of siting and fuel mix, the larger goals of a national RPS will remain elusive.

A national RPS mandate on its own would accomplish little more than a symbolic victory for advocates of renewable energy and climate change mitigation. Of course there is hope that expressive legislation in this context may be useful in shaping public attitudes and, over time, changing social norms.[82] As I have argued in this Commentary Article, however, a national RPS mandate can change firm and industry behavior in ways that will present unintended consequences. It also distracts policy makers from addressing the tangible legal, regulatory, and economic obstacles faced by developers of renewable power projects. A more comprehensive approach to energy policy is the only way to ensure that a national RPS meets the full range of its stated goals. The simple reality is that the regulatory approach to achieving these goals needs to confront broader system-wide barriers to the development of renewable projects in the electric power industry than an RPS does.

[82] Cass R. Sunstein, *On the Expressive Function of Law*, 144 U. PA. L. REV. 2021, 2025 (1996).