FROM THE STATES UP: BUILDING A NATIONAL RENEWABLE ENERGY POLICY

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INTRODUCTION

In 2006, a U.S. Government Accountability Office (GAO) report concluded that "[r]educing the nation's dependence on oil and carbon dioxide emissions in the next 25 years is not unlike the 1960s challenge to put a man on the moon."[1] In fact, this analogy may be understated. While the scope of the two challenges is similarly daunting, the consequences of failure are potentially much more serious in the case of the energy challenge. One key component of addressing this challenge will be changing the ways in which the U.S. meets its seemingly insatiable electricity demand. The environmental, foreign policy, health, and national security costs of relying on fossil fuels to generate our nation's electricity are enormous. Not only are power plants responsible for approximately 40 percent of U.S. carbon dioxide emissions, they are also a major source of nitrous oxide, mercury, and sulfur dioxide emissions. Consequently, our high usage of power plants as a source of energy further entrenches our reliance upon fossil fuel sources located in some of the world's most geopolitically unstable regions.[2]

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[1] GOV'T ACCOUNTABILITY OFFICE, DEP'T OF ENERGY: KEY CHALLENGES REMAIN FOR DEVELOPING AND DEPLOYING ADVANCED ENERGY TECHNOLOGIES, GAO-07-106, at 53 (2006).

[2] Alan Nogee et al., *The Projected Impacts of a National Renewable Portfolio Standard*, 20:4 ELECTRICITY J. 33, 43–44 (2007); *see also* Matt Bivens, *Fighting for America's Energy Independence*, 23 J. OF PUB. HEALTH POL'Y 471, 474 (2002). *See generally* TONY DUTZIK ET AL., REAPING THE REWARDS: HOW

In contrast, renewable energy has the potential to play a pivotal role in addressing our nation's energy challenge by providing a clean, domestic substitute for foreign, polluting fossil fuels. In concert with energy efficiency policies to reduce United States's energy demand, an increase in the use of renewable energy will be one critical component of altering the country's energy mix and addressing climate change. But some thirty years after the U.S. first began promoting renewable energy, we have a woefully underdeveloped national strategy.[3] Many states have stepped in to fill this national void by adopting their own renewable energy strategies. Most significantly, twenty-five states and the District of Columbia have adopted Renewable Portfolio Standards (RPS) that mandate that utilities purchase a certain percentage or amount of their power from renewable sources. However, it seems unlikely that such policies can keep pace with national energy demand so as to significantly change the national energy mix. Whereas some have argued that states should continue their "race to the top" as the primary policy engine for renewable energy growth,[4] this paper argues the opposite: the federal government is uniquely positioned to bring about a large-scale change in our electricity supply efficiently and effectively, and should do so by adopting a national RPS.

Part I of this paper outlines why we should regulate renewable energy, current policies and their effectiveness, and why an RPS is the U.S.'s most promising future policy option. Part II discusses federalism and renewable energy, identifying key reasons that the federal government should be at the forefront of renewable energy policy through adoption of a national RPS. Part III suggests a strategy for moving forward on a national RPS and discusses the interactions of renewable energy and climate change policy.

STATE RENEWABLE ELECTRICITY STANDARDS ARE CUTTING POLLUTION, SAVING MONEY, CREATING JOBS AND FUELING A CLEAN ENERGY BOOM (U.S. PIRG Education Fund 2007).

[3] *See* Sanya Carleyolsen, *Tangled in the Wires: An Assessment of the Existing U.S. Renewable Energy Legal Framework*, 46 NAT. RESOURCES J. 759, 791 (2006) ("The dearth of strict, mandatory enforcement measures for renewable energy deployment is difficult to overlook.").

[4] *See, e.g.*, Mary Ann Ralls, *Congress Got it Right: There's No Need to Mandate Renewable Portfolio Standards*, 27 ENERGY L. J. 451, 451(2006).

I. BACKGROUND

A. *Renewable Energy Merits Government Promotion*

Most basically, renewable energy is electricity generated from sources that are inexhaustible or quickly replenish themselves. The five most common types of renewable energy are biomass, hydropower, geothermal, wind, and solar energy.[5] A particular renewable energy policy may also support more controversial sources—for example, Pennsylvania's RPS includes clean coal and Maryland's RPS includes poultry litter incineration.[6] However, the decision to be more inclusive often draws criticism for promoting sources that are less than truly renewable or less sustainable than other options.[7] Less controversially, energy efficiency can also be included in an RPS, thereby crediting reductions in demand alongside shifts in supply.[8]

Renewable energy's benefits are myriad. Most importantly, it largely eliminates the air emissions caused by conventional electricity sources. Moreover, by acting as a substitute to coal and natural gas, renewable energy provides a more reliably priced electricity source and helps mitigate spikes in price volatility of conventional sources and reduce the national security costs associated with our current fossil fuel supply.[9] Finally, renewable

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[5] *See, e.g.*, ENERGY INFO. ADMIN., RENEWABLE ENERGY CONSUMPTION AND ELECTRICITY PRELIMINARY 2006 STATISTICS (2007), *available at* http://www.eia.doe.gov/cneaf/solar.renewables/page/prelim_trends/pretrends.pdf.

[6] *See* Mary Ann Ralls, *supra* note 4, at 468; BARRY G. RABE, RACE TO THE TOP: THE EXPANDING ROLE OF U.S. STATE RENEWABLE PORTFOLIO STANDARDS 18 (PEW CTR. ON GLOBAL CLIMATE CHANGE 2006).

[7] *See, e.g.*, Nogee et al., *supra* note 2, at 45. Of course, there are critics even of the resources that are traditionally considered renewable—for example, wind energy has experienced many siting challenges due to worries over harm to birds and its impacts on sightlines. *See* Peter A. Groothuis et al., *Green vs. Green: Measuring the Compensation Required to Site Electrical Generation Windmills in a Viewshed*, 36 ENERGY POL'Y 1545, 1545 (2008).

[8] Marilyn A. Brown et al., *Reduced Emissions and Lower Costs: Combining Renewable Energy and Energy Efficiency into a Sustainable Energy Portfolio Standard*, 20:4 ELECTRICITY J. 62, 64–65 (2007). However, a standardized and reliable measure of energy efficiency would be a critical prerequisite to its inclusion. *See* Kanako Tanaka, *Assessment of Energy Efficiency Performance Measures in Industry and Their Application for Policy*, 36 ENERGY POL'Y 2887, 2887 (2008).

[9] Benjamin K. Sovacool & Christopher Cooper, *Green Means 'Go?'—A Colorful Approach to a U.S. Renewable Portfolio Standard*, 19:7 ELECTRICITY J. 19, 27 (2006); Nogee et al., *supra* note 2, at 43, 45.

energy can act as an engine for economic growth—as a labor intensive industry, it generates nearly twice as many jobs as fossil fuel electricity generation and keeps more cash in local, often rural, economies by cutting expenditures on foreign fuel inputs.[10] These benefits, coupled with the increasingly unacceptable costs of fossil fuel electricity generation, make renewable energy an even more appealing and important component of changing the country's energy mix. However, these benefits are undervalued by an electricity market that does not reflect the true worth of renewables in its prices, making government promotion of renewables critical to level the playing field.[11] The policy options currently being used, and those that could form the basis of a more robust future renewables' strategy, are the focus of the next two subsections.

[10] Nogee et al., *supra* note 2, at 42–43.

[11] Other than large hydropower, wind is the only renewable technology that currently has the potential, in ideal conditions, to compete cost-wise with traditional power sources. Wind's costs have fallen recently to under five cents per kilowatt-hour (kWh), which is comparable with the cost of new coal and natural gas generation facilities. *See* AMERICAN WIND ENERGY ASS'N, WIND ENERGY COSTS, http://www.awea.org/faq/cost.html (last visited June 14, 2008). However, this cost includes the federal production tax credit of 1.9 cents/kWh that wind will receive at least through the end of 2008. *Id.* Thus, unsubsidized wind is still not competitive with (subsidized) fossil fuel generation. Solar is still considerably more expensive: recent estimates of the cost of residential solar are around 37 cents/kWh hour, though industrial solar is less expensive due to larger scale, as low as 21.3 cents/kWh. *See* SOLARBUZZ, SOLAR ELECTRICITY PRICES, http://www.solarbuzz.com/SolarPrices.htm (last visited Feb. 21, 2008). Electricity produced from wood biomass is nearing competitiveness, with costs as low as 6 cents/kWh. *See* David Pimental, *Weighing in on Renewable Energy Efficiency*, GEOTIMES, (2005), http://www.geotimes.org/aug05/feature_pimental.html.

A number of market failures contribute to renewable energy's difficulties in competing with fossil fuels: the large historical and continuing subsidization of conventional energy sources; relatively low levels of research and development (R&D) investment in renewable energies over the last few decades; negative externalities of fossil fuel generation that are not included in the costs that consumers pay; national security costs of maintaining a steady supply of fossil fuels from politically volatile regions of the world; and the relative immaturity of renewable energy technologies, whose costs should fall as more experience is gained and economies of scale are reached. *See* NORMAN MYERS & JENNIFER KENT, PERVERSE SUBSIDIES 70 (2001); GOV'T ACCOUNTABILITY OFFICE, *supra* note 1, at 2–3; Bivens, *supra* note 2, at 474; Nogee et al., *supra* note 2, at 38.

B. *Current Policies Are Inadequate to Change the Energy Supply Mix*

Though the federal government, beginning in the 1970s, took aggressive early action to promote renewables, more recently state-level policies have begun to dwarf federal efforts. The federal government's current renewable energy policies include an accelerated five-year depreciation schedule for renewable energy generators (the only major remaining driver from the 1978 Public Utilities Regulatory Act, the original federal catalyst for renewable energy);[12] the production tax credit (PTC), which gives qualifying renewable energy generators a tax credit of 2.0 cents/kWh of renewable energy generated during its first ten years of operation;[13] a Renewable Energy Production Incentive (REPI), analogous to the PTC, that gives cash production incentives to publicly owned utilities and cooperatives that are unable to take advantage of tax incentives;[14] and more recently, Clean Renewable Energy Bonds (CREBs), which are interest-free bonds that electricity cooperatives and municipalities can use to finance renewable energy projects.[15] However, the PTC, REPI, and CREBs have been heavily criticized for their temporary nature—they depend upon short-term legislative extensions and Congressional appropriations such that they cannot be relied upon in long-term renewable project financing.[16] The federal government also continues its more traditional role in energy research and development, though funding for such research shrunk by 85 percent in real terms between 1978 and 2005.[17] Overall, the effect of these federal policies is relatively meager—the GAO has critiqued the federal government's renewable energy

[12] *See* Fredric C. Menz, *Green Electricity Policies in the United States: Case Study*, 33 ENERGY POL'Y 2398, 2402 (2005); Lori Bird et al., *Policies and Market Factors Driving Wind Power Development in the United States*, 33 ENERGY POL'Y 1397, 1399 (2005); 16 U.S.C. § 824a-3 (2006).

[13] *See* 26 U.S.C. § 45 (2000); Bird et al., *supra* note 12, at 1398; Carleyolsen, *supra* note 3, at 771; AM. WIND ENERGY ASS'N, PRODUCTION TAX CREDIT EXTENSION, http://www.awea.org/legislative/ (last visited Sept. 26, 2008).

[14] Bird et al., *supra* note 12, at 1398–99.

[15] NEW ENGLAND ROUNDTABLE ON FEDERAL RENEWABLE ENERGY POLICY, GROWING RENEWABLE ENERGY: RECOMMENDATIONS FROM NEW ENGLAND 12 (2005).

[16] *See id.* at 12; Bird et al., *supra* note 12, at 1399; Carleyolsen, *supra* note 3, at 771; GOV'T ACCOUNTABILITY OFFICE, *supra* note 1, at 3.

[17] GOV'T ACCOUNTABILITY OFFICE, *supra* note 1, at 5.

policies as "unlikely. . . .[to] be sufficient to deploy alternative energy sources in the next 25 years that will reverse our growing dependence on imported oil or the adverse environmental effects of using conventional fossil energy."[18]

Fortunately, states have stepped in to fill the federal void in renewable energy policy. By far the most effective state strategy is a mandatory renewable energy purchase requirement, which twenty-five states and the District of Columbia have adopted through RPS.[19] An RPS requires electricity suppliers to ensure that a certain percentage or a certain absolute amount of the electricity they are supplying to consumers comes from renewable energy sources.[20] However, though all states have chosen the same basic policy mechanism, RPS design details vary substantially by state and, as a result of these variations, state experiences are mixed in terms of actual impacts on renewable energy generation.[21] While this paper will not explore the nuances of state RPS designs in detail, it is helpful to note that designs vary in such basic elements as the type of renewable resources that are eligible, the stringency of targets (ranging from 2–30% and varying by the year in which they are imposed), the way in which targets and compliance are measured and verified, the rules regarding whether or not credits can be carried over from year to year, and the penalties for non-compliance.[22] One noteworthy feature of most state RPS is that they measure utilities' compliance with their obligations through Renewable Energy Credits (RECs), which are awarded to renewable energy producers on the basis of the number of kWh or

[18] *Id.* at 53.

[19] *See* Bird et al., *supra* note 12, at 1400; N.C. SOLAR CTR., RENEWABLES PORTFOLIO STANDARDS (2008), *available at* http://www.dsireusa.org/library/includes/topic.cfm?TopicCategoryID=6&CurrentPageID=10&EE=1&RE=1 (follow link for "Renewables Portfolio Standards"). The states with RPS are WA, OR, NV, CA, AZ, NM, HI, TX, MT, CO, IA, IL, WI, MN, NC, ME, NH, MA, RI, CT, NY, NJ, PA, MD, DE, and DC.

[20] Ryan Wiser et al., *Renewable Portfolio Standards: A Factual Introduction to Experience from the United States* 3 (LAWRENCE BERKELEY NAT'L LAB. 2007). For example, California is requiring 20 percent of its electricity to come from renewable sources by 2010; Texas is requiring 5880 MW by 2015. *See* N.C. SOLAR CTR., *supra* note 19.

[21] Wiser et al., *supra* note 20, at 4.

[22] *See, e.g.*, *id.* at 4–6; Karlynn S. Cory & Blair G. Swezey, *Renewable Portfolio Standards in the States: Balancing Goals and Rules*, 20:4 ELECTRICITY J. 21, 26–31 (2007); Benjamin K. Sovacool & Christopher Cooper, *Big* Is *Beautiful: The Case for Federal Leadership on a National Renewable Portfolio Standard*, 20:4 ELECTRICITY J. 48, 50–51 (2007).

MWh of renewable energy produced and that recipients can trade or sell to provide a separate income stream from the actual electricity produced and sold.[23] However, each state's RECs are different, which means that RECs cannot currently be traded from state to state, though some regional trading networks are currently being developed.[24]

Overall, state RPS and other state-level financial incentives, information-based strategies, and regulations represent a clear statement that states will not stand by while the federal government leads the country to an unsustainable energy future. Nevertheless, even with these laudable policies in place at the state level, the prognosis for renewable energy's ability to meet a significant portion of future projected U.S. electricity demand is disappointing. The mix of energy used in the U.S. has changed very little since the country first became interested in renewable energy in the 1970s, and our reliance on fossil fuel sources will be further entrenched rather than lessened in the next twenty years absent a major policy change.[25] In its 2007 Renewable Energy Outlook, the Energy Information Administration projected that the percentage of U.S. electricity generation supplied by non-hydropower renewable energy will increase from 2.3 percent in 2006 to 3.6 percent in 2030—a very modest improvement over twenty-five years.[26] Even if all state RPS policies currently in place were to be fully implemented, the amount of renewable energy generation predicted by 2030 would be only 4.6 percent of national energy generation—certainly an improvement, but not significant enough to change the country's energy supply mix so as to address climate change and the myriad other problems of fossil fuel electricity generation.[27] These numbers suggest that major

[23] Cory & Swezey, *supra* note 22, at 22; *see* Christopher B. Berendt, *A State-Based Approach to Building a Liquid National Market for Renewable Energy Certificates: The REC-EX Model*, 19:5 ELECTRICITY J. 54, 55 (2006). RECs are important in helping to reduce the costs of complying with an RPS policy—utilities are simply required to have enough RECs to cover their percentage obligation each year, and do not have to directly purchase or generate all of the renewable energy needed to meet their obligation. Cory & Swezey, *supra* note 22, at 22.

[24] *See* Sovacool & Cooper, *supra* note 9, at 24.

[25] *See* GOV'T ACCOUNTABILITY OFFICE, *supra* note 1, at 1.

[26] ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2007 86 (2007). For reference, a MWh is the equivalent of powering approximately 750 households for one hour. GOV'T ACCOUNTABILITY OFFICE, *supra* note 1, at 2.

[27] ENERGY INFO. ADMIN., *supra* note 26, at 87.

policy innovations will be necessary if the U.S. is genuine about its desire to shift from fossil fuel energy sources to renewable energy sources and to reap the attendant benefits.

C. *Policy Options: An RPS Presents the Best Model for the U.S.*

An RPS is not the only policy design option for promoting renewables. Voluntary green purchase programs, tax incentives, informational strategies, and production credits like the PTC are all policy options, but these are unlikely to create enough demand to drive up dramatically the supply of renewable energy on their own.[28] More robust policy options include a carbon dioxide cap-and-trade system and the European model of a feed-in tariff. This subsection compares these two options to an RPS to suggest that the best option for an aggressive U.S. renewables policy is an RPS coupled with a federal carbon cap-and-trade policy.[29]

A federal cap-and-trade system for carbon dioxide seems likely to be adopted in the next several years,[30] and several regional cap-and-trade models are being implemented in the interim.[31] While these programs will benefit renewables, they should work in concert with an RPS rather than as a replacement. Renewables form a critical component of most climate change strategies because absent completely eliminating electricity demand, new sources of energy to replace highly polluting fossil fuel power plants are essential. While a cap-and-trade system on

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[28] *See* 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 (2005).

[29] The interaction between an RPS policy and a federal cap-and-trade program for carbon dioxide are discussed more thoroughly *infra*, Part III.

[30] The vast majority of recent Congressional proposals for climate change legislation are cap-and-trade policies. *See, e.g.*, America's Climate Security Act of 2007, S.2191, 110th Cong. (2007); Climate Stewardship Act of 2007, H.R. 620, 110th Cong, (2007); Electric Utility Cap and Trade Act of 2007, S. 317, 110th Cong. (2007); Safe Climate Act of 2007, H.R. 1590, 110th Cong. (2007).

[31] For example, the Northeast's Regional Greenhouse Gas Initiative will auction its first allowances in September 2008 and go into effect in January, 2009. *See* REGIONAL GREENHOUSE GAS INITIATIVE, DESIGN ELEMENTS FOR REGIONAL ALLOWANCE AUCTIONS UNDER THE REGIONAL GREENHOUSE GAS INITIATIVE (2008), *available at* http://www.rggi.org/docs/20080317auction_design.pdf; REGIONAL GREENHOUSE GAS INITIATIVE, STATES CONDUCT FIRST-IN-THE-NATION AUCTION OF CARBON DIOXIDE ALLOWANCES 1–2 (2008), *available at* http://www.rggi.org/docs/rggi_press_9_25_2008.pdf (explaining that all participating states will have implementing legislation in place by Jan. 1, 2009 so as to have the program begin running in 2009).

its own would help to promote more renewable energy by raising the price of conventional energy, it would not necessarily promote an optimum level of renewable energy because it would not capture, in its pricing of carbon dioxide, the additional benefits of renewable energy including lessened dependence on foreign fossil fuel supplies, heightened national security, overall cleaner air, and local and rural job creation.[32] Thus, an RPS represents renewable energy as a particularly viable and vital alternative to fossil fuel energy generation, not simply as an equal to all other carbon-free energy sources. Moreover, an RPS policy that accelerates the development of renewables and drives down their costs will be critical in lowering the compliance costs of a cap-and-trade policy—"[t]he availability of advanced, low-carbon technologies is crucial to minimizing the cost of achieving GHG reductions."[33]

A separate alternative to an RPS is a feed-in tariff, a policy used by many European countries (though many others use RPS-type policies).[34] Whereas RPS policies set an overall quota and allow the market to determine the price, feed-in tariffs set a guaranteed price that utilities must pay for any renewable energy offered into the grid, and thus leave the amount of supply up to the market.[35] There is considerable debate in Europe over which policy is more effective.[36] While a feed-in tariff gives renewable energy producers investment confidence by setting a guaranteed price, it leaves unknown the ultimate amount of renewable energy that will be produced.[37] Moreover, it may not create large incentives for innovation and cost-effectiveness, because producers do not have to compete with each other to produce renewables at the lowest cost.[38] The choice of an RPS model, while offering less investor certainty as to future prices, offers distinct cost advantages by requiring renewable energy producers

[32] *See* Stine Grenaa Jensen & Klaus Skytte, *Simultaneous Attainment of Energy Goals by Means of Green Certificates and Emission Permits*, 31 ENERGY POL'Y 63, 64 (2003).

[33] PEW CTR. ON GLOBAL CLIMATE CHANGE, INSIGHTS FROM MODELING ANALYSES OF THE LIEBERMAN-WARNER CLIMATE SECURITY ACT 2 (2008).

[34] *See* 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, 3 (2006).

[35] *Id.* at 6.

[36] *Id.* at 7, 12.

[37] *Id.* at 7–8.

[38] *Id*.

to compete to sell certificates at lowest cost in the RECs market, and also ensures a guaranteed demand for renewable energy.[39] The cost-effectiveness of an RPS policy, when compared to a feed-in tariff, makes it particularly attractive as a national model in the U.S. where there would otherwise be the potential for major cost differentials among regions and states.

In any case, the U.S. seems to have escaped the dichotomous policy development occurring in Europe, with all U.S. states that have adopted major renewables legislation opting for an RPS.[40] This "path dependence," whereby states have chosen to adopt (and often adapt) the same model chosen by earlier-acting states, may be quite positive: the many states that have experimented with differing RPS have amassed a good deal of knowledge on how such a system is best designed and administered.[41] The next section of this paper argues that it is time to take the knowledge gleaned from this state experimentation with RPS and apply it to the creation of a national RPS.

II. THE U.S. NEEDS A NATIONAL RENEWABLE PORTFOLIO STANDARD

On December 7, 2007, the U.S. Senate rejected a cloture motion 53-42 that would have brought a federal RPS to a full vote, as part of the Energy Independence and Security Act of 2007.[42] The Senate's rejection of an RPS in this bill marked the eighteenth time in the last ten years that federal legislation to establish a national RPS has failed, largely based on the justification that a national RPS would be fundamentally unfair to those states that are less well endowed with renewable energy resources.[43] But this

[39] *Id.* at 8–9.

[40] *See, e.g.*, Sovacool & Cooper, *supra* note 22, at 58 (discussing features of U.S. states' renewables policies); *see also* N.C. SOLAR CTR., *supra* note 19 (illustrating the states that have adopted RPS); Doran, *supra* note 28, at 107 (noting that RPS have been hailed as the most popular and successful measure that states are taking with respect to renewable energy).

[41] *See, e.g.*, *id.* at 55–58; Doran, *supra* note 28, at 116; Brown, York, & Kushler, *supra* note 8, at 62; RABE, *supra* note 6, at 24 ("[S]tates are clearly learning lessons from one another . . .").

[42] 153 CONG. REC. S15,009 (daily ed. Dec. 7, 2007).

[43] *See* Sovacool & Cooper, *supra* note 22, at 48–49; Anne C. Mulkern, *Renewable-Energy Standard Included in Capitol Hill Bill*, DENVER POST, Dec. 4, 2007, at B1 (expressing Sen. Allard's disagreement with a single national standard although he supports Colorado's RPS); 153 CONG. REC. H14,263 (daily

critique of a national RPS is misguided and masks a central truth: a federal RPS is the most efficient and effective way to build a sustainable energy future in the U.S., and a well-designed policy can minimize disproportionate impacts such that these impacts do not act as a roadblock for an otherwise sound and important policy. This section takes three key arguments that scholars generally make in favor of federal regulation and applies them to the field of renewable energy: public good attributes, ecologies of scale, and economies of scale.[44]

A. *Renewable Energy Is a National Public Good*

One reason that the U.S. needs a national RPS rather than scattered state RPS is that renewable energy is a public good—its promotion by some states "provide[s] non-excludable benefits to residents in other states" that make it likely to be under-provided by any particular state.[45] In the case of public goods, some states become free riders that take no action themselves yet benefit from action taken in other states.[46] As discussed *supra*, renewable energy's myriad benefits include reduced national security and military costs, lower and more stable national fossil fuel prices, and reduced carbon dioxide and other pollution benefits. While some of the economic benefits of renewable energy may be felt locally, many of these benefits are national and international in scope. Thus, while ratepayers in twenty-five states bear the costs of supporting renewable energy through RPS policies, ratepayers in twenty-five remaining states reap many of the benefits of renewable energy while enjoying artificially low electricity prices that actually increase their demand, contrary to the public good.[47] While RPS states may enjoy some internal benefits of greater renewable energy usage and may even be willing to advance altruistically the goals of the country by promoting renewable

ed. Dec. 6, 2007) (statement of Rep. Sullivan).

[44] *See, e.g.*, Jonathan H. Adler, *Jurisdictional Mismatch in Environmental Federalism*, 14 N.Y.U. ENVTL. L.J. 130, 132, 143 (2006). Though Adler argues that the federalist structure of the U.S. government creates a presumption in favor of state regulation, this presumption is rebuttable and "can be overcome in any specific policy context by demonstrating the need for federal intervention." *Id.*

[45] *See id.* at 143 (arguing that public goods present one situation where federal policies may be necessary).

[46] Sovacool & Cooper, *supra* note 22, at 49.

[47] *Id.*

energy on a scale that goes beyond internal benefits, ultimately no 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.

B. *Ecologies of Scale: The Interstate Electricity System Creates the Need for a National Response to Match Energy Supply and Demand Across States*

A second reason that a federal RPS is preferable is that the scale of the U.S. electricity infrastructure and electricity industry spans state bounds. The result of this interstate infrastructure is that individual states cannot make forward-looking, comprehensive regulations that ensure an adequate match of renewable energy supply and demand in the future. As Jonathan Adler posits in his article *Jurisdictional Mismatch in Environmental Federalism*, environmental problems should be addressed through "ecologies of scale," whereby environmental problems are regulated by institutions that exist at the same scope as the problem in question to create the most efficient regulation.[48] In the case of electricity generation, the infrastructure that makes up our national electricity supply and delivery system is decidedly interstate: transmission lines cross state bounds, the wholesale electricity market typically spans several states, and most utilities hold generation capacity in more than one state. This interstate scale raises several problems for state-level RPS.

One problem that our interstate transmission system creates for state RPS is that it is physically at odds with current state-level policies. Many states set geographic restrictions where renewable energy that counts towards their targets can be generated, or limit the interstate trade of RECs to meet renewable energy targets in ways that might be unconstitutional.[49] Though such restrictions are logical for states that want to subsidize local renewable energy producers, they risk running afoul of the dormant commerce clause by discriminating against out of state renewable energy producers.[50] While no policies have yet been challenged in court,

[48] Adler, *supra* note 44, at 133.

[49] *See* Sovacool & Cooper, *supra* note 22, at 53–54.

[50] *See id.*; Steven Ferrey, *Renewable Orphans: Adopting Legal Renewable Standards at the State Level*, ELECTRICITY J., Mar. 2006, at 55–57. Texas and Nevada may be particularly vulnerable to constitutional challenges—they each confine acceptable imports of renewable electricity to those that arrive via a

the possible unconstitutionality of these restrictions creates a risky regulatory environment that threatens the stability of the renewable energy market for investors and producers.[51] In contrast, a single federal market would alleviate legal uncertainties and provide a match of regulatory scope in line with the interstate scale of electricity transmission.

Moreover, there is currently a serious difficulty in the interplay between interstate transmission and state RPS—the supply of renewable energy cannot keep up with the demand generated by state RPS because of a backlog in interconnection requests at the regional level.[52] This backlog means that even with RPS policies generating accelerated demand for renewable energy, there may not be enough supply available to meet this growing demand absent higher-level solutions to expedite the supply and interconnection of renewables to the grid.[53]

These problems of scale present another reason that renewable energy promotion might function better at the national level. A federal RPS, coupled with current federal jurisdiction over access to transmission lines, would provide a "logical nexus" between supply and demand of renewable energy.[54] With an overarching federal RPS in place, there would be a more stable, predictable level of renewable energy demand that would occur at the same level of government as the planning of long-term renewable energy supply and interconnections.

C. *Economies of Scale: We Could Reap Major Efficiency Gains from a National RPS*

Economies of scale provide the final critical justification for a national RPS—federal government regulation often creates efficiency by having a single federal standard that replaces a "multiplicity of state standards," thereby lowering compliance

dedicated transmission line. RABE, *supra* note 6, at 25.

[51] Sovacool & Cooper, *supra* note 22, at 53–54.

[52] *See State RPS Policies Creating Log Jam in Interconnection Requests*, ENERGY WASHINGTON WEEK, Dec. 19, 2007.

[53] BLAIR SWEEZEY ET AL., NAT'L RENEWABLE ENERGY LAB., A PRELIMINARY EXAMINATION OF THE SUPPLY AND DEMAND BALANCE FOR RENEWABLE ELECTRICITY 8 (2007), *available at* http://www.nrel.gov/docs/fy08osti/42266.pdf.

[54] *See Kelly Backs Kelliher on Enforcement, Pushes Clean Energy Transmission Up Priority List*, INSIDE F.E.R.C., Dec. 3, 2007.

costs.[55] While a national RPS would not necessarily pre-empt states from setting more stringent state-level targets or including additional renewable energy sources, it would eliminate the proliferation of state RECs markets and merge these into a single national trading market that would facilitate least-cost compliance with the federal RPS.[56] Currently, state RPS are accompanied by their own RECs markets that vary in price, eligible resources, market rules, and size such that there is no fungibility among the RECs of different states.[57] In contrast, the creation of a national RECs market would decrease compliance costs in states that already have RPS, and would allow states that have not yet adopted an RPS, often due to a claimed lack of renewable resources, to meet a federal RPS as cost-effectively as possible.

If a national trading market for RECs were created, a national price for renewable energy support would emerge and renewable generation would be built in whichever area of the country had the most cost-effective resources.[58] This would lead to efficiency gains in the RECs markets and relieve the concerns of resource-poor states that they will face enormously high relative compliance costs—when utilities buy RECs from a single national market, all states should face leveled compliance costs.[59] Moreover, a national market would create a more certain, stable exchange by standardizing definitions of renewable energy, harmonizing accounting principles for issuing and tracking RECs, and amassing a large enough market to prevent severe price fluctuations.[60] Finally, with renewable energy production happening on a larger national scale, we can expect its costs and prices to drop more quickly, as large-scale investment and economies of scale in production can help boost technological innovations that will make

[55] *See* Adler, *supra* note 44, at 145, 148. Some commentators suggest that a federal standard actually should pre-empt state standards in the interest of uniformity. *See, e.g.*, Sovacool & Cooper, *supra* note 22, at 55.

[56] *See* Sovacool & Cooper, *supra* note 22, at 57–58.

[57] Cory & Swezey, *supra* note 22, at 22; Berendt, *supra* note 23, at 57.

[58] *See* Pallab Mozumder & Achla Marathe, *Gains from an Integrated Market for Tradable Renewable Energy Credits*, 49 ECOLOGICAL ECON. 259, 264 (2004). Currently, the subsidy that is provided to renewable energy producers by the sale of RECs varies considerably—for example, a 2004 study found that California RECs provided renewables producers a price premium of 1.6 cents/kWh, while New York RECs provided a price premium of 4 cents/kWh. *Id.* at 265.

[59] *See id.* at 263.

[60] Nogree et al., *supra* note 2, at 35. *See* Berendt, *supra* note 23, at 55, 57; Wiser et al., *supra* note 20, at 11.

renewables more competitive with traditional energy sources.[61]

III. IT IS TIME TO MOVE FORWARD ON A NATIONAL RPS

> [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 energy ludicrously below its potential. The debate over a national RPS remains contentious even though many of the issues have been resolved by empirical data or can be avoided by structuring the program in a smart way.[62]

Given the enormous national challenge of moving towards a cleaner and more secure energy future, a more comprehensive national renewable energy strategy is vital. As more state-level RPS are adopted, issues of inter-state collaboration and the need for more coordinated action become more and more apparent: "one of the strongest cases against 'bottom-up' policy design in a federal system involves those situations in which multiple states fail to work cooperatively and instead establish a patchwork quilt of provisions that precludes interstate cooperation."[63] Moreover, a federal RPS policy is appealing for its clarity and predictability—it avoids David Schoenbrod's critique of federal environmental policy that Congress typically passes off impossible mandates to regulatory agencies.[64] Instead, at least in the latest proposed RPS, Congress set definitive targets and a clear timeline that utilities must follow.[65] A well-designed, clearly articulated RPS policy creates a national market with economies of scale that allow for promotion of renewable energy at the lowest overall cost to the country, and at a magnitude appropriate for the scope of the national problem.[66]

There are some questions that still need answering with regards to a federal RPS. One important issue is how a federal

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[61] *See* James McVeigh et al., *Winner, Loser, or Innocent Victim? Has Renewable Energy Performed as Expected?*, 68 SOLAR ENERGY 237, 237 (2000).

[62] Sovacool & Cooper, *supra* note 9, at 30.

[63] RABE, *supra* note 6, at 24.

[64] *See* DAVID SCHOENBROD, SAVING OUR ENVIRONMENT FROM WASHINGTON 8–9 (2005) (explaining Congress's trend of passing general statutes that order agencies to make specific rules, thus taking credit for addressing a problem while shifting blame for the costs and the possibility of failure to the agency).

[65] Energy Independence and Security Act of 2007, H.R. 6, 110th Cong. § 1401(a) (Engrossed Amendment as Agreed to by House).

[66] Nogee et al., *supra* note 2, at 35.

standard will interact with existing state standards—most states with RPS favor a federal standard that does not pre-empt more aggressive state standards, in which case the issues of dual compliance with federal and state systems must be negotiated.[67] Ultimately, though many states are opposed, the interest in national uniformity and the simplicity of a single standard might lead to a federal pre-emption provision, likely favored by utilities.

A second major challenge that must be overcome in implementing a national RPS is how to ensure that resource-poor states do not bear inequitable cost burdens.[68] Renewable energy comes from natural resource endowments that vary geographically and unevenly across the U.S.: the central U.S. (Kansas, Montana, Nebraska, North Dakota, Oklahoma, and Wyoming) has the best wind resources; California has 90 percent of the country's geothermal resources; and the southwest and the south Atlantic coast have the best solar technology potential.[69] Southern and coal-heavy states have been instrumental in blocking national RPS legislation because of worries that they stand to lose the most and gain the least from such a policy.[70] A national RPS may indeed raise electricity costs for consumers across the nation, though price increases are uncertain and projected to be minimal at worst.[71] And because of resource differences among regions, there are likely to be substantial cost differentials to producing renewable electricity in different places.[72] However, a national RECs market should work to equalize compliance costs across states, as utilities in resource-poor regions will choose to buy RECs from suppliers in

[67] *See* Wiser et al., *supra* note 20, at 14–15.

[68] *See, e.g.*, 153 CONG. REC. H14,263 (daily ed. Dec. 6, 2007) (statement of Rep. Sullivan).

[69] Menz, *supra* note 12, at 2400–01.

[70] *See, e.g.*, 153 Cong. Rec. S15,007 (daily ed. Dec. 7, 2007) (statement of Sen. McConnell).

[71] ENERGY INFORMATION ADMINISTRATION, IMPACTS OF A 15-PERCENT RENEWABLE PORTFOLIO STANDARD 8 (2007), *available at* http://tonto.eia.doe.gov/ftproot/service/sroiaf(2007)03.pdf. The EIA estimated in 2007 that a fifteen-percent federal RPS by 2030 would raise cumulative consumer expenditures on natural gas and electricity by 0.3 percent compared to the reference case. *Id. But see* ENERGY INFORMATION ADMINISTRATION, OIL AND NATURAL GAS MARKET SUPPLY AND RENEWABLE PORTFOLIO STANDARD IMPACTS OF SELECTED PROVISIONS OF H.R. 3221 8 (2007) (projecting slightly lower or unchanged cumulative residential energy expenditures under a 15 perecnt RPS proposed in the House of Representatives).

[72] *See* Mozumder & Marathe, *supra* note 58, at 262.

resource-rich areas.[73] This raises a separate concern, though—while a national RECs market may equalize compliance costs across the country, this equalization will occur because renewable generation will be built in the places it is cheapest. Thus, some states will disproportionately reap the advantages of local, green job creation and rural development. Resource poor states may feel that they are, in effect, paying a subsidy to those states that enjoy the most renewable generation development.[74]

There are, however, a few reasons that resource-poor states should not be overly concerned: first, electricity costs should become more equalized throughout the country due to Congress's recent repeal of the Public Utilities Company Holding Act (PUCHA) that restricted utility companies to certain geographic areas.[75] Since this time, utilities have begun diversifying their holdings throughout the U.S., lowering the impact that any one state's utilities will feel from a national RPS.[76] Second, by including energy efficiency as one of the eligible resources, the most recent federal RPS proposal helps make the RPS more equitable, as all states have low-cost energy efficiency improvements available.[77] Thus, if a federal RPS is ultimately adopted with generous energy efficiency options, all states should see positive local impacts in the form of new, green businesses in the energy efficiency field.[78]

A third issue that will have to be broached, given the likelihood that a national climate change strategy will be adopted in the next few years, is the ways in which a concomitant national climate change policy and an RPS would interact. An essential overlap exists between RECs and carbon allowances, in that RECs represent carbon reductions achieved from using renewable energy rather than conventional energy, and carbon allowances represent allowable emissions of carbon.[79] This overlap raises the question of whether a utility buying RECs, which represent kWhs of

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[73] *See id.* at 263–64.

[74] Ralls, *supra* note 4, at 467.

[75] Sovacool & Cooper, *supra* note 9, at 22.

[76] *Id.*

[77] Brown et al., *supra* note 8, at 64.

[78] *Id.*

[79] LORI BIRD ET AL., NAT'L RENEWABLE ENERGY LAB, IMPLICATIONS OF CARBON REGULATION FOR GREEN POWER MARKETS 30 (2007), *available at* http://www.nrel.gov/docs/fy07osti/41076.pdf.

renewably-produced electricity, must at the same time retire enough emissions allowances to match the emissions reductions achieved by this renewable energy.[80] If a utility does *not* have to retire emissions allowances to match its renewable energy purchases, then the renewable energy it purchased will not contribute to overall carbon dioxide reductions, as the utility can then sell its excess allowances that it has from buying renewable energy to other cap-and-trade participants.[81] If a utility *is* required to retire emissions allowances with its RECs, then RPS policies will result in additional emissions reductions beyond what is required under the cap-and-trade regime, but this will make compliance more expensive.[82] Essentially, a decision must be made as to whether RECs are to represent a separate, additional reduction in carbon dioxide emissions (in which case utilities should be required to retire a corresponding number of emissions allowances), or whether RECs should represent only those additional benefits of renewable energy *beyond* carbon emissions reductions (in which case utilities need not retire emissions allowances). Alternately, renewables' carbon reduction benefits could be recognized through rewarding renewable energy generators emissions allowances when the allowances are being distributed, thus crediting the emissions benefits that they provide under the cap-and-trade program.[83] However the market overlap is resolved, it is again apparent that a clear, uniform rule for how the two markets are to interact will be essential, and that federal administration of both markets would facilitate the regulation of the overlaps between them.

CONCLUSION

Ultimately, the challenges surrounding a national RPS are minor compared to the benefits that could be derived from implementing such a coordinated national strategy for promoting renewable energy. A national RPS would harness the most

[80] *Id.* at 31.

[81] *Id.*

[82] *Id.; see also* Karen Palmer & Dallas Burtraw, *Cost-Effectiveness of Renewable Electricity Policies*, 27 ENERGY ECON. 873, 891 (2005).

[83] Palmer & Burtra, *supra* note 82, at 891; *see* Elizabeth Lokey, *Valuing Renewable Energy in Emerging U.S. Carbon Markets*, ELECTRICITY J., July 2007, at 47–55, for a longer discussion of the ways in which the allocation method of carbon allowances might include and impact renewable energy.

efficient resources available in every part of the country and level compliance costs throughout the country with a national RECs market. Given the scale of the energy and environmental problems confronting the U.S. and the world, a more robust renewable energy policy is a critical part of achieving a more sustainable future energy supply and addressing climate change. While states taking the lead in renewable energy and increasingly in climate change policy is an important and meaningful first step, strong federal action is necessary to coherently, efficiently, and effectively address the pressing national and international challenges of a more sustainable and stable energy future.