Federalism in Renewable Energy Policy

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Responding to the desire for greater utilization of renewable domestic energy resources, state legislatures have implemented an array of policies encouraging the development of solar, wind, geothermal, and other renewable energy sources. Every state offers at least some form of policy incentive for renewable energy development, but the quantity and quality of the policy inducements available vary greatly across jurisdictions. At one end of the spectrum, California and Texas offer a plethora of incentives for an increasingly diverse range of renewable resources and utilization technologies. In contrast, states such as Oklahoma and Alabama have a paltry menu of incentives for developers of renewable energy resources.

Many states provide direct incentives for renewable energy development through tax credits, deductions, and exemptions, as well as grants and financing support. In large part, these policies mirror those available from the federal government. A majority of states also indirectly encourage renewable energy development through carbon pricing mechanisms, renewable energy portfolio standards, or net metering. These policy incentives, in contrast, have no federal counterparts.

This article examines these policies in detail, through a federalist lens, and aims to shed light on the ways in which the federal structure has influenced the development of renewable energy policy. We begin by describing state policies that directly promote renewable energy development, summarizing the types of incentives and their availability, and tracking their deployment throughout the states. We then similarly address indirect state incentives. Finally, we conclude by examining renewable energy policy from a federal perspective, assessing the ways in which federalism has influenced the development of renewable energy policy.

From this analysis it becomes clear that renewable energy policy richly illustrates the laboratory function of federalism. Early renewable energy policy developed through devolved federalism, with individual states innovating as isolated actors while other states and the federal government sat idle. After interest in renewable energy stagnated in the 1980s and 1990s, experimentation in the federalist laboratory again heated up, and many states were able to learn lessons from the policy experiments initiated in the 1970s. During this period, many states enacted policies encouraging renewable energy development. This resurgence of state renewable energy policy led to the adoption of federal policies closely tracking some of those deployed among the states.

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Direct State Encouragement

The most broadly used renewable energy development incentive is tax policy. Many states, like the federal government, use income tax credits and deductions for this purpose, along with sales and property tax programs, which have no federal equivalents. At the state level, the property tax is the most widely used. Incentives through the income tax are slightly less common than those through the sales tax, in part because some states have no income tax.

Twenty-four states encourage renewable energy projects through corporate and personal income tax credits and deductions; more than half of these states have adopted such incentives since 2000. West Virginia and Idaho provide tax incentives only for personal income, while Oklahoma, Missouri, and Vermont offer income tax incentives only for corporate income. For the most part, state income tax benefits largely parallel the income tax benefits available at the federal level.

Encouraging renewable energy development through income tax policy originated in the late 1970s, as a result of energy shortages resulting from the OPEC oil embargo that followed the Yom Kippur war of 1973. In 1977, North Carolina implemented aggressive personal and business income energy tax credits, allowing taxpayers a credit equal to 35 percent of the cost of installing wind, geothermal, solar, biomass, or hydroelectric energy systems. N.C. Gen. Stat. § 105-126.16A. At the same time, Oregon declared a state policy to encourage development of renewable resources. Or. Rev. Stat. §§ 469.010, 469.190. Pursuant to that policy, Oregon provided personal income tax credits to offset the costs of installing residential renewable energy systems. *Id.* §§ 316.116, 469.170. Texas followed suit in 1982, adopting corporate tax deductions for solar and wind systems. Tex. Tax Code § 171.107.

Massachusetts was the first state to deploy sales tax policy as a means of encouraging renewable energy development, exempting solar, wind, and geothermal equipment purchases from sales tax in 1977. New Jersey followed three years later with a sales tax exemption for solar equipment purchases. For the next two decades, sales tax incentives remained mostly stagnant as a policy tool. In 1993 Iowa exempted wind equipment; in 1997 Arizona exempted equipment for solar and wind. But, beginning in 1999, sales tax incentives gained popularity as a tool for encouraging renewable energy development. Today, twenty-eight states offer some form of sales tax exemption or refund for purchases of equipment used in renewable energy generation.

Some states, such as Nevada, offer a reduced sales tax on qualifying equipment purchases. Others, like Washington and Minnesota, exempt certain equipment from sales tax altogether. Only a minority of states offers total sales tax exemptions to all forms of renewable energy equipment purchases. Most instead restrict the incentive to a particular type of energy resource (e.g., solar or wind in Arizona); amount

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of electrical generating capacity (e.g., more than 100kW in North Dakota); or type of use (e.g., residential in New York).

Finally, states encourage development of renewable energy through property tax policy, typically by either abating or exempting from *ad valorem* taxation the value added by installation of renewable energy equipment. Indiana and Massachusetts pioneered this approach in 1975, exempting the added value of solar systems (Indiana) or solar, wind, and hydroelectric (Massachusetts). The following year Oregon provided a similar exemption for all types of renewable energy systems. Texas, Iowa, and New York all soon adopted analogous policies.

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As with sales taxes, property tax policy stagnated as an incentive during the 1980s and 1990s. Only Minnesota and Louisiana adopted property tax exemptions in 1990s. But, again like sales tax incentives, property tax incentives gained considerable popularity after 2000. Thirty-six states now offer some form of property tax exemption or abatement to encourage renewable energy development.

In addition to tax policy, fifteen states offer grants in varying forms to a range of qualifying applicants, typically commercial, industrial, utility, and government entities. As with income tax incentives, state grant programs are analogous to those of the federal government. But, unlike tax policies, state grants are a relatively recent creation, appearing in most states during the early 2000s.

Finally, states also offer various forms of financing support as a development tool. Some state programs, such as Idaho's Office of Energy Resources Loan Program and Montana's Alternative Energy Revolving Loan Fund, directly finance renewable energy projects. Others, such as Oregon's Green-Street Lending Program, offer below-market rate financing through public-private partnerships involving banks, utilities, and government entities. Still others, including New Mexico's Renewable Energy Bonding Act, allow for the issuance of public debt to finance public renewable energy projects.

Oregon was the first to utilize financing as a policy tool to encourage renewable energy development with its Small-Scale Energy Loan Program in 1980. For nearly the next decade, only Oregon directly supported financing of renewable energy projects, until Minnesota, Missouri, and Mississippi implemented renewable energy project financing programs in the late 1980s. Since then, the number of states offering financing support to renewable energy projects, the kinds of support available, and the types of projects eligible has grown considerably. Thirty-seven states and the federal government today offer some type of financing support for renewable energy development.

Indirect Incentives

Indirect incentives have taken a variety of forms and continue to evolve. Thirty-one states and the District of Columbia have adopted some form of renewable portfolio standard (RPS), requiring utilities to produce a specified fraction of their electricity from renewable sources, with another eight states employing voluntary renewable energy goals. Most states have enacted net-metering requirements providing retail credit to consumers for a portion of the electricity they generate. A handful of states and local governments have adopted or are considering feed-in tariffs (FITs) under which producers are paid a cost-based price for their renewable electricity. And a number of state and regional schemes (considered in more detail below) have emerged to price carbon emissions and create a market for trading emission credits.

Net-metering schemes abound and have certainly advanced renewable development, but their overall effect on renewable growth, while increasing, has been marginal in comparison to RPS programs. FITs are viewed by many as potentially effective but have seen limited use due largely to prohibitive provisions of the Public Utility Regulatory Policies Act of 1978 (PURPA) and the Federal Power Act of 1935 (FPA), which operate to limit the feasibility of, if not entirely preempt, state-level FITs.

Of the various state-level efforts, RPSs have been the primary impetus behind new renewable generation. In its basic form, an RPS establishes a renewable energy purchase obligation for retail electricity providers, expressed in megawatts (MW) or as a percentage, requiring those providers to obtain a specified minimum quantity of renewable energy and imposing some form of penalty for noncompliance. Typically, an RPS requires the provider to gradually increase the amount of renewable energy in its fuel supply until it reaches the specified target. Additionally, many RPS schemes create and allow for the trading of renewable energy credits or certificates to reduce compliance costs, allowing retail providers to demonstrate compliance by purchasing credits in lieu of electricity from renewable sources.

While a federal RPS has seen much debate and garnered a fair amount of traction, it is only at the state level that RPS policies have been implemented. In 1983, Iowa became the first state to implement an RPS with passage of its Alternative Energy Production Law. Iowa Code §§ 476.41–476.45. The law required investor-owned utilities to purchase a shared total of 105 MW per year of in-state renewable generating capacity. Iowa has since met the 105 MW goal and has moved to a voluntary target of 2015 MW by 2015. The Iowa RPS stood alone until the late 1990s when Nevada, New Jersey, Texas, and Wisconsin enacted their first RPS initiatives. A majority of states passed RPS legislation after 2000, in response to growing concern over the projected economic and environmental costs of climate change, as well as the need for job creation, diversification of energy sources, and improved air quality.

State RPS targets and standards are getting more stringent. While few standards adopted prior to 2005 called for greater than 10 percent renewable generation, the majority of those adopted since call for at least 20 percent renewable capacity

within the next decade. Texas's initial RPS, established in 1999, set 2,000 MW as a target to be achieved by 2009. Having reached that benchmark, the state is now working toward a new goal, set in 2005, for 5,880 MW by 2015. As of the end of 2008, total installed renewable capacity in Texas exceeded 7,100 MW.

Of the state RPSs, Michigan's and Wisconsin's call for the least renewable generation, albeit on a fairly short schedule, requiring 10 percent generation by 2015. Some other RPSs have a slightly higher target but allow more time to achieve that goal; for example, Massachusetts and Washington both have 15 percent as a target but allow until 2020 to reach the mark. Arizona also calls for 15 percent generation but not until 2025.

The most aggressive RPS was signed into law April 12, 2011, in California and requires California utilities to provide at least one-third of their electricity from renewable sources by 2020. Cal. Pub. Util. Code §§ 399.11–399.20. While the California RPS is the most aggressive in terms of both target and timing, a few other states are not far behind—Connecticut calls for 27 percent renewable generation by 2020; Minnesota requires that Xcel Energy, which generates about half of the state's electricity, obtain 30 percent of its power from renewable sources by 2025, while the rest of the state must meet 25 percent by 2025; Oregon requires that its largest utilities obtain 25 percent of their power from renewable sources by 2025; and Illinois also requires that 25 percent of its power derive from renewable sources by 2025.

Although the various RPSs present varying standards of both renewable generation and the aggressiveness with which the states attempt to meet their respective standards, it does appear the standards are driving the proliferation of renewable generation. Between 2001 and 2006, one-half of total wind energy installations were a product of state renewable standards. *See* Ryan Wiser et al., *Renewable Portfolio Standards: An Introduction to Experience from the United States*, Lawrence Berkeley National Laboratory, NCSL Clean Energy and Air Quality Working Group (May 3, 2007), *available at* http://eetd.lbl.gov/ea/ ems/reports/62569.pdf. Given existing standards, it is projected that state RPSs will provide almost 80,000 MW of new renewable power by 2025. Union of Concerned Scientists, *Renewable Electricity Standards at Work in the States*, (Feb. 2009), *available at* www.ucsusa.org/assets/documents/clean_energy/RES_ in_the_States_Update.pdf.

Net metering initiatives have also seen broad state-level acceptance. As of January 2011, some form of net metering was allowed in forty-five states and the District of Colombia. Unlike an RPS, net metering is a relatively simple policy option. Net metering effectively allows the electricity customer's meter to run backwards, crediting the customer for self-generated renewable electricity. Under net metering, one kilowatt-hour (kWh) of power generated by the customer has the exact same value as one kWh consumed. Net metering policies differ in many ways, but key differentiators include technologies considered eligible, an individual customer's capacity limits, and the amount of credit given for renewable generation.

Drivers of net metering initiatives include the improving economics of small-scale solar generation, as well as provisions of PURPA that assure private power producers the ability to sell power back to a utility at a cost known as "avoided cost," generally defined as the cost the utility would have incurred had it supplied the power itself or obtained it from another source. Iowa and Minnesota adopted the first net metering policies in the early 1980s. In the late 1990s, net metering policies began to see broader appeal—between 1996 and 2009, the number of states with a net metering policy went from six to more than forty. While recent studies indicate the existence of a state net metering policy correlates, over time, with increased nonhydroelectric renewable electricity generation, there is currently little evidence that the policy actually leads directly to increased renewable, particularly solar, development. The lack of evidence is due in part to the relative novelty of net metering policies, as well as the fact that net metering is often part of a broader policy package promoting renewable development. In any event, net metering policies have found a home in the majority of states and will likely continue to be a part of state indirect incentives.

FITs operate similarly to net metering, crediting the electricity customer for self-generation of renewable electricity. Unlike net metering, where a single meter runs forward for consumption and backward for generation, a FIT requires two meters, one to measure electricity consumed and one to measure electricity produced. The customer pays one price for power consumed and is paid a different, higher price, as set by the policy, for the renewable electricity produced and fed back into the system. FITs are less prevalent than net metering efforts due largely to uncertainty of the policy's legality under the FPA and PURPA, which preempt certain state feed-in tariff policies. Despite the uncertainty, a number of states, including Vermont, Oregon, Rhode Island, and Washington, and various cities, such as Gainesville, Florida, and Sacramento, California, have adopted some form of feed-in tariff, and many other states and municipalities are considering following suit.

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There are no corresponding federal-level RPS, net metering, or FIT programs in place or on the immediate horizon. The closest Congress has come to passing a carbon pricing and emissions trading scheme was the American Clean Energy and Security Act of 2009 (ACES). ACES was a robust cap-and-trade scheme that passed the U.S. House, but failed in the Senate. In the absence of a federal carbon pricing and emission credit trading scheme, several regional carbon pricing efforts have been born but have yet to generate significant renewable development. On the whole, carbon pricing efforts have seen relatively little acceptance and implementation.

The Regional Greenhouse Gas Initiative (RGGI), to date the most successful of the regional carbon control efforts, was launched in 2008 as a cap-and-trade program covering electricity generation in ten northeastern and mid-Atlantic states: Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, and Maryland. The program aims to achieve a 10 percent reduction in carbon dioxide emissions from power plants by 2018 through the auction of a limited number of tradable allowances that authorize the emission of one ton of carbon dioxide.

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While the first allowance was auctioned in September 2008 and the first three-year compliance period began January 1, 2009, many question the program's survival. In May 2011, New Jersey announced it would withdraw from the program by the end of 2011, and, later, at the June 2011 auction, 70 percent of the allowances offered were not sold despite the modest price tag of $1.89 per ton of carbon. However, the two most recent auctions—held in December of 2011 and March of 2012—were far more successful, selling nearly two-thirds of the allowances.

The Western Climate Initiative (WCI) of 2007 consists of seven western states—California, Arizona, New Mexico, Oregon, Washington, Utah, and Montana, and four Canadian provinces. The program set a regional greenhouse gas emissions target of 15 percent below 2005 levels by 2020 and establishes a market-based approach, such as a cap-and-trade program, to meet the goal. Today, the program's survival is also in doubt as all states save California have withdrawn from the WCI and the four Canadian provinces have not committed to implementation of a cap-and-trade scheme.

In November 2007, Illinois, Iowa, Kansas, Michigan, Minnesota, and Wisconsin and the Canadian province of Manitoba signed the Midwest Greenhouse Gas Reduction Accord. Much like the WCI, under the Accord the members agreed to set a regional greenhouse gas emission reduction target and develop a cap-and-trade system to achieve the target. While final Model Rules for the Accord were released in 2010, the program has yet to launch.

State Experimentation in the Federal System

The constitutional scholar Erwin Chemerinsky has identified "state experimentation" as one of the main functions served by the federalist division of political authority in the United States. Erwin Chemerinsky, Enhancing Government: Federalism for the 21st Century 99 (2009). State experimentation in the federal system has played a critical role in the development and deployment of renewable energy policy in the United States over the last four decades.

Where national consensus and preemptive federal law are lacking on a subject of policy, the individual states are allowed discretion to experiment. In that case, as Justice Louis Brandeis famously observed, "It is one of the happy incidents of the federal system that a single courageous State may, if its citizens choose, serve as a laboratory and try novel social and economic experiments without risk to the rest of the country." *New State Ice Co. v. Liebman*, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting). But the freedom to experiment is not without downsides. The greatest pitfall of localized experimentation is that the costs of innovation are carried locally, while the benefits are enjoyed nationally. Policy experiments produce knowledge of what does and does not work, and those benefits accrue to the entire nation at the expense of the state whose citizens are willing to assume the costs and risks of experimentation. This in turn creates a free-rider market failure: Many states will wait for others to take the lead as experimental laboratories, forgoing the costs and risks, while nonetheless enjoying the benefits that will follow. Malcolm M. Feeley & Edward L. Rubin, Federalism: Political Identity and Tragic Compromise 27 (2008).

Both the experimental function of federalism and the free-rider problem that flows from it are evident in the development of renewable energy policy. For each type of policy incentive to develop renewable energy, a small handful of states carried the initial burden of experimentation, producing benefits in turn for the nation as a whole. More than three decades ago, North Carolina, Oregon, and Texas pioneered the use of income tax policy to encourage renewable energy development. Today nearly half of the states have benefited from that innovation, now providing their own income tax benefits. The same is true for sales tax policies that encouraged renewable energy development. In the late 1970s and early 1980s Massachusetts and New Jersey experimented with sales tax as a tool for incentivizing renewables, and today more than half of the states have followed suit. So too for property tax incentives: In 1975, Indiana and again Massachusetts experimented with property tax policies encouraging renewable energy development, and now more than two-thirds of the states are benefitting from that innovation. State supported renewable energy project financing, which Oregon innovated in 1980, is now policy in thirty-seven states.

In each of these cases, a few "courageous" states carried the costs and risks of developing novel approaches to encouraging utilization of domestic renewable energy sources while the majority of states sat on the sidelines for decades as these experiments played out. When the effectiveness of the policy innovations became apparent, the free-riding states took advantage of the rewards that flowed from the willingness of a few states to undertake risky experiments. Some state experiments in policy directly incentivizing renewable energy development, such as income tax benefits and subsidized financing, have even led to the adoption of comparable federal policies, though federal support for these policies may be waning.

But in other cases policy innovation has not developed entirely from the bottom up. Direct grants to pay the costs of

renewable energy projects are a relatively novel policy tool, originating in the early 2000s in the limited number of states offering them. In contrast to income tax benefits and financing support, which were deployed first in a few states and then spread to many more states and eventually the federal government, grants originated as a federal policy innovation that in turn trickled down to the states. This top-down innovation avoids the free-rider problem because the costs of national policy are distributed among the states. At the same time, uniform national policy discourages dispersed experimentation and the concomitant benefits that are expected to flow from the federal structure.

Like direct encouragement, indirect incentives, particularly RPSs and net metering, have tracked the path from individual state experimentation to broad national deployment. But unlike the direct incentives of tax benefits and subsidized financing, neither RPSs nor net metering has been employed as a federal policy tool to encourage renewable energy development. The failure of either indirect incentive to be adopted at the federal level is noteworthy for three reasons. First, both policy tools trace their origins to the same time periods as the direct incentives that have been adopted at the federal level. Thus, the failure to adopt either policy at the federal level cannot be attributed to novelty. Second, both RPSs and net metering are more widely deployed among the states than any of the direct incentives that have been adopted at the federal level. The lack of federal counterparts, thus, cannot be the result of insufficient state-level support for the policies. Finally, and most significantly, both RPSs and net metering have been arguably the most effective policy tools for encouraging development of renewable energy sources.

Federal adoption of an RPS may only be a matter of time. Bills amending PURPA to require utilities to produce 25 percent of their electricity from renewables by 2025 have been introduced in both houses of Congress. Representative Markey introduced the American Renewable Energy Act in February of 2009, but the bill never made it out of committee. The same year, Senator Tom Udall brought forth companion legislation in the Senate, which suffered a similar fate. Notably, Udall's efforts to legislate a federal RPS date to 2002, when he introduced legislation as a member of the House. As a result of his efforts, federal RPS legislation passed the House in 2007, but the bill failed to make it through conference. While these efforts suggest that federal adoption of RPS as a policy incentive for renewable energy development may be on the horizon, they also suggest one possible explanation for the disparity between the federal adoption of direct incentives proven to work at the state level but not indirect incentives. Direct incentives, such as income tax deductions and subsidized loans, use benefits to encourage rather than command behavior. Indirect incentives, in contrast, mandate desired behavior. Thus, the adoption of direct incentives at the federal level increases the amount of benefits available to those engaging in the desired behavior. In contrast, when the federal government deploys indirect incentives, such as RPS, the result is not an increase in available benefits, but rather the possibility of conflicting commands. For example, the Udall and Markey legislation could either raise or lower the bar in every state with a renewable energy deployment goal different from that proposed at the federal level.

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Regardless of whether RPS is adopted at the federal level, the United States is closing the first chapter in renewable energy policy experimentation. The policy experiments a few brave states undertook more than thirty years ago have yielded benefits for the nation as whole. As the United States opens the second chapter of federalism and renewable energy policy, California has taken the lead as a laboratory for experimentation. How long it will take for the lessons from California's cap-and-trade policy experiment to be known and whether California's experimentation will lead to more widespread deployment of similar federal initiatives remains to be seen.