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Follow the Money!
Article I and Article VI Constitutional Barriers to Renewable Energy in the U.S. Future

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ABSTRACT

When one "follows the money," the current Administration's economic stimulus funding injected unprecedented billions of dollars into new energy-related capital investments. In doing so, it endeavors to fundamentally re-sculpt the legal fabric and infrastructure of the U.S. economy in a once-in-a-generation change of watershed proportion. However, this re-sculpting is hitting fundamental constitutional barriers under Articles I and VI.

There is a jurisdictional barrier: Renewable energy investments, promoted primarily at the state level, confront real challenges pursuant to the Constitution's Supremacy Clause (Article VI) and Commerce Clause (Article I). Among the most litigated constitutional issues before the U.S. Supreme Court, these constitutional articles establish hard legal limits on what states can and cannot do by regulation. In addition, as states collaborate on renewable energy policy, the Compact Clause raises distinct constitutional limits.

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Some states have ignored these constitutional limits in their regulatory requirements to promote the new renewable infrastructure. This article "follows the money" through the maze to identify the constitutional trip-wires. The article examines the array of the most employed regulatory methods by the fifty states—tax incentives, Renewable Portfolio Standards, feed-in tariffs, net metering, and direct renewable subsidies—to analyze which will and will not survive legal challenge and why.

Getting the legal metric correct at the state level is no small issue. No state statute or regulation on renewable energy can survive constitutional violation. In the past year, constitutional challenges to renewable infrastructure have occurred in five of the most sophisticated states—California, Massachusetts, New Jersey, Missouri, and New York. None of these states have prevailed in the first wave of these mounting legal confrontations over renewable energy programs.

This article takes apart the various infrastructure pieces and policies for renewable power in the states and examines the multi-faceted looming constitutional challenges. Popular renewable policy mechanisms for implementation of a new energy infrastructure confront constitutional perils that must be overcome. This outcome amid challenge will sculpt the energy future of the twenty-first century.

TABLE OF CONTENTS

I. FOLLOW THE MONEY

Follow the money!

~ Deep Throat to Bob Woodward[1]

A. Resculpting the Energy Foundation

"Follow the money." Changing the energy infrastructure and moving to a more sustainable energy infrastructure was the cornerstone of the Obama Administration's domestic policy agenda.[2] Significant amounts of controversial "stimulus" funds were devoted to this agenda, as well as large preferences in the tax code.[3] Despite these efforts, there are now significant legal barriers confronting sustainable energy initiatives. Recent state regulatory challenges in California, Massachusetts, New York, New Jersey, and Missouri appear to be just the opening shots. These states' renewable energy programs have failed against constitutional challenges under the Supremacy Clause of Article VI and the "dormant" Commerce Clause of Article I of the U.S. Constitution. The limits in implementing new renewable technologies are *not* technological; they are legal and regulatory. The foundation of renewable energy policy in the United States is constructed around corners of the new infrastructure:

- More than forty states enacted net metering[4]
- Approximately thirty states have RPS programs[5]
- Twenty-three states are regulating climate change emissions from traditional energy[6]
- Over twenty states have enacted renewable energy trust funds[7]
- Several states are adopting feed-in tariffs for renewable energy[8]

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[1] ALL THE PRESIDENT'S MEN (Warner Bros. 1976).

[2] American Recovery and Reinvestment Act of 2009 § 1302, I.R.C. § 48 (Supp. III 2010)).

[3] *See infra* Part II.D.3.

[4] N.C. State Univ., *Net Metering*, DATABASE OF STATE INCENTIVES FOR RENEWABLES & EFFICIENCY (DSIRE), http://www.dsireusa.org/solar/solarpolicyguide/?id=17 (last visited July 22, 2012).

[5] U.S. Energy Info. Admin., *Most States Have Renewable Portfolio Standards*, TODAY IN ENERGY (Feb. 3, 2012), http://www.eia.gov/todayinenergy/detail.cfm?id=4850.

[6] *See generally* INST. FOR ENERGY RESEARCH, ENERGY REGULATION IN THE STATES: A WAKE-UP CALL, *available at* http://www.instituteforenergyresearch.org/pdf/statereport.pdf.

[7] *See* LEWIS MILFORD ET AL., LEVERAGING STATE CLEAN ENERGY FUNDS FOR ECONOMIC DEVELOPMENT 2 (2012).

[8] *See generally* SCOTT HEMPLING, ET AL., NAT'L RENEWABLE ENERGY LAB., TECHNICAL REP. NO. NREL/TP-6A2-4740, RENEWABLE ENERGY PRICES IN STATE-LEVEL FEED-IN TARIFFS: FEDERAL LAW CONSTRAINTS AND POSSIBLE SOLUTIONS (2010), available at http://www.nrel.gov/docs/fy10osti/47408.pdf.

The importance of the electricity sector to the modern industrial economy is reflected in its changing role and societal impacts. In 1949, only eleven percent of global warming gases in the United States came from the electricity sector; today the percentage is more than one third.[9] Electricity is a unique commodity in the post-industrial economy for two reasons. First, electricity is more important now that it used to be. Coal empowered the industrial revolution. Oil powers modern transportation and current spatial land-use patterns. But electricity is the signature force in the modern information age.[10] Second, electricity, unlike other forms of energy, cannot be efficiently stored in bulk for more than a second before it is lost as heat.[11] The centralized power grid has to rebalance itself approximately every four seconds every minute of the year. Therefore, the supply of electricity must match the demand for electricity over the centralized utility grid of a nation on an instantaneous basis, or else the electric system shuts down or is damaged.[12]

The primary issues are now legal. On climate change and renewable energy, federal efforts have stalled.[13] Federal carbon legislation was abandoned by congressional leaders in 2009 and 2010.[14] The Kyoto Protocol, the world greenhouse gas (GHG) control agreement that the United States never ratified, now expires by its terms at the end of 2012.[15] A 2010 report for Ceres forecasts three key energy industry goals:

- Reducing GHG emissions by up to eighty percent
- Less emphasis on fossil fuel generation of electricity
- Greater implementation of smart grid and energy efficiency technologies[16]

Such trends foresee both significant environmental changes regarding global warming mitigation and a fundamental shift in how the economy produces and utilizes electricity in a post-industrial economy. As specific means to these practical changes, Ceres advocates:

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[9] *See Total Energy-Related Carbon Dioxide Emissions by End-Use Sector, and the Electric Power Sector, by Fuel Type, 1949-2007*, U.S. ENERGY INFO. ADMIN., http://www.eia.doe.gov/oiaf/1605/ggrpt/excel/historical_co2.xls (last visited July 7, 2012).

[10] STEVEN FERREY, ENVIRONMENTAL LAW: EXAMPLES & EXPLANATIONS 537, 539–40 (5th ed. 2010).

[11] *Id.* at 542.

[12] STEVEN FERREY, UNLOCKING THE GLOBAL WARMING TOOLBOX: KEY CHOICES FOR CARBON RESTRICTION AND SEQUESTRATION (Tony Quinn ed., 2010).

[13] Bobby McMahon, *Advocates May Shift Strategy to Tout Cutting Waste*, CLEAN ENERGY REP., Dec. 10, 2010; *Election Shifts MidWest Focus to Clean Energy: Away from Cap and Trade*, CARBON CONTROL NEWS, Dec. 13, 2010.

[14] *Id.*

[15] *See Kyoto Protocol*, United Nations Framework Convention on Climate Change, http://unfccc.int/kyoto_protocol/items/2830.php (last visited May 6, 2012).

[16] Forrest Small & Lisa Frantzis, THE 21ST CENTURY ELECTRIC UTILITY: POSITIONING FOR A LOW-CARBON FUTURE 8 (2010), *available at* http://www.ceres.org/resources/reports/the-21st-century-electric-utility-positioning-for-a-low-carbon-future-1.

- Renewable Portfolio Standards as important policy implementation tools
- Net metering as a way for augmenting renewable incentives[17]

However, within the constitutional model of U.S. law, the federalist fabric creates significant legal seams and wrinkles between state and federal authority over energy policy. This article looks at each of these key aspects of the new energy frontier. Current efforts are trying to turn the energy economy on its heel and navigate to a more sustainable future. In this pivot are significant constitutional challenges and barriers.

B. World Financial Requirements

What is required internationally to pivot the international energy base? It has been estimated that a ten trillion dollar expenditure in renewable resources will be required over the next two decades just to limit the rise in global temperature. [18] This is not billions, but trillions—enough to address the U.S. financial deficit. This amounts to 0.5% of global GDP in 2020 and 1.1% in 2030.[19] According to a 2007 report from the United Nations Environment Programme, investment capital flowing into renewable energy climbed from eighty billion dollars in 2005 to one hundred billion dollars in 2006.[20] This is still an order of magnitude lower than estimated requirements.

Despite the emergence of and attention to renewable energy sources, forecasters do not yet see the international mix of power generation sources changing appreciably over the next several decades.[21] The percentage of fossil fuels in the mix—and thus the potential sources of GHGs in the electric power sector—is expected to remain relatively constant. The International Energy Agency predicts that by 2030, power generation will account for fifty-nine percent of the increase in world gas demand, and fossil fuel sources will still supply eighty-two percent of the total, with non-hydro renewable energy sources supplying only six percent.[22] In response to this growing awareness and due to the lack of U.S. federal regulations relating to climate change and

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[17] *Id.* at viii.

[18] *IEA's $10 Trillion Climate Price Tag*, ELECTRICITY J., Dec. 2009, at 1, 2. It might achieve about as much in saved energy acquisition costs—$8.6 trillion by 2030.

[19] *Id* at 2.

[20] Press Release, Environmental Programme, Investors Flock to Renewable Energy and Efficiency Technologies (Jun. 20, 2007), *available at* http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=512&ArticleID=5616&l=en.

[21] Clark Gellings, Vice President, Electric Power Research Institute, Presentation at Aegis Conference (July 25, 2007).

[22] INT'L ENERGY AGENCY (IEA), WORLD ENERGY OUTLOOK 58, 70 (2004), *available* at http://www.iea.org/weo/docs/weo2004/WEO2004.pdf. This assumes an absence of new regulatory renewable energy incentives.

renewable energy, U.S. states are developing their own aggressive incentives for renewable energy production.[23]

C. Renewable Options

One of the primary tools to combat increases in greenhouse gas emissions from electricity production is to increase the use of renewable energy sources, many of which have zero net CO_2 emissions to replace the use of fossil fuel sources for electricity. Currently, the electric system relies primarily on coal-fired resources. Four hundred six U.S. coal-fired power plants produce about ninety-five percent of the coal-fired power in the U.S., which itself is about half of total U.S. electricity production, at an average cost of 3.2 cents/kWh; about ten percent of these older plants produce about forty-three percent of CO_2 emissions.[24] The Obama stimulus program[25] allocated $3.4 billion for fossil energy research and development; the Department of Energy spent an additional $687 million on clean coal. Yet this amount is less than ten percent of the amount expended by industry on traditional coal plants, none of which capture or store their carbon. Since 2008, sixteen new conventional coal plants have entered operation, with an equivalent number under construction in 2010.[26]

Renewable energy is a cornerstone of the new energy policy. Solar energy is the source of all energy on earth, creating wind and water movement and ultimately creating plants,[27] biomass, and animals that become fossil fuels when their organic matter decays. While the energy output of the sun in the direction of the Earth is about 1300 W/m^2 at its source, one third is reflected back into space by the Earth's atmosphere, yielding as much as 1000 W/m^2 at the surface of the Earth at noon on a cloudless day; an average of about 170 W/m^2 of solar radiation reaches the Earth's oceans over the hours of a year, and about 180 W/m^2 reaches land surfaces.[28]

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[23] *See* Steven Ferrey, *Power Future*, 15 DUKE ENVTL. L. & POL'Y F. 261, 284–87 (2005).

[24] *What Cost Energy? What Market Prices Fail to Reveal*, ELECTRICITY J., Dec. 2009, at 3, 3–4.

[25] American Recovery and Reinvestment Act of 2009 § 1302, I.R.C. § 48(c) (Supp. III 2010).

[26] Matthew Brown, *AP Enterprise: Coal Industry in Midst of Expansion, Despite Push for Clean Technologies*, ASSOCIATED PRESS, Aug. 17, 2010, *available at* http://www.startribune.com/templates/Print_This_Story?sid=100893384.

[27] VACLAV SMIL, ENERGIES: AN ILLUSTRATED GUIDE TO THE BIOSPHERE AND CIVILIZATION 46, 48 (1999). Plants are a significant source of energy. Photosynthesis is an endothermic reaction requiring 2.8 MJ of solar radiation to synthesize one molecule of glucose from six molecules of CO_2 and H_2O. Most of the terrestrial phytomass productivity in storage is in large trees in forests; phytoplankton species in the oceans store this mass in the hydrologic cycle. *Id.* Phytoplankton productions are sixty-five to eighty percent of the terrestrial phytomass total, but phytoplankton has a life span of only one-to-five days. *Id.* The most voluminous trees are the most massive life forms on earth, with the most phytomass, and are even larger than blue whales in mass. *Id.* at 51. Tropical forests use available nutrients rather inefficiently. *Id.*

[28] *Id.* at 5. This results in total solar radiation annually of 2.7 x 10^{24} joules. This amount of energy reaching the earth in the form of solar radiation is about 8,000 times more than worldwide consumption of fossil fuels and electricity. *Id.* at 6.

Human capture of this energy is neither efficient nor prodigious. Energy used by humankind on the earth equals only about 0.01% of the total solar energy reaching the Earth.[29] Wind's global energy potential is thirty-five times world electricity use.[30] Wind is less expensive than concentrating solar collectors or biomass for electricity production. Wind is a substantial component of new electric capacity. In 2008, it was estimated that forty-two percent of all new electric power capacity additions in the United States were wind-powered.[31] Solar energy provides as much potential energy as humankind uses each year roughly every seventy minutes.[32] In fact, no nation on Earth uses more energy than the energy content contained in the sunlight that strikes its existing buildings every day.[33] The solar energy that falls on roads in the United States each year contains roughly as much energy content as all the fossil fuel consumed in the world during that same year.[34]

Even some leaders of the oil industry suggest that solar, wind, and other renewable resources could meet fifty percent of total energy demand in the world by 2050.[35] In addition to environmental and climate benefits, a renewable-energy economy would have national security benefits by reducing importation of fuels, as well as by reducing the vulnerability of the electricity grid to terrorist attack.[36] However, solar photovoltaic technologies require a large amount of land compared to conventional means of power production.[37] Concentrating solar collectors require ten times as much land area, and wind turbines require up to seventy times as much land area, as does a typical fossil-fuel-fired power plant.[38] This is because solar technology is less efficient in generating electricity[39] through a centralized turbine technology than concentrated fossil-fuel technologies.[40] Concentrated solar-power technology plants consume significant amounts of water because their electric production is less efficient than the use of fossil fuels, and four states have denied permits for such solar facilities because of their water

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[29] STEVEN FERREY & ANIL CABRAAL, RENEWABLE POWER IN DEVELOPING COUNTRIES: WINNING THE WAR ON GLOBAL WARMING 36 (2006).

[30] Amory B. Lovins, Imran Sheikh & Alex Markevich, *Forget Nuclear*, SOLUTIONS, Spring 2008, at 1, 25, *available at* http://www.rmi.org/Content/Files/SolutionsJournalSpring2008.pdf.

[31] AM. WIND ENERGY ASS'N, ANNUAL WIND INDUSTRY REPORT YEAR ENDING 2008 1, 2, (2009), *available at* http://www.awea.org/_cs_upload/learnabout/publications/5094_1.pdf.

[32] *Id.*

[33] FERREY & CABRAAL, *supra* note 29, at 36.

[34] *Id.*

[35] *See* JEREMY RIFKIN, THE HYDROGEN ECONOMY: THE CREATION OF THE WORLDWIDE ENERGY WEB AND THE REDISTRIBUTION OF POWER ON EARTH 189 (2002).

[36] *See* ROSS GELBSPAN, BOILING POINT: HOW POLITICIANS, BIG OIL AND COAL, JOURNALISTS, AND ACTIVISTS ARE FUELING THE CLIMATE CRISIS—AND WHAT WE CAN DO TO AVERT DISASTER 176 (2002).

[37] Robert Glennon & Andrew Reeves, *Solar Energy's Cloudy Future*, 1 ARIZ. J. ENVTL. L. & POL'Y 91, 103–04 (2010).

[38] *Id.* at 108.

[39] *Id.* at 127 (citing U.S. ENERGY INFO. ADMIN., ELECTRIC POWER ANNUAL 2008, Table ES1 (2010)) (showing less than twenty percent efficiency of installed solar capacity).

[40] *Id.* at 101 & n.64.

demands.[41] National environmental organizations generally supporting renewable energy have become divided regarding their decisions involving renewable projects.[42]

What many renewable energy projects, other than those using biomass fuels, have in common is that they do not combust fuels to produce electricity. They either create mechanical shaft power from the movement of wind or water, tap naturally produced geologic steam, or employ solar energy to induce direct current on a chemical surface.[43] Because renewable energy alternatives—solar, wind, hydro, geothermal—do not involve combustion to produce electric energy, they do not emit various pollutants or GHGs during their operation.[44] What initially seemed like a no-brainer—what regulatory initiatives get there from here—has become a major impediment. Constitutional challenges are a barrier.

II. REGULATORY TECHNIQUES FOR RENEWABLE POWER IN THE U.S. CONSTELLATION

"Nothing's riding on this except the First Amendment of the Constitution, freedom of the press and maybe the future of this country."

~ Ben Bradlee to Woodward and Bernstein[45]

A. Renewable Portfolio Standards as a Permissible Legal Mechanism?

1. The Legal Policy Tool

One legal tool is state mandatory minimum renewable energy supply requirements, usually imposed on retailing electric utilities or independent retail suppliers. These alternatives typically are known as Renewable Portfolio Standards (RPS). As of January 2012, thirty states and the District of Columbia had some form of RPS program.[46] Roughly half of those twenty-nine states employ differentiated tiers of renewable energy credits or certificates (RECs), serving a variety of functions for those tiers:

- Some states distinguish tiers by the vintage for the creation of the REC[47]
- Some states designate tiers by type of technology of renewable resource so as to be able to promote a certain technology[48]

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[41] *Id.* at 95, 100–01.
[42] *Id.* at 116, nn.175–176 & 211–214.
[43] *See* 1 STEVEN FERREY, LAW OF INDEPENDENT POWER § 2:11 (2012), *available at* Westlaw INDPOWERL.
[44] *Id.* at 6-54 & tbl. 6.13.
[45] ALL THE PRESIDENT'S MEN, *supra* note 1.
[46] *See* TODAY IN ENERGY, *supra* note 5.
[47] Rhode Island and Delaware (partially) have such systems.
[48] Such states include Connecticut, Maryland, New Jersey, Washington, D.C., and Texas (partially).

- Some states create technology set-asides or bands of technology[49]
- Other states have only a single type of REC regardless of technology, evidenced by a single tier, with only new construction renewable energy projects eligible[50]; other states have a single tier which allows both new and existing projects to qualify[51]

This creates myriad variations on state RPS models. These mandatory RPS programs cover forty-six percent of nationwide retail electricity sales.[52] The RPS programs in the states are very different in terms of what technologies qualify. Most states allow solar, wind, biomass, and landfill gas resources to qualify in RPS programs; states are less consistent regarding eligibility for biogas, municipal solid waste (MSW), geothermal, hydro resources, fuel cells, and ocean tidal renewable resources to qualify.[53] Some states include cogeneration while Pennsylvania and Massachusetts include coal gasification.[54] Resource eligibility in state RPS programs has expanded beyond traditional renewables, with three states now allowing demand-side energy efficiency to meet at least a portion of their RPS requirement.[55] Some states set standards based on a percentage of installed capacity, while other states set standards based on a percentage of total electricity sales.

RPS programs function as a form of back-door renewable subsidies.[56] In about half of the RPS programs, solar energy installations are being encouraged in a variety of ways.[57] Several states also reward rebates to customers who install solar systems.[58] Solar-specific RPS designs in eleven states and Washington, D.C. include solar or distributed generation set-asides for a percentage of eligible projects.[59] These set-aside policies have already supported more than 100 MW of solar photovoltaic (PV) projects and 65 MW of solar-thermal electric capacity.[60] Roughly

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[49] Arizona, Colorado, Minnesota, Montana, Nevada, New Jersey, New York, Pennsylvania, and Washington, D.C. are examples of this.

[50] Iowa, Massachusetts, Montana (for out-of-state projects) and the Minnesota program covering XCEL are examples of this.

[51] California (partially), Colorado, Hawaii, Maine, Minnesota, Montana (for in-state projects), New Mexico, New York (partially), Nevada, Pennsylvania, Texas (partially), and Wisconsin are examples of this.

[52] RYAN WISER & GALEN BARBOSE, RENEWABLE PORTFOLIO STANDARDS IN THE UNITED STATES: A STATUS REPORT WITH DATA THROUGH 2007 1 (2008), *available at* http://eetd.lbl.gov/ea/EMS/reports/lbnl-154e-revised.pdf.

[53] *Id*. at 8.

[54] N.C. State Univ., *Pennsylvania: Incentives/Policies for Renewables & Efficiency*, DSIRE (Aug. 23, 2011), http://www.dsireusa.org/incentives/ incentive.cfm?Incentive_Code=PA06R&re=1&ee=1; *see also* Mass. Exec. Off. of Energy & Envtl. Aff., *RPS and Aps Program Summaries*, MASS.GOV, http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/rps-aps/rps-and-aps-program-summaries.html (last visited July 22, 2012).

[55] WISER & BARBOSE, *supra* note 52.

[56] Gleenon & Reeves, *supra* note 37, at 106.

[57] *Id.* at 106 n.21.

[58] *Id.* at 11 & tbl.3.

[59] *Id.* at 1.

[60] *Id.*

6,700 MW of solar capacity would be needed by 2025 to fully meet existing set-aside requirements.[61] Eligible projects technologies are set forth in Table 1. Some states allow renewable energy credits to be traded, while other states do not.

Table 1: "Renewable" Resources as Defined in Early-Adopter State Statutes

State	Solar	Wind	Fuel Cell	Methane/ Landfill	Biomass	Trash-to-Energy
Arizona	X	X			X	
California	X	X		X	X	X
Connecticut	X	X	X	X	X	X
Iowa	X	X	X		X	
Illinois	X	X			X	X
Maine	X	X	X		X	X
Maryland	X	X	X	X	X	
Massachusetts	X	X	X	X	X	X
Minnesota		X			X	
Nevada	X	X	X			
New Jersey	X	X	X	X	X	X
New Mexico	X	X	X	X	X	X
New York	X	X				X
Oregon	X	X		X		X
Pennsylvania	X	X		X	X	X
Rhode Island	X	X		X	X	X
Texas	X	X		X	X	X
Wisconsin	X	X	X		X	X

State	Hydro	Tidal	Geothermal	Photovoltaic	Dedicated Crops
Arizona		X		X	
California	X		X	X	
Connecticut	X			X	
Iowa				X	

[61] *Id.*

State	Hydro	Tidal	Geothermal	Photovoltaic	Dedicated Crops
Illinois	X			X	X
Maine	X	X	X	X	
Maryland		X	X	X	
Massachusetts	X	X		X	X
Minnesota					
Nevada			X	X	
New Jersey	X	X	X	X	
New Mexico	X	X	X	X	
New York	X	X	X	X	
Oregon	X	X	X	X	X
Pennsylvania	X		X	X	X
Rhode Island	X			X	
Texas	X	X	X	X	
Wisconsin	X	X	X		X

Note: Photovoltaic is included within solar in some states; methane and or trash-to-energy may be included within a broad definition of "biomass".

RPS programs have had an impact as a policy tool. Over fifty percent of the non-hydro renewable capacity additions in the United States for the decade from 1998 through 2007 occurred in states with RPS programs; ninety-three percent of these additions came from wind power, four percent from biomass, two percent from solar, and one percent from geothermal resources.[62] The required percentage of energy delivered from renewables ranges from two to forty percent of annual retail sales in different state programs, but these numbers can be deceiving depending upon whether preexisting renewable resources are counted.[63]

All policy incentives have failed to substantially increase the deployment of renewable energy technologies on a percentage basis at the national scale.[64] Non-hydroelectric renewable energy resources have continued to hover around two percent of the U.S. electricity supply.[65]

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[62] WISER & BARBOSE, *supra* note 52.

[63] *See* DSIRE, *supra* note 4.

[64] Ryan Wiser et al., *Evaluating Experience with Renewable Portfolio Standards in the United States,* 10 MITIGATION & ADAPTATION STRATEGIES FOR GLOBAL CHANGE 237, 243–44 (2005) (cited in Benjamin K. Sovacool & Christopher Cooper, *Big Is Beautiful: The Case for Federal Leadership on a National Renewable Portfolio Standard,* ELECTRICITY J., May 2007, at 48).

[65] U.S. ENERGY INFO. ADMIN., No. DOE/EIA-0383, ANNUAL ENERGY OUTLOOK 2007: WITH PROJECTIONS TO 2030 86 (2006). By the year 2030, the share of biomass resources is expected to double from 0.9% to 1.7% of total generation; wind is forecast to triple its percentage from the current 0.4% to approximately 1.1%, while geothermal

Therefore, while various renewable technologies are projected to double or triple their gross amount of power contribution, this is not projected to have a significant impact because renewable technologies are starting from a very small base so even a large percentage increase translates to a relatively small absolute increase.

Assuming that full compliance is achieved, current state RPS policies will require the addition of roughly sixty GW of new renewable energy capacity by 2025.[66] This amount is equivalent to 4.7% of projected 2025 electricity generation in the United States, and fifteen percent of projected electricity demand growth.[67] It is likely impractical to have RPS projects around the country install the estimated sixty GW of new energy capacity.[68] Nexant consultants determined that a thirty-three percent RPS mandate by 2020 would cost $8.9 billion, while saving $6.3 billion (in 2008 constant dollars) as of 2020.[69]

Nor has the sailing been smooth in terms of reassessment. Several states in 2011 were considering possible curtailment or repeal of their RPS programs, including Colorado, Connecticut, Montana, Wisconsin, Arizona, New Mexico, and Maine.[70] New Hampshire, New Jersey, and New York diverted part or all of their Regional Greenhouse Gas Initiative (RGGI) funds.[71] Massachusetts diverted seventeen million dollars from its renewable energy trust to unauthorized non-energy purposes.[72] Vermont diluted the price of RECs by changing its regulations to allow large hydroelectric projects to qualify as eligible renewable technologies.[73] New Hampshire considered dropping out of Northeast carbon regulation.[74] Connecticut extended an expired cost charge on utility to raise additional general revenue.[75] Overall, various renewable energy programs have become cash diversion targets, and some states have considered withdrawing from RPS programs.

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power resources are projected to increase from 0.4% to 0.9% by 2030. Grid-connected solar photovoltaics are anticipated to remain at less than 0.1% of total electric generation in the United States by 2030. *Id.* at 85–86.

[66] WISER & BARBOSE, *supra* note 52.

[67] *Id.*

[68] Tom Tiernan, *EEI Says Some RPS Targets "Unachievable" as Industry Deals With Infrastructure Debate*, ELECTRIC UTIL. WK., May 5, 2008, at 7.

[69] *Time to Grapple with Collateral Issues of Renewable Standards*, ELECTRICITY J., Aug. 2009, at 3.

[70] E. Howland & Pam Russell, *RPS Repeal Is Eyed in Some States but Chances of Success Are Unclear*, ELECTRICITY UTIL. WK., Jan. 24, 2011 at 1, 39; Lisa Wood, *Green Advocates in Maine Fear RGGI Funds May Be Used to Close Budget Gap*, ELECTRIC UTIL. WK., Jan. 24, 2011, at 8–9.

[71] Wood, *supra* note 70, at 8–9; Lisa Wood & Rob Matyi, *New Leadership in Several States May Weaken "Green" Mandates, Citing Cost Considerations*, ELECTRIC UTIL. WK., Feb. 14 2011, at 34–35.

[72] *See Changes for Renewable Energy Trust*, NEWSL. (Solar Energy Bus. Ass'n of New Eng., Boston, Mass.), Mar. 2003, *available at* http://sebane.org/newsletter/march_2003_print.asp.

[73] Wood & Matyi, *supra* note 71, at 34.

[74] *Id.*

[75] Lisa Wood, *Connecticut Governor Proposes $58 Million Tax on Generation to Help Reduce Budget Deficit*, ELECTRIC UTIL. WK., Feb. 21, 2011, at 5.

2. Article I of the Constitution Limits Regarding State RPS

Under legal precedent, states control all aspects of an RPS renewable energy program associated with power generation.[76] In this regard, they do not act as market participants but as regulators and thus are subject to jurisdictional and constitutional limitations. "Place" matters in many venues: realtors speak of "location, location, location!" We live in a federalist legal and political system where states separately enact laws, and even separately vote for electors to the electoral college to choose a President.[77] Legally, in the U.S. system, state power is not absolute. This is especially true in the electric power sector. Recall that states regard the geographic location where RECs are created differently:

- Four of the twenty-nine RPS states expressly require that RECs be created by power generation in the state; some other states require that it either be in-state or in the service territory of a state utility; yet other states ban the export of RECs out of their states. These circumstances each raise constitutional dormant Commerce Clause issues.[78] States with in-state preferences include:
    - California[79]
    - Colorado[80]
    - North Carolina[81]
    - Ohio[82]
- Some states require an in-state transmission interconnection to count an out-of-state REC.[83]
- Several states require that a REC actually be associated with energy that is, or could be, by virtue of transmission capability that is contracted or delivered in-state.[84]
- Some states allow a wider trading area within an ISO or similar region.[85]

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[76] Am. Ref-Fuel Co., 105 F.E.R.C. ¶ 61004, 61007 (2003); Xcel Energy Servs., Inc. v. FERC, 407 F.3d 1242, 1243–44 (D.C. Cir. 2005).

[77] *See* Jeff Jacoby, *The Brilliance of the Electoral College*, BOSTON GLOBE, July 16, 2008, http://www.boston.com/bostonglobe/editorial_opinion/oped/articles/2008/07/16/the_brilliance_of_the_electoral_college/.

[78] Iowa, the XCEL requirement in Minnesota, and Hawaii are examples of this.

[79] *California Renewables Portfolio Standard*, DSIRE, *supra* note 4 (Apr. 26, 2012), http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=CA25R&re=1&ee=1.

[80] COLO. REV. STAT. ANN. § 40-2-124 (2009).

[81] N.C. GEN. STAT. § 62-133.8 (2007).

[82] OHIO REV. CODE ANN. § 4928.64 (1998)

[83] Nevada and Texas are examples of this.

[84] Arizona, California, Wisconsin, Minnesota, New Mexico, and New York are examples of this. Delivery can be required on a real-time, monthly, or yearly basis.

- Eight of the twenty-nine RPS states encourage, but do not require, RECs to be traded in-state by attaching a multiplier value to these in-state RECs.[86]
    - Arizona[87]
    - Colorado[88]
    - Delaware[89]
    - Maine[90]
    - Michigan[91]
    - Missouri[92]
    - Nevada[93]
    - Washington[94]
- Distributed generation typically must be located in the state to qualify to create RECs.[95]
- Four of the twenty-nine RPS states give program preferences to the use of in-state manufactured products or in-state labor forces:
    - Arizona[96]
    - Delaware[97]
    - Michigan[98]
    - Montana[99]

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[85] California, the New England states, Delaware, New Jersey, and Pennsylvania are examples of this, as are multi-jurisdictional utilities. In this case, unbundled RECs can trade apart from the actual energy trade.

[86] Colorado, Delaware and Arizona have attached in-state multipliers to RECs created in the state.

[87] ARIZ. ADMIN. CODE § R14-2-1801 (2007)

[88] COLO. REV. STAT. ANN. § 40-2-124 (2009).

[89] DEL. CODE ANN. tit. 26, § 351 (2005).

[90] ME. REV. STAT. tit. 35-A, § 3210-C (2011).

[91] MICH. COMP. LAWS § 460.1001 (2008).

[92] MO. REV. STAT. § 393.1020 (2011).

[93] NEV. REV. STAT. § 704.7801 (2009).

[94] WASH. ADMIN. CODE § 194-37 (2008).

[95] Requirements to create RECs in a state raise dormant Commerce Clause issues and multipliers can raise similar concerns.

[96] ARIZ. ADMIN. CODE § R14-2-1801 (2007).

[97] DEL. CODE ANN. tit. 26, § 351 (2012).

[98] MICH. COMP. LAWS § 460.1001 (2008).

[99] MONT. CODE ANN. § 69-3-2005(3)(a) (2009).

These state requirements change over time. For example, going back four years in program evolution:

- Colorado, Illinois, and North Carolina gave preferences to in-state projects.[100]
- Hawaii and Iowa required RPS generation to be from in-state sources or from the service territory of an in-state utility.[101]
- California's 2006 amendments to its RPS law for the first time in a decade allowed any promulgated regulations to recognize new out-of-state generation to be counted toward RPS requirements of load serving entities in the state, thereby to some degree removing constitutional issues.[102]
- Eight states required that the power eligible for RPS RECs must be delivered to in-state load-serving entities.[103]

Geographic program restrictions raise dormant Commerce Clause concerns under Article I of the U.S. Constitution.[104] Providing limitations for in-state use of electricity, fuel, or renewable portfolio standards has not been found constitutional by the courts. Use of indigenous fuel supplies for electricity was stricken in *Wyoming v. Oklahoma*.[105] Income tax credits cannot be given by a state only to in-state producers of fuel additives.[106] In-state coal cannot be required by a state in order to satisfy federal Clean Air Act requirements.[107]

Article I, section 8 of the Constitution states that "Congress may regulate Commerce . . . among the several States . . . ." The dormant Commerce Clause prohibits actions that are facially discriminatory against interstate commerce.[108] The so-called dormant Commerce Clause restriction is "driven by concern about 'economic protectionism—that is, regulatory measures designed to benefit in-state economic interests by burdening out-of-state competitors."[109] Discriminatory statutes are subject to "strict scrutiny," and for such a statute or regulation to be valid, the state must establish that the statute serves a compelling state interest through the least restrictive means to achieve that interest.

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[100] WISER & BARBOSE, *supra* note 52.
[101] *Id.*
[102] Cal. S.B. 107, Ch. 464 (2006), *available at* http://www.leginfo.ca.gov/pub/05-06/bill/sen/sb_0101-0150/sb_107_bill_20060926_chaptered.html.
[103] WISER & BARBOSE, *supra* note 52, at 10.
[104] FERREY, *supra* note 10, at 150–55.
[105] 502 U.S. 437 (1992).
[106] New Energy Co. of Ind. v. Limbach, 486 U.S. 269, 271, 278–80 (1988).
[107] Alliance for Clean Coal v. Miller, 44 F.3d 591, 596–97 (7th Cir. 1995).
[108] *See* Dep't of Revenue v. Davis, 553 U.S. 328, 338 (2008) (quoting Or. Waste Sys., Inc. v. Dep't of Envtl. Quality, 511 U.S. 93, 100 (1994)).
[109] *See Davis*, at 328 (quoting *Limbach*, 486 U.S. at 273–74).

If the statute is found to discriminate against out-of-state interests based on geographic limitations or favoring local interests to the detriment of interstate commerce, a court will find the statute *per se* invalid.[110] The courts have determined that electrons in interstate commerce cannot be traced.[111] In *West Lynn Creamery v. Healy*, the Supreme Court found that "even if environmental preservation were the central purpose" of the regulation, it "would not be sufficient to uphold a discriminatory regulation."[112]

Constitutional concerns are not wholly avoided even when states combine collectively to address renewable power issues. An interstate compact may make sense for energy planning on a regional basis, but such a compact creates legal issues. The Interstate Compact Clause of the Constitution provides:

> No State shall, without the Consent of Congress, lay any Duty of Tonnage, keep Troops, or Ships of War in time of Peace, enter into any Agreement or Compact with another State, or with a foreign Power, or engage in War, unless actually invaded, or in such imminent Danger as will not admit of delay.[113]

Multi-state compacts require federal congressional approval to be constitutional. Multi-state agreements fall into this category. To the contrary, actions by regional Independent System Operators (ISOs), which can transcend state borders because they operate pursuant to federal approval of the Federal Energy Regulation Commission (FERC), would not invoke the Compact Clause. Action by an ISO does not confront the legal impediments that a multi-state compact would since it is established by federal order and tariff. As an entity approved by federal law and order, ISOs are not subject to Compact Clause, Supremacy Clause, or Commerce Clause restrictions.

A multi-state compact, once approved by Congress, elevates state action to federal law. As federal law, the compact preempts other state law, even if it discriminates against out-of-state entities.[114] The compact would preempt all other conflicting state laws and even state constitutions.[115] If there were an interstate compact, it would avoid Supremacy Clause preemption challenges because it constitutes federal law that would preempt all other state law or orders. Since the federal government can discriminate against particular states through federal

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[110] *See* Philadelphia v. New Jersey, 437 U.S. 617, 624 (1978) (noting that if a statute is facially discriminatory, it is virtually *per se* invalid).

[111] New York v. FERC, 535 U.S. 1, 7 n.5 (2002) (discussing Fed. Power Comm'n v. Fla. Power & Light Co., 404 U.S. 453 (1972)).

[112] W. Lynn Creamery, 512 U.S. 186, 206 (1994) (citing *Philadelphia*, 437 U.S. 617).

[113] U.S. CONST. art. I, § 10, cl. 3.

[114] Cuyler v. Adams, 449 U.S. 433, 439–40 (1981).

[115] Stephans v. Tahoe Reg'l Planning Agency, 697 F. Supp. 1149, 1152 (D. Nev. 1988).

legislation, an interstate compact becomes federal law, and the action is immunized against dormant Commerce Clause violations, which are a matter of state action.[116]

Multi-state agreements are not entitled to constitutional Eleventh Amendment immunity because they are not the act of a single sovereign state. The multiple states involved are thus subject to suit in federal court regarding any disputes.[117] Sovereign immunity is lost once more than one sovereign state is involved.[118] The "Appointments Clause" of the Constitution requires that regional energy entity members be appointed by the President.[119] Recently, the Supreme Court interpreted a historic compact between New Jersey and Delaware, regarding the veto power of one over the energy facility siting decisions of the other.[120]

3. Constitutional Article I Litigation on RPS

A half-dozen of the twenty-nine RPS states already have faced constitutional challenge, with few victories. Courts require that state actions that facially discriminate against interstate commerce must not be able to be served by nondiscriminatory alternatives.[121] Geographically discriminatory state statutes are almost always stricken. A number of states prohibit the REC credit for out-of-state or out-of-region generation facilities.[122] Essentially all RECs are a function of the generation of power, as defined by each state. Some states give preferences for RECs associated with the generation of in-state power resources, restrict trading in out-of-state RECs, and harbor RECs created in the state to remain in the state or be restricted in their use outside of the state.[123] This becomes critical given that states could not impose such limitation on the underlying commerce associated with energy itself, which typically also either proceeds through a federally jurisdictional wholesale transaction.[124]

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[116] Prudential Ins. Co. v. Benjamin, 328 U.S. 408, 434 (1946); *see also* Hillside Dairy, Inc. v. Lyons, 539 U.S. 59, 66 (2003) (noting that Congress can also authorize states to discriminate against interstate commerce if it does so clearly enough); New York v. United States, 505 U.S. 144, 171 (1992) (same); N.Y. State Dairy Foods, Inc. v. Ne. Dairy Compact Comm'n, 198 F.3d 1, 18 (1st Cir. 1999); Cent. Midwest Interstate Low-Level Radioactive Waste Comm'n v. Pena, 113 F.3d 1468, 1470 (7th Cir. 1997).

[117] Hess v. Port Auth. Trans-Hudson Corp., 513 U.S. 30, 39–42 (1994); Lake Country Estates, Inc. v. Tahoe Reg'l Planning Agency, 440 U.S. 391, 400 (1979).

[118] *Id.*

[119] U.S. CONST. art. II, § 2, cl. 2.

[120] New Jersey v. Delaware, 552 U.S. 597, 622 (2008).

[121] Dep't of Revenue v. Davis, 553 U.S. 328, 338–39 (2008) (quoting Or. Waste Sys., Inc. v. Dep't of Envtl. Quality, 511 U.S. 93, 100-01 (1994)).

[122] WISER & BARBOSE, *supra* note 52, at 9 & tbl.2.

[123] *See infra* Section II.B.

[124] The amount of power traded at wholesale has increased significantly in recent years, especially with the deregulation of retail power in several states. *See* FERREY, *supra* note 10, at 561.

A state cannot regulate to favor or require use of its own in-state energy resources,[125] nor can it try to harbor energy-related resources originating in the state from leaving the state.[126] In 2010, Massachusetts was sued regarding the constitutionality of its renewable energy program and settled the litigation by giving the plaintiffs everything they sought rather than have a judge address the program's legality. Massachusetts allowed only in-state solar PV RECs to be earned and traded. The Commonwealth of Massachusetts enacted a statewide renewable energy power auction to procure renewable power on behalf of willing in-state utilities that are required by state law to have at least three percent of their annual demand met through ten-year or fifteen-year wholesale power purchase agreements with renewable power developers.[127]

This program was challenged in 2010 by TransCanada Corporation, the owner of a Maine wind project.[128] The complaint alleged that Massachusetts's limitation on both solar RECs and long-term contracts to Massachusetts companies discriminated against out-of-state renewable energy projects in violation of the dormant Commerce Clause.[129] After stating that it had confidence in its position, Massachusetts immediately settled the litigation, allowing TransCanada to be eligible for these programs.[130] Massachusetts surrendered in this case but avoided a court declaration on the constitutional war.

California traditionally allowed only non-tradable RECs, linked to the sale of electricity, to be used to satisfy the California RPS; this prohibited out-of-state renewable generation facilities from selling their RECs in California.[131] In 2006, the state legislature authorized, but did not require, the use of tradable RECs apart from power in California.[132] In 2010, the limit was changed by regulators to allow twenty-five percent of the California RPS to be satisfied by tradable RECs not bundled with electric power.[133] While this would seem like a more open-minded removal of state barriers, it actually operates in the opposite fashion. Where before, it could be argued that the regulatory distinction was not based on geographic limitations but on a non-separate tradable status, as long as California does not create tradable RECs, the newer 2010

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[125] Wyoming v. Oklahoma, 502 U.S. 437, 454–56 (1992); Alliance for Clean Coal v. Craig, 840 F. Supp. 554, 560 (N.D. Ill. 1993).

[126] New England Power Co. v. New Hampshire, 455 U.S. 331, 339 (1982).

[127] 225 MASS. CODE REGS. 14 (2011).

[128] Complaint at 1, TransCanada Power Mktg., Ltd. v. Bowles, No. 4:10-cv-40070-FDS (D. Mass. Apr. 16, 2010).

[129] *Id.*

[130] *See* Partial Settlement Agreement Between TransCanada and Massachusetts Officials, *available at* http://www.mass.gov/eea/docs/doer/renewables/solar/settlement-agreement.pdf.

[131] CAL. PUB. UTIL. CODE §399.16 (West 2011).

[132] Cal. S.B. No. 107, ch. 464 (2006), *available at* http://www.leginfo.ca.gov/pub/05-06/bill/sen/sb_0101-0150/sb_107_bill_20060926_chaptered.html.

[133] Decision Authorizing Use of Renewable Energy Credits for Compliance with the Cal. Renewables Portfolio Standard, CPUC No. 10-03-021, (Mar. 16, 2010), *available at* http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/115056.pdf.

system has the effect of limiting out-of-state renewable generation RECs to a minority share of the compliance credits. California, after losing a suit on its carbon control mechanism for failing to evaluate alternatives to cap-and-trade regulation, chose in mid-2011 to delay its GHG Cap-and-Trade program for an additional year until 2013 from its scheduled 2012 implementation.[134]

In 2009, Indeck Energy, the owner of a New York cogeneration power facility, sued the state of New York regarding the constitutionality of its carbon regulation program, part of the ten-state Regional Greenhouse Gas Initiative (RGGI), which imposes additional costs to purchase carbon emission allowances on wholesale power sellers.[135] New York quickly settled the suit, granting plaintiffs complete relief and not imposing any of these approximately three million dollars in annual costs on the specific wholesale market plaintiffs, rather than letting the court address the legality of its state program. New York's participation in RGGI was challenged a second time in 2011 as being without proper legislative approval.[136]

There also is litigation in New Jersey, Colorado, and Missouri contesting dormant Commerce Clause violations. American Tradition Institute's (ATI) Environmental Law Center filed a lawsuit in federal court challenging the constitutionality of Colorado's renewable energy standard, based upon evidence that the state's law violates the Commerce Clause.[137] ATI's complaint argued that because the state mandate provides economic benefits to Colorado's renewable electricity generators that are not available to out-of-state power generators, the program violates the dormant Commerce Clause.[138] ATI also argued that because the state imposes burdens on interstate electricity generators that are not balanced by the benefits to Colorado and its citizens, the RPS violates the Commerce Clause.[139]

In 2011, New Jersey enacted legislation to encourage the acquisition by utilities of the output of 2000 Mw of new in-state power projects.[140] New Jersey faces a pending lawsuit by several existing independent power generators asserting that the state law is in violation of the

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[134] Lisa Weinzimer & Geoffrey Craig, *Delaying California GHG Cap-and-Trade Regime a Year Draws Support from Stakeholders*, ELECTRIC UTIL. WK., July 4, 2011, at 11–12.

[135] *Indeck Energy Sues State Questioning Legality of Regional Greenhouse Gas Program*, INDECK ENERGY SERV., INC. (Jan. 29, 2009), http://www.indeckenergy.com/pdfnews/RGGI%20Lawsuit%20012909%20.pdf.

[136] Complaint, Thrun v. Cuomo (N.Y. Sup. Ct. June 27, 2011), *available at* http://static.taxcutsforall.com/files/RGGI%20complaint.pdf; Geoffrey Craig & Gail Roberts, *Lawsuit Disputes Legality of New York Participation in RGGI, Citing State's Lack of Legislative Approval*, ELECTRIC UTIL. WK., July 4, 2011, at 10.

[137] Complaint, Am. Tradition Inst. v. Colorado, Civil Action No. 1:11-cv-00859-WJMKLM (D. Colo. filed April 2011), *available at* http://www.americantradition.org/wp-content/uploads/2011/04/ATI-RPS-Complaint-ATI-v-Colorado.pdf.

[138] *Id.* at 5–6.

[139] *Id.* at 2–7.

[140] Act of Jan. 28, 2011, P.L.2011, ch. 9 (establishing a long-term capacity agreement pilot program to promote construction of qualified in-State electric generation facilities), *available at* http://legiscan.com/gaits/text/359280.

Commerce Clause, because it is predicated on in-state "favoritism," and that the New Jersey act is a blatant and explicit effort to promote the construction of new generation facilities in New Jersey.[141] There also was a complaint at FERC[142] alleging discrimination in New Jersey's statute ordering utilities to sign long-term contracts only with in-state generation facilities participating in multi-state PJM independent system operator (ISO) capacity.[143] In response, FERC amended the PJM ISO rules to prevent New Jersey state law from attempting to encourage construction of in-state power generation by, in part, causing them to bid power into the PJM system at suppressed prices in order to win capacity right auctions.[144]

A state court in 2011 ruled that the Missouri RPS program was illegal because it required RECs to be generated by in-state projects or projects that delivered the power to in-state customers.[145] The opinion held that the RPS program "takes the cash property of utilities (and their ratepayers) and transfers it to certain customers" without due process.[146] The decision is now being appealed.[147]

These types of challenges are spilling over international borders. In mid-2011, T. Boone Pickens's company, Mesa Power Group, filed a formal notice of intent to claim that the Canadian government had violated the North American Free Trade Agreement (NAFTA) regarding renewable power development by giving priority transmission rights to Samsung projects promoted by the South Korean company, requiring use of "local content" in the wind farm development, and making arbitrary changes in the Canadian feed-in tariff for wind power.[148]

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[141] PJM Interconnection, L.L.C., 135 FERC ¶ 61,022 (2011).

[142] *Id.*

[143] Mary Powers, *PJM Generators File Complaint with FERC Seeking Relief from NJ In-State Generation Law*, ELECTRIC UTIL. WK., Feb. 7,2011, at 11, 13.

[144] FERC, on April 12, 2011, eliminated a PJM rule that allowed a prior exemption for projects to make minimum offer prices when tempered by state energy programs. Mary Powers, *Rebuffed by FERC Ruling, New Jersey BPU Plans to Look Again at How to Attract New Generation*, ELECTRIC UTIL. WK., May 23, 2011, at 4, 6.

[145] Missouri *ex rel.* Mo. Energy Dev. Assoc. v. Pub. Serv. Comm'n, Nos. 10AC-CC00512, 10AC-CC00511, 10AC-CC00513, 10AC-CC00528, 10AC-CC00536 (Cole Cnty., Mo. June 29, 2011), *available at* http://www.realestatedevelopmentlawupdate.com/files/2011/08/Cole-County-Conc-of-Law-on-RPS-challenge-6-29-2011.pdf.

[146] *Id.*

[147] *Id.*

[148] Housley Carr, *Pickens Company, Mesa, Sets up NAFTA Claim Against Canada on Wind Power Issues,* ELECTRIC UTIL. WK., July 18, 2011, at 7.

B. The State Feed-In Tariff as a Legal Option?

1. The Mechanism

Feed-in tariffs are the most widely employed renewable programs in Europe and, increasingly, the rest of the world.[149] Approximately sixty countries, including seventeen European Union countries and Brazil, Indonesia, Israel, Korea, Nicaragua, Norway, Sri Lanka, Switzerland, and Turkey all use feed-in tariffs to promote and support renewable energy.[150] Feed-in tariffs have been successful in encouraging significant renewable energy development in nearly all of the countries in which they have been deployed[151] but can impose significant costs on captive utility ratepayers.

A feed-in tariff establishes a secure contract for wholesale electricity sale at a set price that results in a rate of return attractive to investors and developers. The feed-in tariff rate is based not on what the buying utility wants to pay, but rather on a rate that regulators determined will provide an adequate profit to the seller of the power.[152] Thus, it is not a market transaction, but rather an administrative fiat. Feed-in tariff structures are typically either fixed payments based on an electricity generator's cost to produce electricity or as a fixed premium paid above the spot market or wholesale market price of electricity.[153] These fixed payments are long-term contracts for from five to thirty years in duration.[154] These feed-in tariffs typically exceed substantially utility-avoided costs and therefore are justified solely by their achieved objective and results.[155] Often the fixed-payment feed-in rates and terms are differentiated by technology and are based on the cost of deploying a given renewable energy technology.[156]

Costs of a feed-in tariff are passed on to consumers by purchasing energy suppliers and reflect a regulatory decision to increase the percentage of renewable electricity sources in use. Several of the countries employing feed-in tariffs are trying to reduce what their administrators

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[149] *See* WILSON RICKERSON & ROBERT GRACE, THE DEBATE OVER FIXED PRICE INCENTIVES FOR RENEWABLE ELECTRICITY IN EUROPE AND THE UNITED STATES: FALLOUT AND FUTURE DIRECTIONS (2007).

[150] *Id.*

[151] *See generally* ANNE HELD ET AL., FEED-IN SYSTEMS IN GERMANY, SPAIN AND SLOVENIA: A COMPARISON (2007), *available at* http://www.vdi3925.org/pub/Solar/SolarLiterature/DE_ES_SLO.pdf.

[152] Teresa Morton & Jeffrey Peabody, *Feed-in Tariffs: Misfits in the Federal and State Regulatory Regime?,* ELECTRICITY J., Oct. 2010, at 17.

[153] Wilson H. Rickerson et al., *If the Shoe FITs: Using Feed-in Tariffs to Meet U.S. Renewable Electricity Targets*, ELECTRICITY J., May 2007, at 73.

[154] HELD, *supra* note 151.

[155] 1 FERREY, *supra* note 43 § 5:9.

[156] Janet L. Sawin, *National Policy Instruments: Policy Lessons for the Advancement & Diffusion of Renewable Energy Technologies Around the World*, Thematic Background Paper Presented at the International Conference for Renewable Energies (Jan. 2004), *available at* http://www.worldfuturecouncil.org/fileadmin/user_upload/Miguel/Sawin__2004__National_policy _instruments.pdf.

thought was the correct amount to pay, with some E.U governments, such as Germany, having slashed their initial feed-in tariffs to approximately half their value seven years ago.[157] Those few states that have adopted feed-in tariffs despite their constitutional issues have not fared any better. In 2011, Oregon lowered the price paid under its solar feed-in tariff for the third time in its one year of existence, reducing it from its original 65 cents/Kwh to 37.4 cents/Kwh.[158] Each of the prior iterations at high prices was oversubscribed within less than ten minutes of its availability, even though each time the tariff was lowered ten to twenty percent from the prior availability.[159] While state officials claimed they were looking for the "sweet spot," the "unsweet" spots of each of the former tariff iterations are forced on the bills of rate-paying customers of the utilities for fifteen years.

Feed-in tariffs have not been sanctioned historically in the United States, unlike the RPS.[160] The feed-in tariff promotes renewable power by actually linking the renewable subsidy to the price paid for renewable power, while the RPS does this by creating a separate tradable renewable attribute apart from the value of the power.

Several U.S. states have begun to propose legislation, and a few have begun to adopt policies similar to European feed-in tariffs.[161] The Solar Electric Power Association issued a report in late 2008 urging utilities to adopt feed-in tariffs,[162] apparently not cognizant of the legal pitfalls and ramifications. As many as ten states have introduced actual feed-in tariff legislation, while a handful of others are considering feed-in tariff policies, and a few have adopted feed-in tariffs.

2. Constitutional Article VI Preemption of State Feed-in Tariffs

a. The Bright Legal Line

Feed-in tariffs must be aware of legal constitutional limitations under Article VI in the Supremacy Clause of the Constitution. State feed-in tariffs, until either the U.S. Constitution or the Federal Power Act are altered, are prohibited if mandated by states at prices above the

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[157] *See generally* David Hopwood & Paula Mints, *EPIA: Market Installed 7.2 GW of Solar PV in 2009*, RENEWABLE ENERGY FOCUS, Sept. 10, 2010, http://www.renewableenergyfocus.com/view/12286/epia-market-installed-72-gw-of-solar-pv-in-2009/; *see also Financial Incentives for Photovoltaics*, WIKIPEDIA, http://en.wikipedia.org/wiki/Financial_incentives_for_photovoltaics (last visited July 8, 2012).

[158] Pam Russell, *Oregon Reduces Solar Feed-In Tariff for Third Time, Looking for "Sweet Spot" Price*, ELECTRIC UTIL. WK., Aug. 8, 2011, at 7.

[159] *Id.*

[160] Rickerson et al., *supra* note 153.

[161] *Id.*

[162] Ethan Howland, *Utilities, Solar Developers Should Seek New Procurement Approaches, Report Says*, ELECTRIC UTIL. WK., Dec. 15, 2008, at 26.

utility's avoided cost of purchasing or producing power for any investor-owned utilities which are regulated.[163] Yet, all state feed-in tariffs are designed to do precisely that.

Sections 205 and 206 of the Federal Power Act[164] exclusively empower FERC to regulate rates for the interstate and wholesale sale and transmission of electricity. Section 201(f) of the Federal Power Act exempts municipal or publicly owned utilities from FERC authority. The U.S. Supreme Court, in *Federal Power Commission v. Southern California Edison Co.*,[165] held that Congress meant to draw a "bright line," easily ascertained and not requiring case-by-case analysis, between state and federal jurisdiction. The Act creates this "bright line" between state and federal jurisdiction with wholesale power sales falling on the affirmative *federal* side of the line.[166]

When a transaction is subject to exclusive federal FERC jurisdiction and regulation, state regulation is preempted as a matter of federal law and the U.S. Constitution's Supremacy Clause, according to a long-standing and consistent line of rulings by the U.S. Supreme Court.[167] For example, the Supreme Court overturned an order of the New Hampshire Public Utilities Commission that restrained within the state, for the financial advantage of in-state ratepayers, low-cost hydroelectric energy produced within the state. It held this to be an impermissible

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[163] 16 U.S.C. § 824(a) (2006); 18 C.F.R. § 292.401 (2011); *see also Am. Paper Inst. v. Am. Elec. Power Serv. Corp.*, 461 U.S. 402, 413 (1983).

[164] 16 U.S.C. § 824(d)–(e) (2006).

[165] 376 U.S. 205, 215–16 (1964).

[166] Pub. Util. Dist. No. 1 v. FERC, 471 F.3d 1053, 1066 (9th Cir. 2006) *aff'd in part and rev'd in part sub nom.* Morgan Stanley Capital Grp. Inc. v. Pub. Util. Dist. No. 1, 554 U.S. 527 (2008) (criticizing the reasoning of the Ninth Circuit's decision, but nonetheless upholding that FERC has exclusive authority—and responsibility—to review long-term power crises, wholesale market manipulation by a party to the power sale contract that would negate existing contract protections, and wholesale rates) *vacated*, 547 F.3d 1081 (9th Cir. 2008). The Supreme Court criticized the reasoning of the Ninth Circuit instituting a rate "zone of reasonableness" on FERC determinations, which would be "a reinstitution of cost-based rather than contract-based regulation." *Morgan Stanley*, 554 U.S. at 550–51. The Court did not want to impose this cost calculation burden on FERC regarding every market-based contract. The five–two decision by Justice Scalia upheld the tougher "public interest" standard to only abrogate contracts in those "extraordinary circumstances where the public will be severely harmed," as articulated by the *Mobile-Sierra* doctrine, with a new affirmative twist regarding market manipulation. FERC was told to "amplify or clarify its findings. *Id.* Market turmoil or chaos, even rendering a power market dysfunctional, alone are not sufficient to negate existing wholesale power contracts, which are designed, in part, to hedge against certain market risks. Of the four wholesale contracts at issue in this litigation, one with Dynegy had already expired by its terms at the time of this 2008 Supreme Court decision, and three with Shell, PPM and Sempra had not yet terminated. For a discussion of the California and Western energy crisis that spawned this litigation, see generally Steven Ferrey, *Soft Paths, Hard Choices: Environmental Lessons in the Aftermath of California's Electric Deregulation Debacle*, 23 VA. ENVTL. L.J. 251 (2004).

[167] Mont.-Dakota Co. v. Pub. Serv. Comm'n, 341 U.S. 246, 251 (1951); Nantahala Power & Light Co. v. Thornburg, 476 U.S. 953 (1986); Miss. Power & Light Co. v. Mississippi *ex rel.* Moore, 487 U.S. 354 (1988); Entergy La., Inc. v. La. Pub. Serv. Comm'n, 539 U.S. 39 (2003); New England Power Co. v. New Hampshire, 455 U.S. 331 (1982).

violation of the dormant Commerce Clause and the FPA: "Our cases consistently have held that the Commerce Clause of the Constitution precludes a state from mandating that its residents be given a preferred right of access, over out-of-state consumers, to natural resources located within its borders or to the products derived therefrom."[168] As articulated by the U.S. Supreme Court in its decisions in *Northern Natural Gas Co. v. State Corp. Commission*[169] and *Nantahala Power & Light Co. v. Thornburg*,[170] "the filed rate doctrine is not limited to 'rates' *per se*: 'our inquiry is not at an end because the orders do not deal in terms of prices or volumes of purchases.'"

FERC jurisdiction preempts any and all state regulation of wholesale power transactions and prices. The Federal Power Act defines "sale at wholesale" as any sale to any person for resale.[171] FERC jurisdiction is plenary and extends to all sales in interstate commerce.[172] The U.S. Supreme Court held in *FERC v. Mississippi*[173] that "it is difficult to conceive of a more basic element of interstate commerce than electric energy, a product used in virtually every home and every commercial or manufacturing facility. No State relies solely on its own resources in this respect." State energy-market regulatory reforms elected by certain states have contributed to "a massive shift in regulatory jurisdiction from the states to the FERC."[174]

"FERC has exclusive authority to determine the reasonableness of wholesale rates."[175] Federal law creates a "'bright line' between state and federal jurisdiction with wholesale power sales . . . falling on the federal side of the line."[176] If a utility or independent power producer is subject to FERC jurisdiction and regulation over its wholesale power sales, state regulation of the same operational aspects is preempted as a matter of federal law.[177] This so-called "filed-rate doctrine" in 1986, and again in 1988, 2003, and 2008, was upheld emphatically by the Supreme Court.[178]

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[168] *New England Power*, 455 U.S. at 338.

[169] 372 U.S. 84, 90–91 (1963).

[170] 476 U.S. 953, 966–67 (1986).

[171] 16 U.S.C. § 824(d) (2006).

[172] N. States Power Co. v. Minn. Pub. Util. Comm'n, 344 N.W.2d 374 (Minn. 1984), *cert. denied*, 467 U.S. 1256 (1984).

[173] 456 U.S. 742, 757 (1982).

[174] Pub. Util. Dist. No. 1 v. FERC, 471 F.3d 1053, 1067 (9th Cir. 2006); Entergy La., Inc., v. La. Pub. Serv. Comm'n*,* 539 U.S. 39 (2003).

[175] Miss. Power & Light Co. v. Mississippi *ex rel.* Moore, 487 U.S. 354, 371 (1988); *accord Pub. Util. Dist. No. 1*, 471 F.3d at 1066.

[176] *Id.* (citing Nantahala Power & Light Co. v. Thornburg, 476 U.S. 953 (1986)).

[177] *E.g.*, Ark. Power & Light Co. v. Fed. Power Comm'n, 368 F.2d 376 (8th Cir. 1966); *Nantahala Power*, 476 U.S. 953; *In re* New England Power Co., 424 A.2d 807 (1980).

[178] *Nantahala Power*, 476 U.S. at 963 ("This Court has held that the filed rate doctrine applies not only to the federal-court review at issue in Montana-Dakota, but also to decisions of state courts."); *Miss. Power*, 487 U.S. (filed rate doctrine applies without exception to state regulation of interstate holding companies); Entergy La., Inc., v. La. Pub. Serv. Comm'n, 539 U.S. 39 (2003) (no residual prudency power of the states to alter federal rate or term).

b. The California Constitutional Article VI Adjudications

Attempts by states indirectly or directly to promote higher wholesale energy prices for certain renewable energy projects have been consistently stricken by the courts and by FERC.[179] The U.S. Supreme Court has held that state regulation is not allowed to conflict with federal regulation by layering on additional state requirements as obstacles where the federal government exercises jurisdiction.[180] This particularly applies to pricing of wholesale or interstate power transactions.[181] Promotion of certain types of renewable fuels for power supply, via a renewable resource price preference above and beyond the FERC-established price of other wholesale power transactions at the utility's avoided cost, was held inconsistent with the Federal Power Act and stricken.[182] FERC was also careful to point out that its decision does not preclude the possibility that in setting an avoided cost rate, a state can account for environmental costs of all fuel sources and "real environmental costs" in its calculations.[183]

This language left open the possibility of "green pricing" options or incentives that include RPS RECs. If states impose a rate in excess of avoided cost, however, by either "law or policy," the "contracts will be considered to be void ab initio."[184] Wholesale rates for sales in interstate commerce were wholly beyond any state authority.[185] FERC determined that there were no bases

> under which states have independent authority to prescribe rates for sale by QFs at wholesale that exceed the avoided cost cap contained in [the Public Utility Regulatory Policies Act (PURPA)]. Moreover, for states to mandate rates above avoided costs for a particular class of power suppliers (i.e. QFs) also runs counter to Congress's and the Commission's current policies which strongly favor competition among all bulk power suppliers.[186]

This longstanding precedent was reaffirmed and clarified in a FERC declaratory order in 2010 when California argued that its environmental purposes should make it exempt from preemption in setting above-market wholesale feed-in renewable tariff rates for cogeneration

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[179] *E.g.*, Indep. Energy Producers Ass'n v. Cal. Pub. Utils. Comm'n, 36 F.3d 848 (9th Cir. 1994) (finding no separate basis for the state Public Utilities Commission to act to establish a premium price for renewable low-carbon power projects).

[180] Pac. Gas & Elec. Co. v. State Energy Res. Conservation & Dev't Comm'n, 461 U.S. 190, 204 (1983); Hines v. Davidowitz, 312 U.S. 52, 67 (1941).

[181] Indep. Energy Producers Ass'n v. Cal. Pub. Util. Comm'n, 36 F.3d 848 (9th Cir. 1994); S. Cal. Edison Co., 70 F.E.R.C. ¶ 61,215 (1995).

[182] S. Cal. Edison Co., 71 F.E.R.C. ¶ 61,269 (1995).

[183] *Id.* at 62,080.

[184] Conn. Light & Power Co., 70 F.E.R.C. ¶ 61,012, 61,029–30 (1995).

[185] *Id.* at 61,030.

[186] *Id.* at 61,029.

facilities of less than twenty Mw and that environmental costs could be considered avoided costs.[187] The affected utilities and others countered that federal law does not allow state regulation of wholesale sales to achieve state environmental goals, that federal preemption cannot be avoided based on an environmental purpose of the preempted state regulation, and that states may not under the guise of environmental regulation adopt an economic regulation that requires purchases of electricity at a wholesale price outside the framework of the Federal Power Act, or if acting under PURPA, at a price that exceeds avoided cost.[188] FERC held that wholesale generators can receive no more than system-wide avoided cost for power sales:

> [E]ven if a QF has been exempted pursuant to the Commission's regulations from the ratemaking provisions of the Federal Power Act, a state still cannot impose a ratemaking regime inconsistent with the requirements of PURPA and this Commission's regulations—i.e., a state cannot impose rates in excess of avoided cost.[189]

FERC rejected all of California's arguments regarding generic environmental rationales for wholesale rates in excess of limits under federal law or set by FERC.[190] After losing its petition, California moved for FERC rehearing, or in the alternative a clarification of this FERC order.[191] While FERC dismissed a rehearing to address whether California authority over wholesale power sale rates was preempted,[192] it did issue a clarification that the avoided costs determined for a Qualifying Facility ("QF") selling power to the utility could be determined (1) with respect to actual costs incurred by the purchasing electric utility and (2) reflecting requirements or restrictions imposed under state law on the technologies eligible, thus yielding different tariffs for different technologies subject to state law supply mix requirements.[193] This clarifies that a state can utilize its long-standing authority to specify what mix of power generation technologies a regulated utility should procure going forward.

Consequently, a state could require that a certain amount of a specific renewable power should be procured by a utility. FERC turned down California's argument that avoided cost did not have to be the lowest cost for procurement of a particular type of technology or power resource.[194] The avoided cost that a utility would be ordered to pay for this technology, subject to technology supply requirements, would be the cost at which the *particular* purchasing utility could either itself construct *or* purchase. This is still a real limitation pursuant to the Federal Power Act and the Filed Rate Doctrine applying the Supremacy Clause, as this PURPA avoided

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[187] Cal. Pub. Util. Comm'n, 132 F.E.R.C. ¶ 61,047 (2010).
[188] Conn. Light & Power Co., 70 F.E.R.C. at 61,029.
[189] Cal. Pub. Util. Comm'n, 133 F.E.R.C. ¶ 61,059 (2010).
[190] *Id.*
[191] *Id.*
[192] *Id.* at 61,264, 61,265.
[193] *Id.* at 61,265.
[194] *Id.* at 61,263–64.

cost cannot exceed the most economical cost avoided by the utility finding the best option for this particular type of power from anywhere deliverable to its grid. Since the Obama Administration is trying to integrate grids over large areas, this is a robust and geographically diverse market area.

None of the feed-in tariffs implemented or proposed in U.S. states at the time of this October 2010 FERC decision did this. California added an arbitrary ten percent bonus or adder for all combined heat and power (CHP) facilities as a non-specific transmission system proxy value generically not based on particular location "for every kilowatt hour delivered to the electrical grid . . . at a price determined by the Commission,"[195] regardless of where the CHP was located or which utility system it was in.[196] In the U.S. transmission and distribution system, the cost of serving different areas with power, and thus the value of non-serving each area, is distinct and not uniform.[197]

This does not mean that a state could not justify avoided cost adders, but just that it must do so more precisely than merely picking an arbitrary uniform state value that ignores actual transmission costs and benefits. FERC reaffirmed its prohibition of additions to avoided costs that reflect general environmental externality bonuses or adders, unless they "are real costs that would be incurred by utilities."[198] A state could quantify the distinct benefits for transmission, distribution, reliability, capacity, peak-time availability, line losses avoided for the system, length of commitment, and other factors for specific transmission locations and nodes.[199]

This 2010 FERC opinion clarifies the issue in FERC's 1995 decision,[200] that different technologies could be subject to different avoided costs, if and only if the amount, location, and "ability to sell to the utility" for these technologies is differentially constrained by state law.[201] However, no state with a feed-in tariff had taken such steps or done such a detailed determination when FERC issued its 2010 opinions. California, in fact, had not justified its feed-in tariff even as an avoided cost or as implemented under its limited authority under PURPA.[202] Instead, it justified its feed-in tariff as "to encourage cogeneration by requiring utilities to sign contracts."[203] This did not utilize the limited state authority to establish wholesale power sale rates under

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[195] *Id.* at 61,262.
[196] *Id.* at 61,263.
[197] Massimo Filippini & Jörg Wild, *Regional Differences in Electricity Distribution Costs and Their Consequences for Yardstick Regulation of Access Prices*, 23 ENERGY ECON. 477, 477 (2001), *available at* http://www.sciencedirect.com/science/article/pii/S0140988300000827.
[198] Cal. Pub. Util. Comm'n, 133 F.E.R.C. at 61,267 (citing and upholding S. Cal. Edison, 71 F.E.R.C. ¶ 61,269).
[199] *Id.* at 61,265–66.
[200] S. Cal. Edison, 71 F.E.R.C. § 61,269.
[201] Cal. Public Utils. Comm'n, 133 F.E.R.C. at 61,267.
[202] *Id.* ¶ 61,262.
[203] *Id.*

PURPA as a delegate of federal FERC authority, but instead justified the state wholesale tariff as an undocumented above-market incentive to producers of power.

The focus on paying the QF generators whatever price would incentivize them to build projects fundamentally violates the avoided cost principle in federal law, which instead sets avoided cost at the procurement cost in the market to the utility (and its ratepayers). This FERC 2010 order and clarification still preempts the European-style and to-date U.S. state calculations of high feed-in tariffs. The California FERC decision extends beyond the particular cogeneration technology at issue in that decision and extends to wind, solar, and other feed-in tariffs.[204] In its two California decisions, FERC refused California's request to specify that facilities interconnected at the distribution level, rather than the transmission level, are beyond FERC's authority.[205] Instead, FERC reaffirmed that the Federal Power Commission has "exclusive jurisdiction."[206] FERC reaffirmed that location geographically or on the transmission system was not legally relevant, only the nature of the wholesale sale.[207]

Observers note that this leaves states with no way around this jurisdictional line through either a negotiated sale or by claiming that they are regulating buyers of power and not the sellers.[208] FERC leaves open the possibility for states to do what they have not done previously: specify the particular renewable or cogeneration technologies that they want to constitute a percentage of the wholesale energy supply, and then carefully quantify the non-commodity value of this power for transmission and distribution relief, reliability, diversity of supply source, reliability in terms of small power's contribution to a larger number of suppliers, and resiliency against outage. FERC also reaffirmed that since a state cannot add a bonus or adder to the tariff that is not real and actually incurred by the buying utility, a bonus can be supplied "outside the confines of, and, in addition to the PURPA avoided cost rate, through the creation of renewable energy credits (RECs)."[209]

FERC-approved preemptive wholesale rates occur even in those states where FERC has authorized a market mechanism to take bids that establish rates, in lieu of rates set traditionally through direct administrative regulation: "while market-based rates may not have historically been the type of rate envisioned by the filed rate doctrine, we conclude that they do not fall

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[204] *See, e.g.*, David P. Yaffe, *Are State Renewable Feed-In Tariff Initiatives Truly Throttled by Federal Statutes after the FERC California Decision?*, ELECTRICITY J., Oct. 2010, at 9.

[205] Cal. Pac. Elec. Co., 133 F.E.R.C. ¶ 61,018, 61,074 (2010); Cal. Pub. Util. Comm'n, 132 F.E.R.C. ¶ 61,047, 61,339 (2010)

[206] Cal. Pub. Util. Comm'n, 132 F.E.R.C. ¶ 61,047, 61,339 (citing Fed. Power Comm'n v. S. Cal. Edison Co., 376 U.S. 205 (1964)).

[207] *Id.*

[208] Morton & Peabody, *supra* note 152, at 17.

[209] Cal. Pub. Util. Comm'n, 133 F.E.R.C. ¶ 61,059, 61,268 (2010).

outside of the purview of the doctrine."[210] "Even in the context of market-based rates, FERC actively regulates and oversees the setting of rates" and market-based rates are "within FERC's exclusive jurisdiction over wholesale rates."[211]

Some commenters have correctly observed that the 2010 FERC articulation of the total lack of state authority over wholesale power sale policy was nothing new, but the reemphasis of the basic jurisdiction since the beginning of power and its regulation seventy-five years ago:

> FERC's FIT Order did not create a new policy dilemma; it simply reminded California and the states that the states' rights to establish policy concerning electric generation resource selection does not include power to impose prices under state law where sale of electricity for resale and any form of interstate transmission are involved.[212]

After the FERC California decision, the National Association of Regulatory Utility Commissioners (NARUC), representing state regulators, immediately passed a resolution asking Congress to nullify the Agency's decision.[213] Some, including the California Attorney General Jerry Brown (who has since become the governor of California), have argued that mandating that regulated utilities only "offer" to purchase wholesale power at substantially above wholesale market rates is different than a requirement to actually "purchase" the sold power.[214] This argument was held unpersuasive by FERC in 2010.[215]

For context, constitutional issues are not the only impediment to renewable energy implementation. Some renewable projects have encountered other price-related or environmental regulatory obstacles. The California Public Utilities Commission rejected utility PG&E's proposal for a large wind farm as too costly and risky to ratepayers.[216] A federal court judge temporarily enjoined the separate 709 Mw Tessara Solar project in the Imperial Valley in a suit by a Native American tribe alleging lack of sufficient consultation from the Department of Interior Bureau of Land Management[217] and ordered the parties to engage in settlement

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[210] Pub. Util. Dist. No. 1 v. IDACORP, Inc., 379 F.3d 641, 651 (9th Cir. 2004).

[211] *Id*. at 649; *accord* Pub. Util. Dist. No. 1 v. FERC, 471 F.3d 1053, 1080 (2006), *aff'd in part and rev'd in part sub nom.* Morgan Stanley Capital Grp., Inc. v. Pub. Util. Dist. No. 1, 554 U.S. 527 (2008); Town of Norwood v. New Eng. Power Co., 202 F.3d 408, 419 (1st Cir.), *cert. denied*, 531 U.S. 818 (2000).

[212] Yaffe, *supra* note 204.

[213] *Id.*

[214] *Id.*

[215] *Id.*

[216] Lyn Corum, *CPUC ALJ Rejects PG&E's Proposal for 246-Mw Wind Farm as Too Costly*, ELECTRIC UTIL. WK., Jan. 3, 2011, at 8.

[217] Jeffrey Ryser, *Tessara California Solar Project Hits Bump as US Judge Orders Halt to Construction*," ELECTRIC UTIL. WK., Dec 20, 2010, at 17.

negotiations.[218] The Sierra Club sued to enjoin the 663 Calico Solar Project, alleging that California's rush was in conflict with "longstanding environmental laws."[219]

Oregon, which has a feed-in tariff, was criticized in hearings because its subsidy was not transparent or disclosed, alleged to be inequitable, and too high in price.[220] A business professor who profited from the feed-in tariff confessed that it was much too profitable.[221] Notwithstanding this, the Oregon PUC continued the feed-in tariff unchanged at a rate of fifty-five to sixty-five cents per Kwh for solar generation less than 100 Kw, or about six times the value of the wholesale power to the system.[222]

Two utilities in Indiana have recently-approved feed-in tariffs.[223] The feed-in tariff for Indianapolis Power & Light was opposed by the utility in 2011, claiming that a program designed for smaller distributed generation was being used by third-party developers of two to ten Mw stand-alone projects who were not customers of the utility.[224] The utility wanted to prevent stand-alone, rather than distributed, generation projects.[225] The Virginia Corporation Commission and the Kentucky Public Service Commission denied above-market wind power purchase agreements.[226]

The Federal Power Act precludes all state regulation of interstate wholesale power transactions.[227] This renders the European-used option of above-market feed-in tariffs legally inaccessible to adaptation by American states under current law, except in the context of PURPA rates limited to purchasing utility avoided cost.[228] This leaves the RPS, as now adopted by more than half the states,[229] and net metering[230]—assuming that neither design violates Article I of the

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[218] Jeffrey Ryser, *Judge Tells Tribe to Enter Settlement Talks with BLM on California Solar Project*, ELECTRIC UTIL. WK., Jan. 10, 2010, at 4.

[219] *Id.* at 6.

[220] Pam Radtke Russell, *Oregon Parties Tell PUC Changes Are Needed in Six-Month Old Solar Feed-In Tariff Program*, ELECTRIC UTIL. WK., Dec. 2010, at 21.

[221] *Id.*

[222] *Id.*

[223] N. Ind. Pub. Serv. Co., No. 43922, 2011 WL 2908620 (Ind. Util. Regulatory Comm'n July 13, 2011) (pays as much as twenty-six cents/Kwh for PV project power sales from up to two Mw projects, which rate can be locked in for up to ten years; Indianapolis Power & Light Co. also has a feed-in tariff.)

[224] Bob Matyi, *IP&L Seeks Revision of Year-Old Pilot Feed-In Tariff to Keep Merchants from Taking Advantage*, ELECTRIC UTIL. WK., July 11, 2011, at 17.

[225] *Id.*

[226] Matthew Wald & Tom Zeller, *Cost of Green Power makes Projects Tougher Sell*, N.Y. TIMES, Nov. 10, 2010, at A1.

[227] Nantahala Power & Light Co. v. Thornburg, 476 U.S. 953 (1986); *see also* Miss. Power & Light Co. v. Miss. *ex rel.* Moore, 487 U.S. 354, 371 (1988); *accord* Miss. Indus. v. FERC, 808 F.2d 1525, 1535–49 (D.C. Cir. 1985), *cert. denied,* 484 U.S. 985 (1985).

[228] 18 C.F.R. § 292.401 (2011).

[229] *See supra* Part II.A.1.

Constitution—as the legally viable alternatives to monetarily provide incentives for the adoption of renewable power technologies for power generation by independent power producers in the United States.

C. Net Metering of Renewable Energy and Legal Jurisdiction

1. The Mechanism

As of 2011, forty-three states and the District of Columbia had some form of net metering, which operates the retail utility meter backwards when a renewable energy generator puts power back to the grid.[231] Net metering can credit the eligible renewable energy source up to four times more for this power when it rolls backwards the retail rate, than paid to any other independent power generators for wholesale power, and much more than the time-dependent value of this power to the purchasing utility.[232]

Some states that allow net metering put a limit on the percentage of total supply that can be net metered, to avoid the problem of net metering power back to the utility when the utility does not need the power. Certain states limit the amount of power that can be net metered, to restrict it to incidental sale of incremental power, rather than a surplus payment to a commercial production of power. In Maryland, a controversy occurred in 2010 over limitations of solar output to be net metering to 125% of total monthly usage through the meter.[233] The early state positions on net metering are set forth in Table 2.

Table 2: State Net Metering Regulations in Early Adopter States

State	Eligible Technologies	Eligible Customers Limits	Size	Price	Authorization
Arizona	Renewables & cogeneration		≤ 100 kW	Excess* purchased at avoided cost	Ariz. Corp. Comm. Decision No. 52345
California	Solar and wind	Residential and Small Commercial	≤ 10 kW	Excess purchased at avoided cost; month-to-month carryover allowed	Calif. Pub. Util. Code §2827

[230] *See infra* Part II.C.

[231] *See* DSIRE, *supra* note 4 (last visited May 22, 2012) (re net metering by the states).

[232] Typically, the retail tariff for power is approximately three times the wholesale power component, which is only one piece of the charge for electric service.

[233] Mary Powers, *Maryland Regulatory Staff Takes Side of Solar Producers on Net Metering Issues*, ELECTRIC UTIL. WK., Aug. 16, 2010, at 24.

State	Eligible Technologies	Eligible Customers Limits	Size	Price	Authorization
				w/utility consent	
Colorado	All resources		≤ 10 kW	Excess carried over month-to-month	Pub. Svc. Co. of Colo., Advice Letter 1265; Decision C96-901
Connecticut	Renewables & cogeneration		≤ 50 kW for cogeneration; ≤ 100 kW for renewables	Excess purchased at avoided cost	Dept. of Pub. Util/ Control, Order No. 159
Idaho	Renewables & cogeneration	Residential and small commercial	≤ 100 kW	Excess purchased at avoided cost	ID PUC Orders Nos. 16025 (1980); 26750 (1997)
Indiana	Renewables & cogeneration		≤ 1,000 kWh/month	Excess is "granted" to the utility; No purchase of excess	170 IN Admin. Code §4-4, 1-7
Iowa	Renewables		No size limit	Excess purchased at avoided cost	Iowa Util. Bd., Utilities Division Rule §15.11(5)
Maine	Renewables & cogeneration		≤ 100 kW	Excess purchased at avoided cost	Me. PU Code Ch. 36, §§1(A)(18), (19), §4(C)(4)
Maryland	Solar	Residential	≤ 80 kW	Excess carried over to following month	Maryland Art. 78, §54M
Massachusetts	Renewables & cogeneration		≤ 60 kW = Class I Between 60 kW and 1 MW = Class II Between 1-2 MW = Class III[234]	Excess purchased at avoided cost	Mass. Gen. Laws c. 164, §1G(g); D.T.E. Order 97-111 Note: ≤ 30 kW 220 CMR §8.04(2)
Minnesota	Renewables & cogeneration		≤ 40 kW	Excess purchased at "average retail utility energy rate"	Minn. Stat. §261B.164(3)
Nevada	Solar and wind		≤ 10 kW	Excess purchased at avoided cost; annualization allowed	Nev. R. Stat. Ch. 704
New Hampshire	Solar, wind & hydro		≤ 25 kW	PUC may require 'netting' over 12-month period; retailing	

[234] An Act Relative To Green Communities, 2008 Mass. Acts 359 (providing for Class I, II, III, neighborhood, solar and wind net metering facilities with wind and solar up to two MW allowed to net meter).

State	Eligible Technologies	Eligible Customers Limits	Size	Price	Authorization
				wheeling allowed for up to 3 customers	
New Mexico	Renewables, fuel cells, micro turbines		≤ 1,000 kW	Excess credited to following month; unused credit is granted to utility at end of 12-month period	NM PUC Order 2847 (11/30/98)
New York	Solar	Residential	≤ 10 kW	Excess credited to following month; unused credit is granted to utility at end of 12-month period	NY Public Service Stat. §66-j
North Dakota	Renewables & cogeneration		≤ 100 kW	Excess purchased at avoided cost	N.D. Admin. Code §69-09-07-09
Oklahoma	Renewables & cogeneration		≤ 100 kW and annual output ≤ 25,000 kWh	Excess is "granted" to the utility; no purchase of excess	Ok. Corporations Comm. Schedule QF-2
Pennsylvania	Renewables		≤ 50 kW	Excess purchased at wholesale rate	PECO Rate R-S, Supp. 5 to PA Tariff PUC No. 2, Page 43A
Rhode Island	Renewables & cogeneration		≤ 25 kW for larger utilities; ≤ 15 kW for smaller utilities	Excess purchased at avoided cost	PUC Supp. Decision and Order, Docket No. 1549
Texas	Renewables		≤ 50 kW	Excess purchased at avoided cost	Texas PUC, Rule §23.66(f)(4)
Vermont	Solar, wind, fuel cells using renewable fuel, anaerobic digestion	Residential, commercial, and agricultural customers	≤15 kW, except ≤ 100 kW for anaerobic digesters	Excess carried over month-to-month; any residual excess at end of year is "granted" to the utility	Reuse of Net Metering, VT. PSB Docket No. 6181 (April 21, 1999)
Washington	Solar, wind and hydropower		≤ 25 kW	Excess credited to following month; unused credit is granted to utility at end of 12-month period	
Wisconsin	All Resource	All retail customers	≤ 20 kW	Excess purchased at retail rate for renewables, avoided cost for non-renewables	Pub. Svc. Comm. Schedule PG-4
Connecticut	Solar, wind, hydro, fuel cell, sustainable	Residential	No size limit	Not specified	CT Public Act 98-28 (1998)

State	Eligible Technologies	Eligible Customers Limits	Size	Price	Authorization
	biomass				
Illinois (pending)	Solar and wind	All retail customers	≤ 40 kW	Excess carried over month-to-month; any residual excess at end of year is purchased at avoided cost	Ill. Legis. S.B. 1228
Maine	Renewables or other applicable technology		≤ 100 kW	Excess carried over month-to-month; any residual excess at end of 12-month period is eliminated	Me. PU Code Ch. §313 (1998); PUC Order No. 98-621 (December 19, 1998). [35-A MRSA §3210(2)(C)]
Puerto Rico (pending)	Renewables	Residential	≤ 50 kW	Excess carried over month-to-month; any residual excess at end of year is purchased at avoided cost	

* **"Excess" refers to the "net excess generation" of electricity by the customer-generator (i.e., generation exceeds consumption) during the billing period.**

Among the forty-three states that have adopted net metering as a basic program, some have gone even further. Oregon ruled that a customer could hire a third party to own and/or install and operate the self-generation unit on its premises that supplied power behind the meter.[235] Therefore, a prior sale could not be a "sale for resale" of power if the subsequent net-metered transaction was not a sale at all.[236] If the renewable net-metered facility takes advantage of multiple federal and state trust fund subsidies and tax credits and benefits, it is still eligible for net metering, and the third-party owner of the renewable generation equipment can still earn RECs under the separate Oregon RPS program.[237] The ability to "quadruple-dip" into RECs, net metering, tax incentives, and system benefit trust funds or other subsidies is not uniformly allowed by all states.

[235] Honeywell Int'l, Inc., No. 08-388, 2008 WL 3020892, at *5 (Or. Pub. Util. Comm'n July 31, 2008) (interpreting Or. Rev. Stat. Ann. § 757.300).

[236] *Id.* at 7 (relying on the FERC determination in MidAmerican Energy Co., 94 F.E.R.C. ¶ 61340, 62,263 (2001)). The Oregon Commission also held that the third-party owner of the net metered generator was not a retail electric service provider under state law because it does not generally offer service other than to selected on-premises parties, did not use the utility's distribution system, and did not provide any ancillary services. It also was not a utility and did not have to serve 100% of the premises' load. The regular public utility must serve all other power and back-up needs of the customer.

[237] *Id.*at 14.

Massachusetts has gone the furthest of all, adopting a community net metering amendment that looks a lot like the telecommunications "friends and family" program.[238] One can designate anyone in the same utility service territory as someone whose metered retail electricity consumption also can be rolled backwards due to sales from an unrelated net-metered renewable power project.[239] In other words, if one's solar collector or wind turbine produces more power than one consumes, one can roll one's own retail meter back to zero to reflect no net consumption, and simultaneously roll back the net consumption on other meter(s) in the community. By creating a legal hypothetical premise of shared on-site power consumption from one source at unrelated locations, this ensures that the entire net wholesale-distributed, net generation quantity will be credited at retail rates by rolling back some retail meters.

In Massachusetts, this allows one's surplus and unused distributed renewable power to be treated as if it were produced and used on site at another location in the same utility geographic service territory, although that power is not produced there and the other customer produces no distributed power at all, nor does the power physically ever reach that other customer. As a legal concept, one rolls back multiple retail meters where the retail (including transmission and distribution charges, taxes, and regulatory costs), not wholesale, price of power is credited at a recent $0.12 - $0.17/Kwh, or approximately 300% of the actual market value of wholesale power through this legal convention. Although there are six states (California, Oregon, Pennsylvania, Rhode Island, Washington, and West Virginia) that allow an owner who has multiple meters on its property to apply the net metered sale to all of its meters,[240] to date, Massachusetts is the only state to allow such a regulatory "virtual" unrelated net meter accounting, and this new program has not been challenged in court.

Parties, including the attorney general, questioned whether the Massachusetts regulation allowing virtual net metering conflicts with Massachusetts law or is otherwise *ultra vires*.[241] In Rhode Island, there is a pending challenge to net metering where the wind generator at the Portsmouth High School is directly interconnected to the distribution grid, rather than first serving a substantial host load.[242] The argument is that as an independent wholesale project, it can be paid no more than the avoided cost afforded to QFs under PURPA, rather than the net metered calculation, which is approximately 300% of avoided cost.

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[238] 220 MASS. CODE REGS. § 11.04(7)(C) (2008).

[239] *Id.*

[240] Ethan Howland, *Arizona Eyes Aggregated Net Metering Plan Similar to Programs in Six States*, ELECTRIC UTIL. WK., Dec. 6, 2010, at 19, 19.

[241] *See In re* Net Metering, 276 P.U.R.4th 237, 248–49 (Mass. D.P.U. 2009); *In re* Green Communities Act, No. 08-75-A, 2009 WL 1904566, at *8 (June 26, 2009); 220 Mass. Code Regs. 18.00 (2012).

[242] Complaint of Benjamin Riggs and the Town of Portsmouth Generator Facility, R.I. Pub. Utils. Comm'n Docket No. D-10-126 (May 19, 2010), *available at* http://www.ripuc.org/eventsactions/docket/D-10-126-Riggs-Complaint(5-24-10).pdf.

2. Skirting Constitutional Restrictions

By turning the meter backwards, net metering effectively compensates the generator at the full retail rate for transferring just the wholesale energy commodity. The power surplus under net metering is credited in thirty-nine of the states at the retail rate, and in four states at the wholesale rate.[243] Since this is just a temporary client "banking" function, this rate distinction is not critical. About half of the states do not allow these credits to be turned into cash value as opposed to banked credits, and most do not allow the credits to be transferred.[244] In such situations, the credits can never be transferred to other accounts or customers, so this is a distinction that just holds power credit without depreciation.

Twenty-three of the forty-three net metering states will pay a cash value to net-metered customers for surplus credits. However, all but two of these twenty-three will only calculate the cash value at avoided cost, while two do it at a higher rate. The avoided cost of the power is its wholesale value, so this reflects its actual market value under PURPA.[245] As such, states are allowed to set the avoided cost of this power sale.[246] As a result, all but a couple of the states can navigate to a constitutional "safe harbor" that protects their programs from challenge under Article VI.

In 2001, FERC held that state net metering decisions were not preempted by federal law.[247] FERC held that no sale occurs when an individual installs distributed generation and accounts for its dealings with the utility through the practice of netting.[248] In a somewhat ambiguous decision, it concluded that a change of title to power not to constitute a "sale."[249] Net metering, at least as long as there is no significant net transfer of power back to the utility, is not deemed a retail or wholesale sale of power and therefore not subject to any federal law limitations on the price implications of net metering.[250]

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[243] DATABASE ST. INCENTIVES FOR RENEWABLES & EFFICIENCY, http://www.dsireusa.org/incentives/allsummaries.cfm?SearchType=Net&&re=1&ee=1 (last visited May 17, 2012).

[244] *Id.*

[245] 16 U.S.C. § 824a-3 (2006).

[246] *Id.*; Cal. Pub. Util. Comm'n 132 F.E.R.C. ¶ 61047 (2010).

[247] *See* MidAmerican Energy Co., 94 F.E.R.C. ¶ 61,340, 62,262 (2001). In March 2001, MidAmerican Energy Company challenged before FERC the state of Iowa's regulations "directing MidAmerican to interconnect with three Alternate Energy facilities and to offer net billing arrangements to those facilities." *Id*. at 62,261. MidAmerican also requested a declaratory order that federal law preempted these regulations. *Id.* MidAmerican asked the commission to undertake enforcement action against the Iowa Board, or to issue a declaratory order that the final orders of the Iowa Board are preempted by PURPA. *Id.* at 62,261 n.1.

[248] *Id.* at 62,263.

[249] *Id.*

[250] *Id.* at 62,263–64.

However, the application of this exemption is more recently in some doubt. In its relatively recent decision in *Sun Edison LLC*,[251] FERC reiterated that net metering practices under state regulations are not wholesale power sale transactions. However, this 2009 decision places very solid brackets around the earlier 2001 decision of FERC in *MidAmerican*: this exemption is only applied to temporary energy banking, not a net "put" of power to the utility; it does not specifically sanction the net export of power to the grid under its *SunEdison* facts, and it constrains state jurisdiction over net metered wholesale transactions to where the net flow of power is from the utility to the customer.[252] Few states have seemed to notice this subsequent FERC net metering decision.

This legal holding is counterbalanced by the fact that many states limit the size of net metering facilities to something approaching the size of the host customer power use, so that there is no net surplus at the end of a billing period. With the exception of Massachusetts, there is a prohibition on the "virtual" transfer of net metering credits to unrelated customers. Some states also have the holder forfeit unused credits at the end of a year. Each of these limitations has the effect of reducing the possibility of net credits, which solves the net flow issue raised in the most recent FERC *SunEdison* decision. These program deign elements, when coupled with those states that prohibit cash payments for net metered credits, keep almost all net metering programs well-spaced away from constitutional issues.

D. Direct Renewable Subsidies

1. The Mechanism

There are ways to provide an incentive for the deployment of renewable generation resources. Primarily, these include federal tax incentives, RPS requirements, and promotional feed-in tariffs paid for by the sale and delivery of renewable energy, as discussed above. An additional mechanism is the state system benefit charge and renewable trust funds. These are set forth in Table 3 for representative Northeast states.

A systems benefits charge (SBC) is a per-kWh power charge imposed on all electricity consumers within a state. As of May 2009, approximately one third of U.S. states have enacted SBC and "renewable trust funds" as a direct subsidy mechanism to support the development of renewable energy resources.[253] Eighteen states plus the District of Columbia have established

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[251] 129 F.E.R.C. ¶ 61146, 61,618 (2009).

[252] *Id.* at 61,620–21.

[253] ELIZABETH DORIS, ET AL., NAT'L RENEWABLE ENERGY LAB., TECHNICAL REP. NO. NREL/TP-6A2-46667, STATE OF THE STATES 2009: RENEWABLE ENERGY DEVELOPMENT AND THE ROLE OF POLICY (2009), *available at* http://www.nrel.gov/docs/fy10osti/46667.pdf.

renewable trust funds in the United States.[254] States raise revenues for these renewable trust funds through a small surcharge on electricity bills.[255] These state renewable trust funds distribute money to subsidize various renewable energy resource projects and technologies pursuant to state legislation.[256]

At the state level, the SBC is like a tax on utility consumption, or surcharge mechanism, for collecting funds from electric consumers, the proceeds of which then support a range of energy activities. In order to support either demand-side management (DSM) or renewable resources, funds are collected through a non-bypassable SBC to users of electric distribution services.[257] The money raised from the SBC is then used to "buy down" the cost of power produced from sustainable technologies on both the supply and demand side, so that they can compete with more conventional technologies.[258]

Between 1998 and 2012, approximately $3.5 billion will have been collected by fourteen states with existing renewable SBCs to endow energy trust funds.[259] More than half the amount collected, at least $135 million per year, comes from just California. As of 2006, U.S. states' energy trust funds had committed almost $400 million to support 2,249 MW of renewable energy capacity.[260] Most only provide assistance to new projects and not to existing renewable projects. The funding levels of these state charges on electric distribution range from $0.07/MWh in Wisconsin up to almost $0.6/MWh in Massachusetts.[261] The mean value is about 0.1 cents/kWh of consumption.[262]

Table 3: Seven Northeast State Public Benefits Funding Renewable Projects

State	Funding	Renewables Uses and Eligibility
Connecticut	• 0.5 mills/kWh in 2000 0.75 mills in 2002	• Solar, wind, ocean thermal, wave, tidal, landfill gas, low

[254] *Public Benefits Funds for Renewables,* DATABASE ST. INCENTIVES FOR RENEWABLES & EFFICIENCY, http://www.dsireusa.org/documents/summarymaps/PBF_Map.ppt (last visited May 22, 2012).

[255] DORIS ET AL., *supra* note 253.

[256] *Id.*

[257] 1 FERREY, *supra* note 43 § 10:95 & n.3.

[258] *Id.*

[259] MARK BOLINGER & RYAN WISER, LAWRENCE BERKELEY NAT'L LAB., THE IMPACT OF STATE CLEAN ENERGY FUND SUPPORT FOR UTILITY-SCALE RENEWABLE PROJECTS (2006), *available at* http://eetd.lbl.gov/ea/ems/cases/lbnl-56422.pdf.

[260] *Id.*

[261] *Id.*

[262] MARTIN KUSHLER ET AL., AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., REP. NO. U04, FIVE YEARS IN: AN EXAMINATION OF THE FIRST HALF-DECADE OF PUBLIC BENEFIT ENERGY EFFICIENCY POLICIES (2004), *available at* http://www.fypower.org/pdf/ACEEE_PGC_Study.pdf.

State	Funding	Renewables Uses and Eligibility
	1 mill in 2004 - $28 million/year average through 2012 • Fund reduced by approximately 33% in FY04 and for next 7 years to pay back bonds issued to cover state budget deficit.	emission biomass, fuel cells. Economic development and renewables for customers. May invest in renewable projects outside of state.
Massachusetts	• Averages 0.95 mills/kWh first 5 years = $40 million per year. 0.25 mills dedicated for MSW pollution controls or retirement. 0.5 mills thereafter (no MSW) ~$20-$25 million/year.	• New solar, wind, ocean, advanced biomass, fuel cells, possibly DSM and distribution generation.
New Jersey	• 1.8 mills/kW·h for energy efficiency and Class I renewables for first 4 years; 2.1 mills/kWh next 4 years (min. of $107.5 million/yr through 2008). 75% of funds for efficiency $9~105 million/yr avg) 25% of funds for Class I renewables (~$35 million/yr avg) • 2001 BPU Order sets initial 3 year (2001-2003) funding level at $358.5 million (75% for efficiency, 25% of Class I renewables).	• Class I renewables (wind, PV, solar thermal, biomass, fuel cells, LFG, wave/tidal, and geothermal.) • Allocation of renewable energy funds is 60% customer sites, 40% grid supply in 2001, and split 50/50 each year thereafter.

State	Funding	Renewables Uses and Eligibility
New York	• 0.6 – 1.0 mills/kWh per utility; avg. ~0.7 mills ~$78 million/yr for 3 years (1999-2001) Efficiency = 67%; renewables/R&D = 18%; low-income = 14% $17 million over three years for renewables (including $4 million from Niagara Mohawk) Fund extended at $150 million/yr for 5 years. $70 million over 5 years for renewables, including $47.5 million for wind power, and the rest for biomass and solar.	• Wind, solar, biomass. • Competitive bidding by technology. Funding programs include grants, loans, guarantees, investments, buy downs, and rebates.
Rhode Island	• 2.3 mills/kWh 1997-2012, (2.0 mills/kWh for DSM programs and 0.3 mills/kWh for renewables) ~$17 million/yr, with 2.5 million/yr for renewable	• Wind, solar, sustainable, biomass, existing hydro 100 MW or less.

- Reflects the sum of the annual average of each fund. Since funds have different durations, actual annual funding amounts will vary.

The funding level is in the range of $175–$250 million annually for the cumulative impact of the fourteen state renewable energy SBC and trust fund programs.[263] While many of these programs are set up to run indefinitely, others have set lifespans. The level of per-capita funding ranges between $0.90 and $4.40 annually for renewable energy.[264] Expressed another way, for each megawatt hour sold in the state, the level of subsidy ranges from $0.07 to $0.59.[265]

2. The Legal Dimension

The SBC and renewable trust fund, since they do not directly set the terms or prices of the sale of wholesale power, are much like a tax. Therefore, they are within general state powers and are not directly affected by the Federal Power Act. However, application of this this tax must be evenhanded and not discriminate against interstate commerce based on place of origin of the

[263] *Id.*
[264] *Id.*
[265] *Id.*

power.[266] A state's primary interest with an SBC is to support the in-state renewable energy industry and economic development. Therefore, it is likely that a state will want to retain the funds collected from an SBC program to subsidize or provide incentive for in-state industries and development.[267] However, the effectuation of the desire to retain subsidy funds for in-state benefit raises the dormant Commerce Clause constitutional issue of discriminating against out-of-state electricity producers.[268]

As long as the tax is imposed even-handedly at the retail level, and/or over power distribution, whereupon the states have regulatory authority pursuant to the Federal Power Act, there is no constitutional problem. However, if the state attempted to regulate wholesale power transactions, interstate power sales, or transmission of power, all of which are reserved to federal authority pursuant to the Federal Power Act, that state regulation could be suspect. Moreover, a state cannot regulate wholesale power and then devote the proceeds to only in-state businesses.[269]

3. U.S. Federal Stimulus Funds: "Follow the Money" Again

In response to economic crisis, the Obama Administration's stimulus package included a significant incentive package for the electric sector,[270] which poured $80 billion in spending and $20 billion in tax incentives into renewable energy and energy efficiency, as part of the $787 billion stimulus plan. This included $12.35 billion for energy efficiency improvements through low-income weatherization, state block grants, public and Section 8 housing efficiency, and Department of Defense efficiency.[271] There is a thirty percent investment tax credit for advanced energy manufacturing, a thirty percent advanced energy facilities tax credit which applies to transmission and grid-related new equipment, and $1.6 billion of clean renewable energy bonds (CREBs), first created by the Energy Policy Act of 2005.[272] The renewable energy Section 45 production tax credit was extended through 2012 or 2013 for different renewable technologies, or the option to take a grant from the Treasury that mirrors the tax credit.

The Department of Energy in 2009 awarded more than $155 million in stimulus funds to forty-one industrial efficiency projects, including district energy systems and combined

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[266] *See supra*, Part II.A.2.

[267] *See* Kirsten Engel, *The Dormant Commerce Clause Threat to Market-Based Environmental Regulation: The Case of Electricity Deregulation*, 26 ECOLOGY L.Q. 243, 295 (1999) (explaining the possible desire for states to retain system benefits charge funds within the state).

[268] *See infra* Part II.A.2.

[269] See West Lynn Creamery v. Healy, 512 U.S. 186, 211 (1994).

[270] American Recovery and Reinvestment Act of 2009, Pub. L. No. 111 5, 123 Stat. 138 (2009).

[271] David M. Herszenhorn, *A Smaller, Faster Stimulus Plan, but Still with a Lot of Money,* N.Y. TIMES, Feb. 14, 2009, http://www.nytimes.com/2009/02/14/us/politics/14stimintro.ready.html?_r=1.

[272] *See* Envtl. Prot. Agency, *Federal Incentives for Developing Combined Heat and Power Projects*, EPA.GOV (Mar. 15, 2012), http://www.epa.gov/chp/incentives/index.html.

heat and power facilities.[273] By the end of 2010, the Treasury dispensed $5.53 billion in Section 1603 cash grants to 1,387 renewable project developer, principally denominated by wind project developers ($4.7 billion of the total for wind as well as $415 million each for solar and for geothermal, landfill gas, hydroelectric, biomass, and fuel cell), with another $9 billion of project eligibility in the pipeline.[274]

As of August 2011, renewable developers had received $28.5 billion in grants and loan guarantees from the Obama Administration.[275] About a quarter of this amount flows through the U.S. Treasury Section 1603 grant program.[276] The remainder is commitments through the Section 1705 loan guarantee program for thirty-two projects.[277] There was $6 billion for a loan guarantee program for renewable energy projects under construction by September 2011, which would support about $60 billion of renewable loans for renewable power and transmission projects.[278] In the first half of 2010, 339 Mw of grid-connected photovoltaic (PV) power was installed.[279] In August 2010 to fund other programs, Congress reclaimed $1.5 billion from the Department of Energy Solar Loan Guarantee Program, which would have been "leveraged" for a larger amount of PV financing.

Tax credits for renewable power were embedded in the tax code. In the United States, the Production Tax Credit (PTC) in Section 45 of the Internal Revenue Code remains the cornerstone of federal policies supporting renewable energy.[280] The PTC was originally enacted as part of the Energy Policy Act of 1992 and has been periodically extended, with each extension lasting only for a limited period.[281] Qualified facilities are wind, closed-loop biomass, open-loop biomass,

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[273] Press Release, Dep't of Energy, DOE Awards $155 Million to 41 Industrial Energy Efficiency Projects (Nov. 4, 2009), *available at* http://www1.eere.energy.gov/solar/news_detail.html?news_id=15600.

[274] Jeffrey Ryser, *Solar Developers Seek Two-Year Extension of Cash Grant Program for New Projects*, ELECTRIC UTIL. WK., Nov. 22, 2010, at 9, 10; Jeffrey Ryser, *Cash Grant Program for Renewable Projects Could Leave Government Owing $9 Billion*, ELECTRIC UTIL. WK., Dec. 13, 2010, at 3.

[275] Jeffrey Ryser, *Cash, Loan Guarantee Programs for Renewable Development Now Total up to $28.5 Billion*, ELECTRIC UTIL. WK., Aug. 8, 2011, at 3.

[276] *Id*.

[277] *Id*.

[278] PAUL SCHWABE ET AL., NAT'L RENEWABLE ENERGY LAB., TECHNICAL REP. NO. NREL/TP-6A1-44930, RENEWABLE ENERGY PROJECT FINANCING: IMPACTS OF THE FINANCIAL CRISIS AND FEDERAL LEGISLATION (2009), *available at* http://www.nrel.gov/docs/fy09osti/44930.pdf; *U.S. Department of Energy – Loan Guarantee Program*, DSIRE, *supra* note 4 (May 8, 2012), http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US48F&re=1&ee=1.

[279] Jeffrey Ryser, *U.S. Solar Installations Head for Record Year Thanks to Lower Costs and '1603' Grants*, ELECTRIC UTIL. WK., Oct. 18, 2010, at 23, 24.

[280] I.R.C. § 45 (West 2010).

[281] The Tax Relief and Health Care Act of 2006 extended the PTC to qualified facilities placed in service before January 1, 2009. Tax Relief and Health Care Act of 2006, Pub. L. No. 109-432, 120 Stat. 2922 (2006) (codified as amended in scattered sections of I.R.C.).

geothermal, small irrigation power, municipal solid waste, and qualified hydropower facilities.[282] These are set forth in Table 4.

In 2006 the amount of the credit was 1.9 cents per kWh for wind, closed-loop biomass, geothermal and solar[283] energy facilities; 1.0 cent per kWh for open-loop biomass, small irrigation power, landfill gas, trash combustion, and qualified hydropower facilities.[284] The PTC applies for ten years for wind and closed-loop biomass and open-loop biomass built after August 8, 2005, and five years for other qualified facilities following the date the qualified facility was originally placed in service.

As part of the Obama Administration's stimulus package,[285] the tax credit was maintained at $0.021/ kWh for wind, geothermal, and closed-loop biomass, and at $.01/ kWh for all other renewable projects. Certain developers who otherwise could obtain this credit were allowed to elect an investment tax credit on tangible property instead, subject to some qualifications. This essentially provides a cash payment instead of tax credits and is subject to five-year recapture rules. A taxpayer may make an irrevocable election to have certain qualified facilities placed in service in 2009 through 2013 (2012 for wind facilities) be treated as energy property eligible for a thirty percent investment credit under Section 48. These credits for renewable technologies are summarized in Table 5.

Congress in December 2010 enacted a law that extended several expiring renewable energy and fuel tax incentives and includes some new incentives.[286] The Act extends the § 1603 grant in lieu of tax credits. The § 1603 program provides cash grants worth up to thirty percent of eligible costs of renewable energy projects. Qualifying renewable energy projects receive cash payments from the U.S. Department of Treasury in lieu of the traditional energy-related production and investment tax credits under §§ 45 and 48 of the Internal Revenue Code. Qualifying projects include wind turbines, certain biomass facilities, geothermal facilities, landfill gas facilities, certain trash facilities, certain hydropower facilities, solar facilities, fuel cells, cogeneration facilities under fifty Mw, gas micro-turbines, and geothermal heat pumps, as set forth in Table 6.

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[282] The PTC also applies to Refined Coal. *See* I.R.C. § 45(c)(7), (d)(8), (e)(8) (2006 & Supp. IV 2011).

[283] Section 710 of The American Jobs Creation Act of 2004 extended the PTC to open–loop biomass, geothermal energy, solar energy, small irrigation power, and municipal solid waste facilities. American Jobs Creation Act of 2004, Pub. L. No. 108-357, 118 Stat. 1552 (2004) (codified as amended at I.R.C. § 45). The Energy Policy Act of 2005 extended the PTC to facilities placed in service before January 1, 2008, but the in-service date for solar energy facilities was not extended, and remains January 1, 2006. Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (2005) (codified as amended in scattered sections of 42 U.S.C.).

[284] U.S. Internal Revenue Bulletin No. 2006-51, *available at* 2006 WLNR 11943068.

[285] American Recovery and Reinvestment Act of 2009, § 1302, I.R.C. § 48 (Supp. III 2010).

[286] Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010, Pub. L. No. 111-312 124 Stat. 3310 (2010).

Table 6: Renewable Energy Tax Credits Amounts and Eligibility Dates

Energy Property	Termination Date	Credit Amount
Large Wind	Jan. 1, 2012	30%
Closed-Loop Biomass Facility	Jan 1, 2014	30%
Open-loop Biomass Facility	Jan 1, 2014	30%
Geothermal (under IRC sec. 45)	Jan. 1, 2014	30%
Landfill Gas Facility	Jan. 1, 2014	30%
Trash Facility	Jan. 1, 2014	30%
Qualified Hydropower Facility	Jan. 1, 2014	30%
Marine & Hydrokinetic	Jan. 1, 2014	30%
Solar	Jan. 1, 2017	30%
Geothermal (under IRC sec.48)	Jan. 1, 2017	10%
Fuel Cells	Jan. 1, 2017	30%
Micro-turbines	Jan. 1, 2017	10%
Combined Heat & Power	Jan. 1, 2017	10%
Small Wind	Jan. 1, 2017	30%
Geothermal Heat Pumps	Jan. 1, 2017	10%

Property will qualify if it is placed in service in 2011 or if construction begins before 2012 and the project is placed in service before the applicable credit termination date (January 1, 2013 for large wind projects, January 1, 2014 for biomass, trash, marine and certain other facilities, or January 1, 2017 for solar, geothermal, fuel cells, micro-turbines, combined heat and power, small wind, and geothermal heat pump facilities). In 2009, about sixty-five percent of the projects elected the § 1603 refundable cash grant in lieu of the production tax credit, while in 2010 the percentage so electing rose to eighty-five percent.[287]

The U.S. Treasury Department "begin construction" requirement for qualifying for the thirty percent American Recovery and Reinvestment Act (ARRA) cash grant, under the original legislation, provided that a project either must be placed in service in 2009 or 2010 (since extended by one year by amendment) or, if construction begins within these deadlines, must be placed in service by the end of 2012 for large wind projects, 2013 for biomass, certain geothermal and other projects, and 2016 for solar and other projects. Treasury Department guidance specified that the beginning of construction could be satisfied either by beginning "physical work of a significant nature" or paying or incurring at least five percent of the total cost of the specified energy property (the "five-percent safe harbor").

[287] Jeffrey Ryser, *Cash Grant Program for Renewable Projects Could Leave Government Owing $9 Billion* ELECTRIC UTIL. WK., Dec. 13, 2010, at 3.

Both Clean Renewable Energy Bonds (CREBs) and New Clean Renewable Energy Bonds ("New CREBs") are types of tax credit bonds that can be used to finance certain facilities that produce electricity from certain renewable resources. CREBs are subject to a national volume cap of $1.2 billion[288] and had to be issued by December 31, 2009.[289] A taxpayer holding a CREB on a credit allowance date is entitled to a credit against its federal income taxes. In 2008, the Internal Revenue Service announced 312 additional projects selected to be financed with tax-credit bonds under the CREB program.

New CREBs are subject to a national volume cap of $2.4 billion.[290] The annual credit with respect to a New CREB is equal to seventy percent of the credit that the Treasury Secretary determines would allow the New CREB to be issued at par and without interest.[291] The tax credit to a holder of a New CREB is treated as interest that is includible in the holder's gross income, and any interest paid on a New CREB is taxable.[292]

There is accelerated depreciation for certain projects. The Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 Act extends and temporarily increases bonus depreciation for investment in certain energy equipment.[293] For qualifying property that is acquired and placed in service after September 8, 2010, and before January 1, 2012, the Act provides for 100% bonus depreciation; or if placed in service in 2012, there is 50% bonus depreciation (property generally must have a recovery period of twenty years or less). The Act also allows taxpayers to elect to accelerate certain alternative minimum tax credits in lieu of bonus depreciation for taxable years 2011 and 2012.

The depreciation provision for non-fossil fuel electric projects is illustrated in Table 7. A comparison of the value of federal tax credits is compared apples-to-apples in Table 8.[294] Despite the importance of the PTC, renewable power additionally is providing incentives in certain states by other significant incentives.[295]

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[288] STEVEN MAGUIRE, TAX CREDIT BONDS: A BRIEF EXPLANATION (2008), *available at* http://assets.opencrs.com/rpts/RL34629_20080820.pdf.

[289] Claire Kreycik & Jason Coughlin, *Financing Public Sector Projects with Clean Renewable Energy Bonds (CREBs),* NREL ENERGY ANALYSIS, (Dec. 2009), *available at* http://www.nrel.gov/docs/fy10osti/46605.pdf.

[290] *Id.*

[291] *Id.*

[292] *Id.*

[293] Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 § 401, Pub. L. No. 111-312, 124 Stat. 3210 (2010).

[294] *See also* JOINT COMM. ON TAXATION, U.S. CONGRESS, PRESENT LAW ENERGY-RELATED TAX PROVISIONS AND PROPOSED MODIFICATIONS CONTAINED IN THE PRESIDENT'S FISCAL YEAR 2011 BUDGET, at 3 (2010), *available at* https://www.jct.gov/publications.html?func=startdown&id=3678.

[295] According to the Department of Energy Funded Database of State Incentives for Renewables & Efficiency (DSIRE), twenty-six states offer some type of solar energy tax incentive with over fifty-one different types of

Table 4: Summary of Credit for Electricity Produced From Certain Renewable Resources

Eligible electricity production activity (sec. 45)1	Credit amount for 2010[2] (cents per kilowatt-hour)	Expiration[3]
Wind	2.2	December 31, 2012
Closed-loop biomass	2.2	December 31, 2013
Open-loop biomass (including agricultural livestock waste nutrient facilities)	1.1	December 31, 2013
Geothermal	2.2	December 31, 2013
Solar (pre-2006 facilities only)	2.2	December 31, 2005
Small irrigation power	1.1	December 31, 2013
Municipal solid waste (including landfill gas facilities and trash combustion facilities)	1.1	December 31, 2013
Qualified hydropower	1.1	December 31, 2013
Marine and hydrokinetic	1.1	December 31, 2013

[1] Except where otherwise provided, all section references are to the Internal Revenue Code of 1986, as amended.

[2] In general, the credit is available for electricity produced during the first 10 years after a facility has been placed in service.

[3] Expires for property placed in service after this date.

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programs. Overall there are 228 different types of rebates available in the states for renewable energy. *See* Rusty Haynes, State Solar Policy Current Status and Future Outlook, Presentation at Solar America Cities Annual Meeting (April 15, 2008), *available at* http://api.ning.com/files/1YF4B3g-6mfrZr1o7LywgF1ukJTsLq*VEi4OQOfOkdqMCPFDaaGD5sumpGbsnn8mdcmFDwG5b7dorgN*TXTdJzMdSGlEK6f*/DSIREHaynesStateSolarPolicyCurrentStatusAndFutureOutlookMarch2008.pdf.

Table 5: Summary of Investment Tax Credit Energy Production Incentives

		Credit rate	Maximum credit	Expiration
Energy credit (sec. 48)	Equipment to produce a geothermal deposit	10%	none	None
	Equipment to use ground or ground water for heating or cooling	10%	none	December 31, 2016
	Microturbine property (< 2 Mw electrical generation power plants of >26% efficiency)	10%	$200 per Kw of capacity	December 31, 2016
	Combined heat and power property (simultaneous production of electrical/mechanical power and useful heat > 60% efficiency)	10%	none	December 31, 2016
	Solar electric or solar hot water property	30% (10% after December 31, 2016)	none	None
	Fuel cell property (generates electricity through electrochemical process)	30%	$1,500 for each 1/2 Kw of capacity	December 31, 2016
	Small (<100 Kw capacity) wind electrical generation property	30%	none	December 31, 2016

Table 7: Summary of Non-Fossil Fuel Capital Cost Recovery Provisions

Eligible Activity	Description of Provision	Expiration
Five-year cost recovery for certain energy property (§ 168(e)(3)(B)(vi))	• A five-year MACRS recovery period is generally provided for equipment using solar and wind energy to generate electricity, to heat or cool (or provide hot water for use in) a structure, or to provide solar process heat; equipment using solar energy to illuminate the inside of a structure using fiber-optic distributed sunlight; equipment used to produce, distribute, or use energy derived from a geothermal deposit; and qualified fuel cell property. • A five-year MACRS recovery period is provided for certain biomass property, including (i) a boiler, the primary fuel for which will be an alternate substance; (ii) a burner (including necessary on-site equipment to bring the alternate substance to the burner) for a combustor other than a boiler if the primary fuel for such burner will be an alternate substance; (iii) equipment for converting an alternate substance into a qualified fuel; and (iv) certain pollution control equipment.	For five-year recovery period for certain solar equipment - December 31, 2016
Special allowance for cellulosic biofuel plant property (§ 168(l))	An additional first-year depreciation deduction equal to 50 percent of the adjusted basis of qualified cellulosic biofuel plant property.	December 31, 2012
Pollution control facilities (§§ 169, 291)	A taxpayer may elect to recover the cost of any certified pollution control facility over a period of 60 months. A corporation taxpayer must reduce the amount of basis otherwise eligible for the 60-month recovery by 20 percent.	None
Energy efficient commercial buildings deduction (§ 179D)	A taxpayer may take an additional deduction of $1.80 per square foot of commercial property that exceeds certain energy efficiency standards	December 31, 2013

Table 8: Comparison of Selected Energy Production Tax Credits[296]

	(1) Statutory credit amount	(2) Credit amount in dollars per MMBtus of heat energy	(3) Credit amount in dollars per MMBtus of displaced heat energy of fossil fuel feedstock
Wind power	2.2 cents per kilowatt-hour	$6.45	$2.23
Geothermal power	2.2 cents per kilowatt-hour	$6.45	$2.23
Open-loop biomass	1.1 cents per kilowatt-hour	$3.23	$1.12
Advanced nuclear power	1.8 cents per kilowatt-hour	$5.28	$1.82
Ethanol	45 cents per gallon	$5.92	$5.92
Biodiesel	$1 per gallon (expired 12/31/09)	$8.45	$8.45

[296] *See* U.S. Energy Info. Admin., Annual Energy Outlook, EIA.GOV, http://www.eia.gov/forecasts/aeo/ (last visited July 24, 2012).

III. LEGAL/TECHNOLOGICAL CHALLENGES: COST-EFFECTIVELY REACHING AND INTEGRATING SUSTAINABLE POWER SYSTEMS

> "[T]he integrated world electric energy grid is . . . the World Game's highest priority objective."
>
> R. Buckminster Fuller
> CRITICAL PATH[297]

In addition to constitutional issues confronting renewable power initiatives, there are challenges for the critical pieces that must be assembled to make renewable power work well in the American system:

- Connecting remote renewable power to consumers
- Adapting to the intermittent nature of many renewable power resources

While each of these appears to pose engineering questions, they are actually legal and regulatory issues. There is no physical inability to do each of these. However, how we do them, who pays for them, and how the system adapts, are key concerns. As important as finding the right combination of regulatory mechanisms for the renewable transition, is making those new resources function in the electric web that powers society. Let us consider each.

A. Connecting the Dots

There is a "chicken and egg" problem as to whether remote renewable generation will be created without transmission infrastructure built to it, or vice-versa. There are pressures to require the public to pay or subsidize some of these costs. While there can be extended controversy in siting transmission infrastructure, again, these are regulatory and legal disputes, not technical matters. The issues of transmission infrastructure have been present before when U.S. utilities after World War II chose to construct large baseload facilities often located a distance from load centers.[298] Large transmission infrastructure had to be created to move this power. However, from technical and legal perspectives, this poses new challenges for the existing power grid.

While renewable resources are distributed across the United States and the world, they are not distributed evenly. Nine states east of the Mississippi River do not have any

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[297] R. BUCKMINSTER FULLER, CRITICAL PATH 206 (1981).
[298] *See* 1 FERREY, *supra* note 43 § 2:11.

sub-regions with very high wind resources.[299] Six states from Virginia to Massachusetts do not have any sub-regions with at least one-quarter billion metric tons of currently available biomass annually.[300] These northeastern regions of the United States have relatively dense populations and significant electricity demand. While they have access to renewable resources, those renewable resources are not as concentrated as in other areas of the country. The new sources of renewable power are not going to be located where the traditional sources of centralized power have been located.[301] Transmission infrastructure must be constructed to bring renewable power from the generation source to the load center. However, with many buildings, there also is always the potential of tapping on-site energy efficiency as a substitute for additional generation capacity.[302]

And here is the legal issue: Transmission involving multiple states and interstate activities is regarded as subject to federal, rather than state, jurisdiction: "Federal regulation of interstate power transmission may be proper because of the interstate nature of the generation and supply of electric power."[303] In two California decisions, FERC refused California's request to specify that facilities interconnected at the distribution level involving lower voltage, rather than the transmission level at higher voltage, are beyond FERC's authority.[304] Instead, FERC reaffirmed that FERC has "exclusive jurisdiction."[305] FERC affirmed that location geographically or on the transmission system was not legally relevant, only the nature of the wholesale sale.[306] Federal jurisdiction controls interconnection to the transmission and the distribution system.[307]

As FERC has already recognized, its rules do not precisely fit location-constrained resources, like wind- and solar-based generation sources, that have an immobile energy source, are often small in size relative to the necessary interconnection facilities, tend to come online incrementally over time, and are often remotely located from consumer loads.[308] Location-constrained resources therefore have a limited ability

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[299] CHARLES F. KUTSCHER ET AL., TACKLING CLIMATE CHANGE IN THE U.S.: POTENTIAL CARBON EMISSION REDUCTIONS FROM ENERGY EFFICIENCY AND RENEWABLE ENERGY BY 2030, at 22 (2007).

[300] *Id.*at 25. These resources count agricultural residues, crops, animal manure, wood residues, municipal discarded materials and methane from landfill, as well as dedicated crop biomass. With the exception of Florida, the eastern half of the United States is devoid of sub-regions capable of producing 6.0 kwh/m^2/day with solar photovoltaic resources on south-facing structures and surfaces.

[301] Many renewable power resources, such as wind power, are located far from the load for power. *See* 1 FERREY, *supra* note 43 § 2:11.

[302] MARILYN A. BROWN ET AL., TOWARDS A CLIMATE-FRIENDLY BUILT ENVIRONMENT 57 (2005), *available at* http://www.c2es.org/docUploads/Buildings_FINAL.pdf.

[303] FERC v. Mississippi, 456 U.S. 742, 749–50, 753–57 (1982).

[304] Cal. Pub. Util. Comm'n, 132 F.E.R.C. ¶ 61,047 (2010).

[305] *Id.* (citing Fed. Power Comm'n v. S. Cal. Edison Co., 376 U.S. 205 (1964)).

[306] *Id.*

[307] S. Cal. Edison Co. v. Pub. Util. Comm'n, 101 Cal. App. 4th 384, 389–90 (Cal. Ct. App. 2002).

[308] *See* Cal. Indep. Sys. Operator Corp., 119 F.E.R.C. ¶ 61061 (Apr. 19, 2007).

to minimize their interconnection costs, and, moreover, these factors can in certain circumstances impede the development of such resources altogether.[309] As the Commission implicitly recognized, a transmission solution is necessary to efficiently bring these renewable, location-constrained resources onto the grid in accord with public policy initiatives.[310]

The Joint Coordinated System Plan, representing several independent system operators and reliability councils in the U.S., found that achieving 5 percent wind generation by 2024 would require approximately 10,000 miles of additional high-voltage transmission lines at an estimated cost of $50 billion; achieving 20 percent wind generation would require 15,000 miles of transmission lines costing approximately $80 billion.[311] The federal push for National Interest Energy Transmission Corridors (NIETCs) under the Energy Policy Act of 2005[312] was criticized as environmentally sensitive areas into energy corridors and criticized as running a giant extension cord to existing coal sources. Multiple suits for failure to adequately assess GHG impacts involving the National Environmental Policy Act (NEPA) were filed by environmental groups, including the Natural Resources Defense Council (NRDC) on this and past actions,[313] and Endangered Species Act challenges regarding failure to assess GHG impacts could follow.[314] As long as the state took some action, including a denial of the permit, this did not invoke FERC's ability to intercede.

Traditionally, both FERC and state regulators assigned only costs that were "just and reasonable" to those who would benefit from the utility investment.[315] Because moving electrons follow law of electro-physics and not "contract paths,"[316] determining those benefited is harder with many more, smaller and more diverse renewable and distributed generation sources. The Wall Street Journal, in an editorial, accused FERC of trying to "socializ[e] transmissions costs nationwide" in a manner that is "insidious, and arguably unconstitutional."[317] A bipartisan group of U.S. senators similarly was

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[309] *Id*. at 64.

[310] Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities, 131 F.E.R.C. ¶ 61253 (2010).

[311] William F. Henze II, *Electricity: If We Want It Clean, Firm, and Cheap, We're Going to Have to Pick Two*, ELECTRICITY J., Nov. 2009, at 81.

[312] 16 U.S.C. § 824 (2006)

[313] Border Power Working Grp. v. U.S. Dep't of Energy, 260 F. Supp. 2d 997 (S.D. Cal 2003); Mid–States Coalitions for Progress v. Surface Transp. Bd., 345 F.3d 520 (8th Cir. 2003); Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 538 F.3d 1172 (9th Cir. 2008).

[314] *See, e.g.*, *Piedmont Envtl. Council v. FERC* 558 F.3d 304 (4th Cir. 2009); *Pac. Coast Fed'n. of Fishermen's Ass'ns v. Gutierrez,* No. 06-00245, 2008 U.S. Dist. Lexis 31462 (E.D. Cal. Apr. 16, 2008); *Natural Res. Def. Council v. Kempthorne,* 506 F. Supp. 2d 322 (E.D. Cal. 2007).

[315] *Is FERC Really 'Socializing' Transmission Costs?*, ELECTRICITY J., Mar. 2011, at 1, 5.

[316] *Id*.

[317] *The Midwest Wind Surtax*, WALL ST. J., Dec. 30, 2010, at A14.

concerned that FERC's proposed rulemaking on transmission planning,[318] and two recent decisions involving the Midwest[319] and the Southwest[320] ISOs allocated the costs to all ratepayers even where the transmission line did not serve those ratepayers.[321] The Chair of FERC sought to reassure the Congress and public that FERC would only make those who benefited from transmission lines incur their costs.[322]

An increase in use of renewable energy will require new transmission corridors and capacity to transport that power from the generation site to load centers. Who pays for this expensive transmission infrastructure is at issue.[323] Transmission cost allocation is a policy choice between whether transmission is seen as a private or a public good.[324]

Texas allows cost recovery through rate base for transmission connections within Competitive Renewable Energy Zones.[325] Texas utilities spent ratepayer funds to bring Texas competitive renewable energy resources to market.[326] A federal circuit court struck a FERC order that would require all regional transmission organization members to equally share costs for any large transmission lines, whether or not they benefited from the investment.[327] The decision held that local utilities should not have to pay for transmission lines to transport power outside the region, thereby avoiding widely socializing costs to all ratepayers, rather than to those that benefited.

California offers special cost sharing for transmission in "locationally constrained areas."[328] According to the report to the California Power Utilities Commission, it is estimated that causing Californians to obtain thirty-three percent of their power from renewable resources by 2020 would cost an expenditure of roughly $115 billion in new

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[318] Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities, 131 F.E.R.C. ¶ 61253 (2010).

[319] Midwest Indep. Transmission Sys. Operator, Inc., 137 F.E.R.C. ¶ 61074 (2011).

[320] Sw. Power Pool, Inc., 131 FERC ¶ 61252 (2010).

[321] Esther Whieldon & Jason Fordney, *"How Much More Can I Reassure People?" FERC Chief Asks, Challenged on Allocation*, ELECTRIC UTIL. WK., Mar. 7, 2011, at 1, 36–37.

[322] *Id*.

[323] David Bloom et al., *Current Conflicts in U.S. Electric Transmission Planning, Cost Allocation and Renewable Energy Policies: More Heat Than Light?,* ELECTRICITY J., Dec. 2010, at 8, 9.

[324] Adrienne Ohler & Kristi Radusewicz, *Indirect Impacts in Illinois from a Renewable Portfolio Standard*, ELECTRICITY J., 65, 72 (Aug. 2010).

[325] *See* Alborz Nowamooz, *Inadequacy of Transmission Lines: A Major Barrier to the Development of Renewable Energy*, 3 ENVTL. & ENERGY L. & POL'Y J. 176, 179 (2008) (discussing Texas plan).

[326] Adesoji Adelaja et al., *Effects of Renewable Energy Policies on Wind Industry Development in the U.S.*, 2 J. NAT. RESOURCES POL'Y RES. 245, 245–62 (2010).

[327] Ill. Commerce Comm'n v. FERC, 576 F.3d 470, 476–78 (7th Cir. 2009).

[328] *See* CAL. INDEPENDENT SYS. OPERATOR CORP., 2008 SUMMER LOADS AND RESOURCES OPERATIONS PREPAREDNESS ASSESSMENT 9 (2008) (noting connection of remote resources).

infrastructure.[329] The Arizona Corporation Commission rejected Southern California Edison's proposal to build a 230-mile line to provide Southern California with access to cheaper Arizona power, fearing that the exported power would increase costs to Arizona consumers who enjoyed the benefits of cheap existing plant output.[330]

There is a plan for construction of additional wind power resources in remote areas of Northern Maine and in Canada, where there is a robust wind regime and where there is sparse population settlement, and therefore little resistance to the siting of power generation resources.[331] Massachusetts regulators have shown skepticism about paying for new interconnections and power lines to Maine that would allow transport of wind power south to load centers.[332] The Maine public advocate opposed the new transmission line from Maine to load centers in southern New England states.[333] Traditionally, the interconnection from generators to the existing transmission lines has been the responsibility of the generator to construct. Maine utilities also have requested adders to their base return on equity for transmission facilities to move new renewable power from northern Maine.[334]

So, the smart grid rollout is not proceeding briskly everywhere but is encountering some legal impediments and barriers. It is not proving easy to connect the dots.

B. Intermittency of Renewable Power

Renewable power introduces an unparalleled degree of intermittency of power supply to the modern grid. A study released in 2008 by Cambridge Energy Research Associates found that the production patterns of wind farms "do not correlate well with peak summer demand," and "capacity provided by wind projects is typically valued at ten to twenty percent of their maximum rated capacity."[335] To keep the grid in balance and operational with this new intermittency, there must be the proper mix of new resources

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[329] Lisa Weinzimer, *Let's Level with Ratepayers About High Costs of Renewables, California Regulator Says,* ELECTRIC UTIL. WK., Nov. 16, 2009, at 25.

[330] Press Release, Ariz. Corporate Comm'n, Regulators Reject "Extension Cord for California" Commissioners Reject Palo Verde to Devers II Power Line, (May 30, 2007) *available at* https://www.azcc.gov/divisions/administration/news/Devers_II_Vote.pdf.

[331] *See* Beth Quimby, *Two Billion Power Grid Upgrade Proposed*, ME. SUNDAY TELEGRAM, Aug. 3, 2008, at A1 (reporting Maine wind farming project).

[332] Jason Fordney & Lisa Wood, *Northeast Transmission Projects Embody Arguments About Who Should Pay for What*, ELECTRIC UTIL. WK., Aug. 18, 2008, at 7.

[333] Lisa Wood, *Solar Company Proposes Unique Project to Displace Need for 350 MW Maine Line*, ELECTRIC UTIL. WK., Feb. 2, 2009, at 10–11.

[334] *See* Cent. Me. Power Co., 35 FERC ¶ 61236 (2011).

[335] Jeffrey Ryser, *With Wind Power at Their Back, 13,000 at Conference Weigh Pros, Cons*, ELECTRIC UTIL. WK., June 9, 2008, at 1, 32.

not only for primary production of power, but of additional new resources to fill in during the more constant intermittency of a system more dependent on non-firm renewable resources.

A slight mismatch in the supply and demand of electric power in California caused brownouts, billions of dollars of extra expense to consumers, and the recall of the governor.[336] On February 26, 2008, the Electric Reliability Council of Texas (ERCOT) grid operator in Texas was unable to compensate with sufficient backup power resources when there was an unexpected drop in wind power production by more than eigty percent.[337] Texas officials ordered another investigation of the rolling blackouts that affected the state's electric grid in 2010 and 2011.[338] Getting this right has major repercussions going forward.

Mainstay supplies of renewable power in the near and intermediate term are wind power and solar power, which both are intermittent in nature, and supply power a third or fewer of the hours of a day, and not controllable as to when there will be precise amounts of power.[339] There is concern among the North American Electric Reliability Organization (NERC), which is responsible for managing the reliability of the North American utility grid, that the RPS standards in half the states and four Canadian provinces could cause early substitution that decreases grid reliability.[340]

Additional intermittent resources as part of the baseload power supply will require baseload fossil-fired units to cycle more, adding significantly to operating cost and shortening the life of the fossil units.[341] Coal-fired plants have been designed to operate at more than fifty percent of their capacity to serve slow-changing loads. Coal-fired units use a less dense fossil fuel and must operate at forty-five to fifty percent of their design capacities.[342] If coal plants are forced to cycle on and off more, it will result in significantly higher operation and maintenance expenses, increased heat rate, which is a

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[336] Steven Ferrey, *Soft Paths, Hard Choices: Environmental Lessons in the Aftermath of California's Electric Deregulation Debacle*, 23 VA. ENVTL. L.J. 251 (2004).

[337] *How Renewables Can Be Undermined by Intermittency*, ELECTRICITY J., June 2008, at 5.

[338] Rebecca Smith, *Texas to Probe Rolling Blackouts*, WALL ST. J., Feb. 7, 2011, http://online.wsj.com/article/SB10001424052748703989504576128493806692106.html.

[339] For a discussion of intermittent renewable wind and solar power deviation of supply see 1 FERREY, *supra* note 43 § 2:11 (2012). For a discussion of the percentage of wind and solar resources, see WYSER & BARBOSE, *supra* note 52, at 1.

[340] *Public Utilities Fear that GHG Cuts Might Threaten Electricity Supply, Reliability*, 2 CARBON CONTROL NEWS 30 (2008).

[341] J. Nicolas Puga, *The Importance of Combined Cycle Generation Plants in Integrating Large Levels of Wind Power Generation*, ELECTRICITY J., Aug.–Sept. 2010, at 33.

[342] *Id*.

proxy for inefficiency, increased start-up costs and a shorter life of the unit.[343] They cannot quickly vary to follow changing amounts of wind or PV generation.

According to some literature, intermittent renewable resources require inefficient gas turbines to operate at part load to be available for more gaps.[344] Even at current wind penetration levels in a grid (around three percent nationally as of 2010[345]), there could be a thirty-three to fifty percent decline in the running of gas-fired combined cycle fossil-fuel generation units, and it is unclear whether these units could run profitably at these levels or would exit the power-supply market.[346] Even though more able to cycle up and down than coal plants, natural gas combined cycle turbine facilities, which can be modified to increase by up to fifty percent their start-up times to accommodate pressure and temperature transients of their steam turbines and readiness of their heat recovery steam generators, this flexibility still may not be able to completely follow the intermittency of greater renewable power in the grid.[347] Even able to be adapted to do so, these gas combined cycle units will experience higher heat rates, less efficient operation, greater maintenance, and unavailability.[348]

While the more modern coal plants have the ability to ramp up and down more flexibly than older units, they do not have the flexibility to match the real-time variability to match fluctuations in intermittent renewable power availability to keep the grid constantly balanced.[349] European data illustrates that, since the regulation of CO_2 emissions, there has been a shift from traditional coal unit operation to more operation of gas combined cycle units.[350] This has resulted in an increase in these units' operation and maintenance costs, outages, and unavailability.[351]

It will be necessary to design new ancillary service products that include the utilization of more spinning and non-spinning reserves to compensate for wind

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[343] *Id*.
[344] *Id*.
[345] RYAN WISER ET AL., U.S. DEP'T OF ENERGY, 2010 WIND TECHNOLOGIES MARKET REPORT iii (2011), available at http://www1.eere.energy.gov/wind/pdfs/51783.pdf.
[346] Puga, *supra* note 341, at 33–34.
[347] *Id*.
[348] *Id*.
[349] *Id*.
[350] W. Edward Platt & Richard B. Jones, *The Impact of Carbon Trading on Performance: What Europe's Experience Can Teach North American Generators*, POWER MAG., Jan. 1, 2010, http://www.powermag.com/gas/The-Impact-of-Carbon-Trading-on-Performance-What-Europes-Experience-Can-Teach-North-American-Generators_2359.html.
[351] *Id*.

generation fluctuations.[352] It has been recommended that utilities acquire more quick-start and quick-ramp peaking power generation resources.[353]

Unless there are advancements in power-storage technology from what is now available, this increased share for intermittent resources will reduce the reliability of the power grid as a system.[354] The U.S. Department of Energy calculated that approximately 20 percent intermittent power could be accommodated on the grid, about the amount of back-up reserve margin in regional power systems, without requiring additional storage or other mechanisms to accommodate intermittency.[355] FERC's Director of Reliability indicated that regional data in 2011 did not indicate such accommodation capability: "We concluded we can dot three percent in the West, we can do one percent in the East and we can do ten percent in Texas."[356] FERC initiated a notice of proposed rulemaking to assist intermittent renewable resources to mitigate their impacts on the grid by requiring fifteen-minute scheduling and line operators to offer ancillary services from other generators in a balancing area to renewable power generators.[357]

The electric power system must constantly—about every four seconds—balance supply with demand to keep the grid operational.[358] If power supply does not respond and is deficient to instantaneous demand, the grid can shut down and black out large areas, as in the northeast United States on August 14, 2003.[359] The New England grid control area provides an interesting example of these phenomena. In 2007, New England had about 31,052 MW of rated generating capacity to serve a peak demand of 28,127.[360] Peak demand has been growing more quickly than total electric demand during the past decade.[361] In 1980, New England peak capacity was 154% of average load and increased in 1990 to 159%, and in 2000 to 175%.[362] The peak is forecast to continue to increase

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[352] *Id*.

[353] *Id*.

[354] *See generally* FERREY, *supra* note 43, § 2.20 (for discussion of power storage technology).

[355] *Id*.

[356] Martin Coyne, *FERC Reliability Director Details Limits of FERC/NERC Process on Cybersecurity*, INSIDE FERC, June 27, 2011, at 9, *available at* 2011 WLNR 13699645.

[357] Integration of Variable Energy Resources, 133 F.E.R.C. ¶ 61149 (2010).

[358] FERREY, *supra* note 10, at 530.

[359] Matthew L. Wald, Richard Perez-Pena & Neela Banerjee, *The Blackout: What Went Wrong; Experts Asking Why Problems Spread So Far*, N.Y. TIMES, Aug. 16, 2003, at A1 (examining cause of 2003 blackout across northeastern United States).

[360] Petition at 16, *In re* Montgomery Energy Billerica Power Partners, No. E.F.S.B. 07-02 (Mass. Energy Facilities Siting Bd. Mar. 3, 2009).

[361] O. SIDDIQUI, ELEC. POWER RES. INST., ASSESSMENT OF ACHIEVABLE POTENTIAL FROM ENERGY EFFICIENCY AND DEMAND RESPONSE PROGRAMS IN THE U.S.: 2010–2030: EXECUTIVE SUMMARY 7–8 (2009).

[362] Petition at Fig. 3.3-2, *In re* Montgomery Energy Billerica Power Partners, No. E.F.S.B. 07-02 (Mass. Energy Facilities Siting Bd. Mar. 3, 2009).

over time.[363] This is a function of increasing air-conditioning usage during the summer peak days.

The need for peaking power resources in New England is established as 7,000 MW.[364] However, there is only available 1,510 MW of non-pumped storage peaking resources.[365] With pumped storage counted, there is about 3,000 MW of peak power resources.[366] This is five to ten percent of total supply, now even before the rollout of renewable resources.[367] This is more than a fifty percent deficiency between peak need and supply.[368] Moreover, these limited available peaking power resources are fossil-fueled when there is a need for dual-fuel capability; twenty percent of this peak power resource has dual fuel oil/gas capability.[369] And two thirds of the remaining eighty percent of the peaking power is generated by oil fuel only.[370] Oil is more polluting and thus more responsible for CO_2 global warming emissions per unit of power generated than is natural gas.[371] The grid operator for New England, ISO-NE, analyzing this situation concluded:

> A lack of fast-start resources in transmission-constrained subareas could require the ISO to use more costly resources to provide these necessary services. In the worst case, reliability could be degraded.[372]

What is important in an age of renewable power and carbon control is quick-start capability of the backup/peaking resources. Most of the existing backup/peaking capacity

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[363] *Id.* at Fig. 3.3-3; *see also* ISO NEW ENG. INC., FORECAST REPORT OF CAPACITY ENERGY LOADS AND TRANSMISSION, 2006-2015, at 1 (2006), *available at* http://www.iso-ne.com/trans/celt/report/2006/2006_CELT_Report.pdf.

[364] *See* Braintree Elec. Light Dep't Petition, No. E.F.S.B. 07-1/D.T.E/D.P.U. 07-5, at 77–78 (Mass. Energy Facilities Siting Bd. Feb. 29, 2008), *available at* http://www.env.state.ma.us/dpu/docs/electric/07-5/efsb07-1/22908findec.pdf [hereinafter E.F.S.B. Braintree Order].

[365] *See id.* at 78.

[366] *See In re* Montgomery Energy Billerica Power Partners, LP, No. EFSB. 07–02, 2009 WL 1532821, at *16 (Mass. Energy Facilities Sitting Bd. Mar. 3, 2009).

[367] *Id.*

[368] Petition at 3–8, 3–16, *In re* Montgomery Energy Billerica Power Partners, No. EFSB 07-02 (Mass. Energy Facilities Sitting Bd. Mar. 3, 2009).

[369] E.F.S.B. Braintree Order, *supra* note 364, at 77–78 (noting a quadrupling of dual-fuel fired backup/peaking capability is immediately needed); *see also* ISO NEW ENG. INC., REGIONAL SYSTEM PLAN 2005, at ES-2 (2005), *available at* http://www.iso-ne.com/trans/rsp/2005/05rsp.pdf.

[370] E.F.S.B. Braintree Order, *supra* note 364, at 78. Only 260 MW of peaking capacity in New England has dual-fuel capability. *See* ISO NEW ENG. INC., *supra* note 363, at 3.

[371] *See Combustion Fuels - Carbon Dioxide Emission*, ENGINEERING TOOLBOX, http://www.engineeringtoolbox.com/co2-emission-fuels-d_1085.html (last visited May 16, 2012) (showing oil emitting about fifteen percent more CO_2 than natural gas, and coal emitting more than fifty percent more CO_2 than natural gas).

[372] ISO NEW ENG. INC., 2006 REGIONAL SYSTEM PLAN 5 (2006), *available at* http://www.iso-ne.com/trans/rsp/2006/rsp06_final_public.pdf.

now installed in the grid is not the newer aero-derivative quick-start technology.[373] Quick-start allows the generator to go from a cold-start to full power production in less than ten minutes, which is the shortest category for start maintained by system operators.[374]

So, the reality today, as one attempts to transform the grid to accommodate more intermittent renewable power, is that the power-generation grid in many places is short of needed quick-start backup/peaking power resources.[375] Storage technologies are also an option.[376] Regulators must work not only on a transition in generating sources but in reconfiguring back-up generation. Again, these are regulatory, rather than merely technological, challenges.

IV. CONCLUSION

The future is not what it appeared—at least not yet. Following the money, there are major recent initiatives for renewable energy as a means to change the U.S. energy infrastructure and combat emission of GHGs. However, federal bills on energy have not passed the legislature, although the federal government has poured lots of "stimulus" money into energy.[377] This has left the states to fill the void. Looking at these new energy initiatives as they fit within U.S. law:

- They have faced successful recent constitutional challenge under the Supremacy Clause of Article VI

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[373] The bulk of fossil-fueled power generation was built prior to 1990, when aero-derivative quick-start technology began to be used for power generation. *See* ENERGY INFO. ADMIN., EXISTING GENERATION CAPACITY BY FUEL TYPE (2008), *available at* http://www.ela.doe.gov/cneaf/electricity/page/capacity/existingunitsbs2008.xls. Demand for additional generating technology has only been increasing at one to two percent annually, so new additions during the past two decades constitute a distinct minority of installed generation. *See* ISO NEW ENG. INC., *supra* note 372, at 4. Regarding the small amount of peaking or back-up generation in systems, see *In re* Montgomery Energy Billerica Power Partners, No. EFSB 07-2 (Mass. Energy Facilities Siting Bd. Mar. 3, 2009), 2009 WL 1532821, at **16, 18, 20 (Mar. 3, 2009).

[374] E.F.S.B. Braintree Order, *supra* note 364, at 78. ISO-NE has separate reserve markets for ten minute non-spinning reserve capacity and thirty minute operating reserves. *Id.* at 77. Many units have to "spin" to meet either of these criteria. *See* ISO NEW ENG. INC., *supra* note 372, at 42–43.

[375] *See* U.S. DEP'T OF ENERGY, SUPPLEMENT TO THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE GILBERTON COAL-TO-CLEAN-FUELS AND POWER PROJECT: GILBERTON, PENNSYLVANIA 3–4 (2006) (citing OFFICE OF FOSSIL ENERGY, U.S. DEP'T ENERGY, CO2 CAPTURE AND STORAGE IN GEOLOGIC FORMATIONS (2002), *available at* http://www.netl.doe.gov/technologies/carbon_seq/refshelf/CS-NCCTIwhitepaper.pdf.

[376] *See* FERREY, *supra* note 43, § 2:20.

[377] *See*, *e.g.*, American Recovery and Reinvestment Act of 2009 § 1302, I.R.C. § 48(c) (Supp. III 2010).

- They have faced successful dormant Commerce Clause challenge under Article I of the Constitution

Promoting renewable energy alternatives, several states have utilized above-market feed-in rates to mandate renewable power acquisition by utilities that pass these costs on to ratepayers who may or may not elect these power supply mixes. Such programs are excluded from their state regulatory authority under the Federal Power Act, the Filed Rate doctrine, and the Supremacy Clause of Article VI of the Constitution:

> FERC's FIT Order did not create a new policy dilemma; it simply reminded California and the states that the states' rights to establish policy concerning electric generation resource selection does not include power to impose prices under state law where sales of electricity for resale and any form of interstate transmission are involved.[378]

Moreover, when they discriminate between in-state and out-of-state power generation by location in creating RECs and other regulatory incentives, recently states have been challenged successfully under the Commerce Clause for such practices.

The fight has just begun:

- California feed-in tariffs for CHP and renewable power [379]
- California lost a suit on its carbon control mechanism for failing to evaluate alternatives to cap-and-trade regulation, resulting in an additional year of delay until 2013 [380]
- The challenge by conventional generators of New Jersey in-state energy facility preferences[381]
- Suit on renewables and RPS in Colorado[382]
- A state court ruling in 2011 ruled that the Missouri RPS program was illegal[383]

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[378] Yaffe, *supra* note 204, at 12.

[379] Cal. Pub. Util. Comm'n, 132 F.E.R.C. ¶ 61,047 (2010).

[380] Ass'n of Irritated Residents v. Cal. Air Res. Bd., No. CPF-09-509562 (Super. Ct. of Cal., Cnty. of S.F. Mar. 18, 2011) (issuing a writ of mandate enjoining CARB from any further cap-and-trade rulemaking until it has complied with CEQA by analyzing alternatives to cap-and-trade and public comments; this delayed the plan until 2013); Lisa Weinzimer & Geoffrey Craig, *Delaying California GHG Cap-and-Trade Regime a Year Draws Support from Stakeholders*, ELECTRIC UTIL. WK., July 4, 2011, at 11–12.

[381] PJM Interconnection, L.L.C., 135 F.E.R.C. ¶ 61,022 (2011).

[382] Complaint at 2, Am. Tradition Inst. v. Colorado, No. 1:11-cv-00859-WJM-BNB (D. Colo. Apr. 4, 2011).

[383] Missouri *ex rel.* Mo. Energy Dev. Assoc. v. Pub. Serv. Comm'n, Nos. 10AC-CC00512, 10AC-CC00511, 10AC-CC00513, 10AC-CC00528, 10AC-CC00536 (Cole Cnty., Mo. June 29, 2011), *available at* http://www.realestatedevelopmentlawupdate.com/files/2011/08/Cole-County-Conc-of-Law-on-RPS-

- Indeck Energy's (owner of a cogeneration power facility) suit against New York regarding the constitutionality of its carbon-regulation program as part of the ten-state Regional Greenhouse Gas Initiative (RGGI)[384]
- New York's participation in RGGI, challenged a second time in 2011 as being without proper legislative approval and only implemented by regulation[385]
- A recent suit by Entergy against Vermont on regulation of its wholesale nuclear power sales[386]
- TransCanada's suit against Massachusetts on discrimination against in-state renewable energy projects[387]
- A 2010 renewable feed-in tariff for Indianapolis Power & Light was opposed by the utility, claiming this small distributed power program was being used by third-party developers of large two to ten Mw stand-alone projects who were not customers of the utility[388]

The recent state regulatory challenges in California, Massachusetts, New York, New Jersey, and Missouri appear to be just the opening shots. In terms of state policies, there are:

- Utilization of net metering by more than forty states
- Approximately thirty states with RPS programs, several of which provide in-state preferences or REC discrimination associated with power production
- Twenty-three states either regulating or having decided to regulate climate change emissions

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challenge-6-29-2011.pdf. (holding that the RPS program "takes the cash property of utilities (and their ratepayers) and transfers it to certain customers" without due process).

[384] Press Release, Indeck Energy Servs., Inc., Indeck Energy Sues State Questioning Legality of Regional Greenhouse Gas Program (Jan. 29, 2009), http://www.indeckenergy.com/pdfnews/RGGI%20Lawsuit%20012909%20.pdf.

[385] Complaint at 1, Thrun v. Cuomo (N.Y. Sup. Ct. June 27, 2011), *available at* http://static.taxcutsforall.com/files/RGGI%20complaint.pdf; Geoffrey Craig & Gail Roberts, *Lawsuit Disputes Legality of New York Participation in RGGI, Citing State's Lack of Legislative Approval*, ELECTRIC UTIL. WK., July 4, 2011, at 10.

[386] Complaint for Declaratory and Injunctive Relief, Entergy Nuclear Vermont Yankee, LLC v. Shumlin, No. 11-cv-99, 2011 WL 1459011 (D. Vt. Apr. 18, 2011).

[387] Complaint at 1, TransCanada Power Mktg. Ltd. v. Bowles, No. 4:10-cv-40070-FDS (D. Mass. Apr. 16, 2010), *available at* http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CDcQFjAB&url=http%3A%2F%2Fwww.windaction.org%2F%3Fmodule%3Duploads%26func%3Ddownload%26fileId%3D2019&ei=yn0QUKzCM-GriAKDqYBg&usg=AFQjCNGcnZjs4DVlpV0qFTMVs8BR0dVkVQ&sig2=8bELGTHM8jtvEsqtXA8A_w.

[388] Matyi, *supra* at 224.

- Almost twenty states with renewable energy trust funds

Collectively, these constitute the four corners of the foundation of renewable energy policy in the United States. To date, the piers of this foundation are coming under some constitutional attack with some success. There will be more challenges.

Policy and law do not operate in parallel, unrelated universes. In the U.S. federalist constitutional system, there are clear lines of governance and authority at different levels of government in a unified field of law. *Carte blanche* is not afforded under the Constitution to every state utility regulatory commission or environmental agency idea. It is the resolution of these legal creases—not in technology issues *per se*—that will sculpt the energy future of America as we move forward.