California Challenges & Vulnerabilities of the New Business Model Design for Power

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I. INTRODUCTION

Electricity has changed. While in terms of physics it is still the 60 Hz 120 volt AC movement of electrons in the outer orbit of copper wires, the business model has altered through state regulations and incentives with unanticipated legal repercussions. Several key states are indirectly imposing on their electric sectors a new business model that fundamentally changes the role of, and financial incentives for, utilities, consumers, and distributed power generators.

California and key RGGI East Coast states are now beginning to evaluate whether their regulation of distributed power complies with law and regulatory principles. States have lost more than a dozen recent suits against aspects of their models of climate regulation. Exactly a decade ago, at a Duke Law School forum, I was asked to forecast what would characterize the U.S. "Power Future" in which I included, inter alia:[1]

- Waning of fossil fuel power.
- Shifting to renewable energy and on-site cogeneration.
- Increasing EPA regulation of fossil fuels.
- Greater centralized importance and change of the transmission grid.
- The importance of proactively addressing climate change at the state level.
- Benefits of dispersed distributed generation.
- The importance of state renewable portfolio standards (RPS) and net metering programs, and the critical distinction for states to implement these legally.

This Article compares and contrasts state regulatory decisions, programs, subsidies, and the evolving new business model. Section II examines the revolutionary role of renewable energy, the critical role of electricity, and the changing business model. Section III analyzes how various incentives are being embedded in government programs in many states, how the incentives or the programs affect the evolving business model, how these are valued and shift economic impacts, and criticism of the results.

1. Steven Ferrey, *Power Future*, DUKE ENVTL. L. & POL'Y F. 261 (2005).

Section IV dissects the motivation for the "regulatory play" in the new business model.

II. MODEL—BEHAVIOR

A. Renewable Power Economics and Traditional Service Model Exit

A big change is ushered in through the technological and cost decline of wind and solar photovoltaic (PV) distributed generation. The cost of photovoltaic solar panels has fallen dramatically—a decline from about $1.90 per watt in 2009 to $0.70 per watt.[2] Inverter prices, for the equipment necessary to convert photovoltaic direct current to alternating current, have also declined by more than 60% in cost from $0.60 to $1.00 or more per watt in 2005 to under $0.20watt in 2013.[3] This has allowed the solar photovoltaic markets to grow at an average of more than 40% each year since 2000:[4]

> As a result of these trends, PV could act as a disruptive technology that challenges the incumbent players in its industry. Many analysts have forecasted that the centralized utility model that has served most of the world for over 100 years could give way to new business operating paradigms.[5]

Since 2008, the price of the photovoltaic panels has fallen by 75% and the pace of solar installations has increased ten times.[6] One additional rooftop solar system was being installed every four minutes in 2013 in the United States.[7] In the United States, there were more than 300,000 "distributed" solar installations installed in 2012, almost all in the 43 net

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2. Wilson Rickerson et al., *Residential Prosumers—Drivers and Policy Options (Re-Prosumer)*, INT'L ENERGY AGENCY-RETD, Sept. 2014, at 9; Jade Jones, *Regional PV Module Pricing Dynamics: What You Need to Know,* GREENTECHSOLAR (Nov. 22, 2013), http://www.greentechmedia.com/articles/read/regional-pv-module-pricing-dynamics-what-you-need-to-know.

3. *Id.*; Ian Clover, *IHS Cuts Global Inverter Market Forecast in Face of Dramatic Price Drops,* PV MAG. (Oct. 16, 2013); Navigant Consulting Inc., *A Review of PV Inverter Technology Cost and Performance Projections*, NREL/SR-620-38771, NATIONAL RENEWABLE ENERGY LABORATORY (2006).

4. *Id.* at 10.

5. *Id.* at 12.

6. Ker Than, *As Solar Power Grows, Dispute Flares Over U.S. Utility Bills,* NAT'L GEOGRAPHIC (Dec. 24, 2013), http://news.nationalgeographic.com/news/energy/2013/12/131226-utilities-dispute-net-metering-for-solar/.

7. *Id.*

metering states.[8] In 2013, two-thirds of solar installations in California were structured where the homeowner leased the panels rather than purchased them.[9]

Much of the innovation responsible for the solar industry's explosive growth has been financial rather than technological. Half the U.S.'s solar capacity, for instance, was installed just in 2012.[10] Driving those sales was the ability of homeowners to avoid the five-figure cost of a photovoltaic system. Homeowners could lease the system for monthly payments that often were lower than what they would pay their local utilities. Anywhere between 75 and 90 percent of all solar systems are now leased as a result. Regulated utilities today are generally barred from providing solar photovoltaic units behind the meter on the customers' properties to sell to their own customers. Third-party ownership of residential PV systems has been a dominant business model, with third-party ownership constituting greater than 80% in Arizona and California.[11]

The CEOs of six major U.S. utilities estimated that solar will comprise 15% to 20% of their companies' generation portfolios in 20 years. Distributed generation creates benefits for the larger energy system. Generating power on-site avoids energy loss of the transmission and distribution and can defer transmission capacity upgrade modifications and distribution costs.[12]

Grid exodus could become a viable option for residential system owners in Hawaii before 2020, in California in the early 2020s, and in New York State in the late 2020s. More southern latitudes could begin to achieve attractive internal rates of return around 2020.[13] In Hawaii, the rapid rise of distributed PV generation has already overloaded certain distribution lines resulting in restrictions on new solar PV projects.

Utilities now do not earn a profit on PV distributed generation, which others own. Some utilities propose that they be allowed to recovery through rate-base solar on customer rooftops, which very few states now permit. Certain utilities are going into solar as a separate unregulated business venture. Dominion Energy recently announced it is divesting its

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8. *Id.*
9. *Id.*
10. Rickerson, *supra* note 2.
11. GTM Research & Solar Energy Industries Assoc., "*U.S. Solar Market Insight Report: Q2 2013*," 2013, *available at* http://www.greentechmedia.com/research/ussmi.
12. Rickerson, *supra* note 3, at 44. Most countries in North America and Europe experience T&D losses of 4-8%. *Id.*
13. *Id.* at 18; Patrick Hummel, Per Lekander, Alberto Gandolfi, Stephen Hunt, & Ignacio Cossio, *The Unsubsidised Solar Revolution*, UBS INVESTMENT RESEARCH (2013).

retail business and that it plans to double down on solar with a 250 mW development target by 2016.[14]

The New York Public Service Commission (PSC) launched a regulatory proceeding to reform the state's energy industry and regulatory practices.[15]

B. The Evolving Utility Model

Many recent articles discuss the utility business model and how it is changing, and even how it must change.[16] Some people in the power industry think a transition to use decentralized micro-grids could be revolutionary.[17] There is concern that these changes could usher in new industry architecture, ultimately supplanting the centralized utility grid with a new decentralized, cellular topology.[18] Some argue that utilities may "go the way of the dinosaurs."[19] Some commenters forecast that utilities could become more like phone companies in a new era of total competition.[20] However, there are important distinctions. There will

14. Zacks Equity Research, *Dominion Multiplies Solar Projects* (Apr. 2, 2014), http://www.zacks.com/stock/news/128536/Dominion-Multiplies-Solar-Projects.

15. *See* New York P.U.C., Case 14-M-0101 Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision (REV), http://www3.dps.ny.gov/W/PSCWeb.nsf/All/26BE8A93967E604785257CC40066B91A?OpenDocument.

16. Ronald Lehr, *New Utility Business Models: Utility and Regulatory Models for the Modern Era*, 26 ELECTRICITY J., Oct. 2013 at 35–53; *Business Not as Usual: Fine-Tuning Utility Model Won't Do*, 27 ELECTRICITY J., Mar. 2014, at 4–5; Fereidoon P. Sioshansi, *Why the Time Has Arrived To Rethink The Electric Business Model*, 25 ELECTRICITY J., Aug.–Sept. 2012, at 65–74; Renewable Energy World Editors, *The Big Question: What Is the Future Utility Business Model?* RENEWABLE ENERGY WORLD (Dec. 25, 2013), http://www.renewableenergyworld.com/rea/news/article/2013/12/the-big-question-what-is-the-future-utility-business-model; John Downey, *Technology will change utility business model, Duke Energy exec says*, CHARLOTTE BUSINESS JOURNAL (July 15, 2014, 3:55 PM), http://www.bizjournals.com/charlotte/blog/energy/2014/07/technology-will-change-utility-business-model-duke.html; David Savenije, *How new market entrants are upending the utility business model: Companies like Google, NRG Energy and Tesla have 'ambitions to become a new kind of utility',* UTILITY DIVE (May 12, 2014), http://www.utilitydive.com/news/how-new-market-entrants-are-upending-the-utility-business-model/261442/; Corbin Hiar, *Business Model Concerns Undermine Utilities' Energy Efficiency, Smart Grid Work*, SNL POWER DAILY, Oct. 16, 2012; Tom Tiernan & Herman Wang, *Utility Business Model at 'inflection point' as Technology, Smart Grid Change the Game*, ELECTRIC UTILITY WK., Oct. 8, 2012.

17. Than, *supra* note 6.

18. Michael T. Burr, *Microgrid Milestones*, PUBLIC UTILITIES FORTNIGHTLY (Dec. 19, 2013), http://spark.fortnightly.com/fortnightly/microgrid-milestones.

19. Than, *supra* note 6.

20. Ronald Lehr, *New Utility Business Models: Utility and Regulatory Models for the New Era*, ELECTRICITY J., Oct. 2013, at 40.

remain only one set of utility transmission and distribution lines, unlike multiple pole attachments of different phone and cable service lines and wireless phone technology.[21] The final shape of the evolving model is not possible to discern yet.

Business models must evolve to meet the challenge of climate change[22] as well as these new pressures. The traditional business model for regulated utilities was to sell kWh. Now a broader range of services must be provided by utilities when they no longer have a monopoly on power supply.

Under a system of decoupled utility rates, utilities become energy-service providers with energy efficiency being just one facet of their service, instead of simply being merchants of electrons for power.[23] There is a prediction that the new utility business model will focus on "outputs" rather than "inputs" in utility regulation.[24] Under some hypothecated new business models, utilities would become neutral managers of grid infrastructure, brokers of new customer relationships, partners with service providers, or financiers of infrastructure.[25] Meister Consulting Group, in a study for the International Energy Agency ("IEA"), forecasts a new era of "prosumers,"[26] who will develop their own PV solar power on-site to cause a decentralized electric supply internationally to "evolutionize the utility sector just as personal computers and cell phones changed their respective industries."[27]

Consumers typically are charged for electric service as a function of the quantity of power purchased rather than as fixed costs.[28] When fixed utility grid costs are allocated to a smaller volume of sales, costs for those

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21. For more on pole attachment, *see* STEVEN FERREY, *Law of Independent Powers*, THOMSON REUTERS § 10:3 (36th ed. 2015).

22. Lehr, *supra* note 21, at 35.

23. Katherine Ling, *Rising Temps Melt Electric Utilities' Business Models*, N.Y. TIMES, Sept. 10, 2009, *available at* http://www.nytimes.com/gwire/2009/09/10/10greenwire-rising-temps-melt-electric-utilities-business-72148.html.

24. Ronald Lehr, "*New Utility Business models*," *supra*, at 50. (Inputs are easily quantifiable in the form of costs of utility operation; outputs are more subjective elements).

25. L. Bird et al., *Regulatory Considerations Associated With The Expanded Adoption Of Distributed Solar* (Scott Gossett & Mary Lukkonen eds., 2013), http://www.nrel.gov/docs/fy14osti/60613.pdf.; James Newcomb, Virginia Lacy & Lena Hansen, *New Business Models For The Distribution Edge: The Transition From Value Chain To Value Constellation* (2013), http://www.rmi.org/cms/Download.aspx?id=10469&file=201306_eLab NewBusinessModels.pdf.

26. WILSON RICKERSON ET AL., RESIDENTIAL PROSUMERS—DRIVERS AND POLICY OPTIONS (RE-PROSUMERS) 13 (2014), http://iea-retd.org/wp-content/uploads/2014/06/RE-PROSUMERS_IEA- RETD_2014.pdf (some studies have also recently suggested that a more robust definition of electricity prosumers would also incorporate elements such as the ability to react to dynamic pricing, the use of demand response, and integration with smart grid infrastructure).

27. *Id.* at 5.

28. *Id.* at 48.

customers remaining in service increase retail electricity costs.[29] It is not just utility companies which could lose revenue in this new distributed generation model. The state government receives a significant benefit from invisible taxes embedded in typical utility bills and local government receives property taxes on utility poles and wires, whose value could be decreased as a lesser amount of power flows through it. Regulated utility companies pay taxes based on net income and on gross receipts.[30] As self-generation and competition absorb more power creation and supply, utility gross receipts decline and state taxes decline correspondingly.

Looking at California's immediate eastern neighbor state, Arizona Public Service ("APS"), in late July 2014, filed with the Arizona Corporation Commission a plan called *AZ Sun DG* under which APS would lease conventional consumer rooftops for its own PV generation purposes.[31] Under a 20-year conventional lease, APS would pay homeowners $30 per month (set off as a billing credit) for use of the roof to install and own 20 mW of solar photoelectric systems on 3,000 customer homes.[32] APS would incur itself the capital, installation, and maintenance costs estimated at $57 million to $70 million for 3,000 homes each with 4 to 8 kW systems, or $19,000 to $24,350 per home ($3,000 to $5,000/kW installed).[33]

The key distinction is that these would not be distributed generation: They would be on the utility side of the meter, which meter would be below the solar roof unit at grade in the dwelling. Therefore, the power would be regarded as any other utility-owned generation project, but

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29. Jeff McMahon, *Steven Chu Solves Utility Companies' Death Spiral*, FORBES (Mar. 21, 2014), http://www.forbes.com/sites/je ffmcmahon/2014/03/21/steven-chu-solves-utility-companies-death-spiral/; *see also* Herman Trabish, *California PUC President: The utility death spiral is 'last year's hype,'* GREENTECH MEDIA (Jan. 29, 2014), http://www.greentechmedia.com/articles/read/The-Utility-Death-Spiral-is-Last-Years-Hype-California-PUC- President.

30. Sheldon Silver, *The Electric Industry in New York* (1996) (Citing Section III, Table 3) (regulated utility companies pay taxes based on net income and on gross receipts. Taxes imposed on utilities include the 9A Corporate franchise Tax, the Gross Receipts Tax and the Sales/Use Tax. There also can be local taxes including business income/gross receipts taxes, sales taxes and property taxes.), http://assembly.state. ny.us/Reports/Energy/199710/#III.%20FACTORS%20AFFECTING%20ELECTRICITY%20COSTS; *see also* Marilyn Marks Rubin, *A Guide To New York State Taxes: History, Issues And Concerns* 9–4 (2011), http://pjsc.magikcms.com/Tax%20guides/ StateGuideWeb.pdf.

31. Bruce W. Radford, *Rent the Rooftop: A New Front Opens in the Solar Wars*, FORTNIGHTLY, http://www.fortnightly.com/fortnightly/2014/08/rent-rooftop#sthash.kJNGCRsO.dpuf.

32. *Id.*

33. *Id.*

situated on land and structures owned by the customer rather than the utility. However, here, the meter is the message. On which side of the meter placement one constructs power generation is critical. APS would own both the PV panels and the power output of them. All power would later be transacted as retail power at the regulated retail rate.[34]

This is a means to accelerate use of solar, but not to accelerate distributed generation. It preserves utility use of the transmission and distribution network, and customer contributions to the utility for such power. Ken Johnson, Solar Energy Industries Association, reacted to this:

> In a move condemned by many solar companies in Arizona, the state's largest utility, APS, has announced that it will begin installing rooftop solar on customers' homes. After attacking rooftop solar companies in Arizona relentlessly for more than a year, this latest tactic by APS has a 'Trojan Horse' smell to it. Our member companies welcome fair and equal competition, but this move would stack the deck in favor of a company which can rate base solar with a guaranteed rate of return. How is that fair? The Arizona Corporation Commission needs to think this through very carefully.[35]

The home customer receives $360 per year, or more than $4,000 over twenty years, for outlaying no capital, taking no risk, not compromising its electric service provision, and having a 'solar home.' If there is any central disruption in service during peak daytime hours, depending on precisely how the solar output is wired, the customer could be insulated from a central service disruption. It is a formula which is roughly equivalent to approximately a 50% reduction in the cost of electric service.

With a median size 5 to 6 kW PV array, APS might generate something in the range of 8,000 kWh of electricity, which would have a retail value of approximately $4,000 per year and more than twice this retail value when delivered to a consumer account. The host consumer cuts its electricity costs roughly in half with no or little risk, the utility generates power worth more than its out-of-pocket capital and operational cost, and the utility is able to realize retail transmission and distribution charges associated with all power. And the state realizes a policy goal of reducing criteria pollution and carbon emissions while going solar.

The issue here, though, is not so much as to whether it is a viable solar promotional mechanism, but whether it contradicts on-site distributed generation, whether that is a valid consideration, and whether a significant utility presence distorts the solar industry or competition in the state. It is

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34. *Id.* (This differs from the so-called "Buy All, Sell All" business model where the utility buys the customer-owned output at the lower wholesale rate and sells back the power to customers at the higher retail rate, thus still collecting and payment for transmission and distribution).

35. *Id.*

argued that the grid operator has clear incentives to favor increasing the utility's assets rather than to encourage customer-owned distributed energy resources.[36] And some argue that "it is imperative that we separate grid operation from grid ownership and delegate operation to" an independent distribution system operator.[37] There also is a question about this business model as to whether a utility should place in its rate base and earn a return on equipment installed in the customers' residences.

At present, there are few models for a transition to new business models.

C. What Exactly is Electricity?

What has not changed is the electricity itself. Electric circuits are the physical means for conveying energy in a force field to different places, but always within the lines or attachments to it .[38] Electricity is identical in every state at every moment: An energy field transmitted as alternating current at 60 Hertz and cycles per second.[39]

New intermittent wind and solar renewable resources cannot supply reliable base load power, as they demonstrate a relatively low availability factor in the 10% to 40% range of hours during a week or month.[40] Wind generators have plant effective capacity factors of 20% to 30%. Storage of electricity is the critical missing link. We do not have any means to store electricity per se. Instead, as a substitute, we convert electricity either into chemical energy, in batteries, stored physical energy potential compressed air, or greater elevated reservoir capacity in hydroelectric pumped storage

36. James Tong & Jon Wellinghoff, *Rooftop Parity: Solar for Everyone, Including Utilities*, FORTNIGHTLY, http://www.fortnightly.com/fortnightly/2014/08/rooftopparity?page=0%2C1&authkey=694f9b6d88b73bb34af7a1dfe32592897cf7300b810bfb7d7d2030eab37ffed0; Farrokh Rahimi & Sasan Mokhtari, *From ISO to DSO: Imagining a New Construct—An Independent System Operator for the Distribution Network*, FORTNIGHTLY 42, http://www.fortnightly.com/for tnightly/2014/06/iso-dso.

37. Tong, *supra* note 36.

38. HUGH D. YOUNG & ROGER A. FREEDMAN, UNIVERSITY PHYSICS 799 (Addison Wesley Pub. 1996).

39. World Electricity Standards (citing http://www.worldstandards.eu/electricity/plugs-and-sockets/) (the electricity in the world is transmitted via alternating current, where the current changes direction of flow either 50 or 60 times per second.), http://www.quantumbalancing.com/worldelectricity/electricityif.htm.

40. *See* STEVEN FERREY, LAW OF INDEPENDENT POWER § 2.12 (36th ed. 2015) (noting inability of intermittent sources to serve as base-load resource).

facilities, active physical energy in flywheel revolution, or thermal energy as heat storage.[41]

Unlike all other forms of energy, the moving electrons cannot be efficiently stored as electricity for more than a second before they are lost as waste heat.[42] Therefore, the supply of electricity must match the demand for electricity over the centralized utility grid on an instantaneous, constant, real-time, and ongoing basis, or else the electric system shuts down or expensive equipment is damaged.[43] Either too much or too little power causes system instability on a second-by-second basis.[44]

As distributed solar has increased, the magnitude and frequency of voltage fluctuations are more of a problem, increasing maintenance costs and earlier replacements of certain components. [45] When solar PV output on distribution lines exceeds the instantaneous load on that line, it can cause power back-flows between the low-voltage and medium-voltage lines. This causes reliability problems.[46] There can be stability issues when PV inverters trip off because of grid voltage or frequency fluctuations.[47] Grid management is projected to be able to handle up to 30% renewable penetration.[48]

Moreover, while generators spin to increase their temperatures to their design values, the power that these units produce may or may not be used by the grid, thus incurring power "uplift" costs to the grid.[49] First, grid modifications, upgraded circuits and transformers, and expansion of the transmission and distribution infrastructure are necessary for renewables, but not otherwise required anywhere near this degree.[50] Second, there is a need for installation on the system of more quick-start spinning reserve to respond to the constant intermittency of solar and wind generation and provide load-following generation.[51] This is a very large and often

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41. *Id.* § 2.21.

42. STEVEN FERREY, ENVIRONMENTAL LAW 568 (6th ed. 2013).

43. MICHAEL BRUCH ET AL. CRO FORUM, POWER BLACKOUT RISKS 6 (Markus Aichinger ed., 2012), https://www.allianz.com/v_1339677769000/media/responsibility/documents/position_paper_power_blackout_risks.pdf; *see* FERREY, *supra* note 42.

44. Bruch et al., *supra* note 43.

45. Rickerson, *supra* note 2, at 52.

46. *Id.* at 53–54.

47. *Id.* at 54.

48. PJM, *Executive Summary of Renewable Integration Study for PJM,* http://www.pjm.com/~/media/committees-groups/committees/mic/20140303/20140303-pris-pjm-cover-letter.ashx.

49. J. Nicholas Puga, *The Importance of Combined Cycle Generating Plants in Integrating Large Levels of Wind Power Generation*, 23 ELECTRICITY J. 33, 34, Aug.–Sept. 2010.

50. Lincoln Davies and Kirsten Allen, *Feed-In Tariffs in Turmoil*, 116 W. VA. L. REV. 937, 1002 (2014).

51. *Id.*

uncalculated cost, only necessary because of the switch to intermittent generation supplied by wind and PV units.

All of this changes in the new business model. Rather than utilities, independent power companies (IPPs) constructed most generations for the past several years. If these IPPs bear the extra interconnection-related transmission and distribution system modification and upgrade costs caused by independent generation, this often significant cost is never passed on to utility rate-payers. IPPs also may be dispatched in a manner so that they effectively bear the added system costs for more system spinning reserves and quick-start power to integrate intermittent power into a system without compromising reliability.[52] If instead, these costs are socialized to all utility customers as part of the transmission and distribution system, no customers avoid them—not even in those 15 or so retail-competition states where customers can purchase power from other sources than the utility.

Of note, all states still allocate these T & D costs based on volume of electricity consumption, not by a fixed fee per customer. Therefore, where general T & D costs are spread to all consumers on a volumetric basis, distributed generators are able to supply some or all of their own electricity on-site from their generation unit, and offset some or all of their T & D charges. Therefore, distributed generators can avoid what would otherwise be their volumetric share of what revenues eventually become their own cross-subsidy for their share of system modification and additional ancillary and spinning reserve requirements—which can impose these ancillary intermittent distributed generation costs on only those who still use the grid. State regulators and courts will have to make this fundamental decision.

52. Puga, *supra* note 49, at 34.

III. THE STATE REGULATORY INCENTIVES THROUGH UTILITIES

The states have undertaken most renewable energy policy initiatives in the past two decades, sculpting sustainable energy policy around five legal and policy initiatives:

- Net Metering: In 85% of states.
- Renewable portfolio standards: In 65% of states.
- Renewable System Benefit Charges: In 33% of states.
- Carbon and GHG regulation: In 20% of the states.
- Feed-In Tariffs: In < 10% of states.

Each of these can be a powerful stimulant to sustainable renewable energy deployment in a market economy. Each initiative provides a financial inflow at either the point of project construction or generation of renewable electric power. The state acts as a regulator, and never owns the capital equipment for renewable power generation, nor transacts any sale of the power produced. And it is this action as a regulator, rather than a market participant, which raises Constitutional issues with discriminatory state renewable energy initiatives.[53] Each of these state measures torques the operation of the electric energy market through regulation. And for the conventional utility model of cost recovery based on assets, it can create legal barriers isolating the cash flow in the model.[54]

A. FiTs—Energy Regulation

A feed-in tariff ("FiT") is a regulatory requirement imposed by some states on their regulated utilities to purchase designated types of independent power generation on a wholesale basis. Typically, this includes renewable resources or combined heat and power ("CHP") units, at prices well in excess of the market value of wholesale power.[55] The regulated utilities are forced to "buy high" in terms of other electric power available in the market.[56] FiTs allocate revenue in the operating power

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53. *See* FERREY, ENVIRONMENTAL LAW *supra* note 42, at 162–64; 167 (examining the market participant exception).

54. "Ring-fencing occurs when a portion of a company's assets or profits are financially separated without necessarily being operated as a separate entity. This might be for regulatory reasons." WIKIPEDIA, Ringfencing, http://en.wikipedia.org/w/index.php?title=Ringfencing&oldid=634792734.

55. STEVEN FERREY, THE LAW OF INDEPENDENT POWER § 10:134 (36th ed. 201).

56. Electric power in the Northeast has been available at an average price during the past years of $0.05/Kwh or less. Steven Ferrey, *The Fifth Dimension: Legal Infrastructure, Cracks, and Governance*, 15 MINN. J. L. SCI. & TECH. 469, 473 n.23 (2014); *see generally* U.S. Energy Info. Admin., Electricity, ELECTRIC POWER ANNUAL 2012 (Dec. 6, 2013), http://www.eia.gov/electricity/annual/pdf/epa.pdf (providing the annual statistics for each

market in favor of the sellers of certain state-designated power, without adhering to accepted rate-making methodology to minimize prudent utility-incurred costs.[57] Costs of a FiT are passed on to captive consumers by the utility companies which pay FiTs.[58]

One commenter has noted that "many advocates of alternative energy heap acclaim on feed-in tariffs, with one observer declaring them simply 'fabulous.'"[59] "The line of scholars, analysts, and advocates rushing to say that feed-in tariffs are better [than other mechanisms] is not a short one."[60] However, FiTs have not been seamless, in practice. Problems highlighted with FiTs include the long-term expense of FiTs, windfall profits realized by project developers, and inequity between well-off citizens compared to lower-income citizens.[61]

Despite a series of lawsuits and accessible articles in the technical and general press,[62] advocates for renewable power are still urging states to adopt FiTs in the U.S, despite the fact that they are unconstitutional when adopted at the state regulatory level.[63] The federal courts and Federal Energy Regulatory Commission (FERC) separately struck down such

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state's average cost to the ultimate consumer for electric power); The Vermont FiTs for power of this value were set for wind of < 15 kW at $0.20/kWh, for wind > 15 kW at $0.125/kWh, and for solar generation at $0.30/kWh. Ferrey, *supra* note 55.

57. FERREY, THE LAW OF INDEPENDENT POWER, *supra* note 55, § 10:113.

58. *Id.* §10:134.

59. Lincoln L. Davies & Kirsten Allen, Feed-in Tariffs in Turmoil, 116 W. VA. L. REV. 937, 938–39 (2014).

60. *Id.*

61. *Id.* at 940.

62. *See* Steven Ferrey, *Goblets of Fire: Potential Constitutional Impediments to the Regulation of Global Warming*, 35 ECOLOGY L. Q. 835 (2008); Steven Ferrey, Chad Laurent & Cameron Ferrey, *Fire and Ice: World Renewable Energy and Carbon Control Mechanisms Confront Constitutional Barriers*, 20 DUKE ENVTL. L. & POL'Y F. 125 (2010); Brian H. Potts, *Regulating Greenhouse Gas Leakage: How California can Evade the Impending Constitutional Attacks*, 19 ELECTRICITY J. 43, 43–44 (2006) (". . . because of these two Constitutional issues, courts are likely to strike down many or all of their proposals"); Steven Ferrey, Chad Laurent & Cameron Ferrey, *FIT in the USA: Constitutional Questions About State-Mandated Renewable Tariffs*, FORTNIGHTLY MAG. (June 2010), http://www.fortnightly.com/fortnightly/2010/06/fit-usa?page=0%2C0; Steven Ferrey, *Shaping American Power: Federal Preemption and Technological Change*, 11 VA. ENVTL. L.J. 47 (1991–1992); Steven Ferrey, *Follow the Money! Article I and Article VI Constitutional Barriers to Renewable Energy in the U.S. Future*, 17 VA. J.L. & TECH. 89, 110–13 (2012).

63. Paul Gipe, *Time to Break Free of Net Metering; We Need a 'FiT' Policy for Renewable Energy to Soar*, NAT'L GEOGRAPHIC BLOG (Dec. 26, 2013), http://energyblog.nationalgeographic.com/2013/12/26/breakfree-net-metering/.

FiTs in California in the 1990s.[64] And having not succeeded before both the 9th Circuit Court of Appeals and FERC in the mid-1990s,[65] California implemented more FiTs fifteen years later. After enacting a feed-in-tariff requiring California state utilities to make wholesale power purchases at well in excess of wholesale rates and in excess of avoided costs, this was a challenge at the Federal Energy Regulatory Commission as to whether this violated the Federal Power Act and the Supremacy Clause of the U.S. Constitution.

California argued that its environmental purpose for regulation should make it exempt from preemption in setting above-market wholesale feed-in renewable tariff rates for cogeneration facilities of less than 20 Mw and that environmental costs could be considered to inflate avoided costs.[66] The affected utilities and others countered that federal law does not allow state regulation of wholesale sales to achieve state environmental goals, and that federal preemption cannot be avoided based on an environmental purpose of the preempted state regulation. The utilities also noted that states may not under the guise of environmental regulation adopt an economic regulation that requires electricity purchases at a wholesale price outside the framework of the Federal Power Act, or if acting under PURPA, at a price that exceeds avoided cost.[67]

FERC again struck California's feed-in tariffs, and held that wholesale generators can receive no more than system-wide avoided cost for power sales: "even 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."[68] FERC rejected all of California's arguments regarding generic environmental rationales for wholesale rates in excess of limits under federal law or as set by FERC.[69] FERC held that its authority under the Federal Power Act includes the exclusive jurisdiction to regulate the rates, terms and conditions of sales for resale of electric energy in interstate commerce.[70]

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64. Indep. Energy Producers Ass'n v. Cal. Pub. Utils. Comm'n, 36 F.3d 848, 853 (9th Cir. 1994); S. California Edison Co., 159 P.U.R.4th 381, ¶ 61675 (FERC Feb. 22, 1995).

65. Indep. Energy Producers Ass'n, 36 F.3d at 850; 159 P.U.R.4th at ¶ 61675.

66. California Pub. Utilities Comm'n S. California Edison Co. Pac. Gas & Elec. Co. San Diego Gas & Elec. Co., 132 FERC ¶¶ 61,047, 61,338–39 (July 15, 2010).

67. *Id.*

68. *Id.*

69. *Id.*

70. 16 U.S.C §§ 824(d)–(e) (2006); *e.g.*, Miss. Power & Light Co. v. Miss. ex rel. Moore, 487 U.S. 354 (1988).

California argued that its environmentally beneficial purposes should make it exempt from preemption in setting non-market-conforming wholesale rates for a state FiT.[71] FERC found state purpose to not permit illegal establishment of FiTs requiring purchases of electricity at inflated wholesale prices[72] and renewable wholesale generators could receive no more than fair wholesale market prices under federal law.[73] FERC reiterated that only the federal government can regulate commerce between the states and California cannot attempt to regulate commerce outside its borders.[74]

B. Net Metering

Under net metering, allowed in 43 states including California, for a customer who purchases and uses electricity from the distribution company, the meter runs forward; when more electricity is produced from the facility than is consumed by the customer, the excess is sent to the electricity grid, running the meter in reverse direction and reversing the net accounting of power flow.[75] By turning the meter backwards, and because only a single rate applies to a single meter, net metering effectively compensates the generator at the full retail rate (which includes approximately two-thirds of the retail bill attributable to transmission, distribution, and taxes) for transferring just the wholesale energy commodity—the power itself.[76]

In essence, it receives for that power an amount that could be above the utility's avoided cost, and does not compensate for distribution investments made by the utility. Net metering is not designed to afford a fair price

71. Cal. Pub. Util. Comm'n, 132 FERC ¶ 61,047 (2010), Order on Petitions for Declaratory Order.

72. *Id.* ¶¶ 17–18. (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).

73. 33 FERC ¶ 61,059, at 71 (FERC Order Granting Clarification and Dismissing Rehearing).

74. *Id.*

75. *See* Glossary, Database St. Incentives for Renewables & Efficiency, http://www.dsireusa.org/glossary. ("When a customer's generation exceeds the customer's use, electricity from the customer flows back to the grid, offsetting electricity consumed by the customer at a different time during the same billing cycle.").

76. *Id.* ("In effect, the customer uses excess generation to offset electricity that the customer otherwise would have to purchase at the utility's full retail rate."). As to whether electricity is a "good" or a "service" and how it should be treated under the law, see STEVE FERREY, THE NEW RULES: A GUIDE TO ELECTRIC MARKET REGULATION 211–31 (2000).

based on ratemaking law; but is a random price generally equal to the retail price, which has no direct correspondence to the value of wholesale power traded in the market. It adopts a retail price already determined in other tariffs, but bearing no relationship to wholesale markets. It is wholly divorced from rate making principles, ignoring that the net metering customer uses the distribution grid twice (going and coming) and assessed as not using the grid at all.

Net metering is more an accounting convention applied to trading power than it is a legal commodity sale according to case decisions, and it typically is applicable by state law and order to renewable sources of distributed power on the customer's side of the retail utility meter.[77] Electricity has a unique physical characteristic: It cannot be stored efficiently as electricity; storage of electricity occurs indirectly in a different form as physical or chemical energy, rather than as electricity.[78] 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 expensive equipment is damaged.[79]

Convenience of a numeric value does not justify its use for different purposes. National Grid estimated that net metering costs will more than double between summer 2013 and the end of 2013 ($0.09/month to $0.23/ Month), and then more than triple again by the end of 2014($0.93/ month).[80] Utilities in California estimate that net metering may mean as much as $1.4 billion a year in lost revenue that will have to be added to the bills of non-net-metering customers.[81] State utilities want stricter limits on the size of net metering units: San Diego Gas & Electric Company alleged that net metering provided an "unfair and unsustainable subsidy" of approximately $34 from each other customer to net metering customers.[82] The California Public Utility Commission reported that by 2020, net

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77. Steven Ferrey, *Virtual "Nets" and Law: Power Navigates the Supremacy Clause*, 24 GEO. INT'L ENVTL. L. REV. 267, 273 (2012); *see also* GLOSSARY, DATABASE ST. INCENTIVES FOR RENEWABLES & EFFICIENCY, http://www.dsireusa.org/glossary/ (providing a definition of "net metering").

78. *See* Ferrey, ENVIRONMENTAL LAW, *supra* note 42, at 568 (describing inability to store electricity).

79. STEVEN FERREY, UNLOCKING THE GLOBAL WARMING TOOLBOX: KEY CHOICES FOR CARBON RESTRICTION AND SEQUESTRATION 149 (2010) (describing how electric system operates).

80. Bruce Mohl, *The Back Story: Green Energy Concerns*, COMMONWEALTH MAG., Aug. 8, 2013.

81. Diane Cardwell, *On Rooftops, a Rival for Utilities*, N.Y. TIMES, July 26, 2013, at B1.

82. Lisa Weinzimer, *Consumer and Solar Groups Pan SDG&E's Planned Surcharge, Saying It May Be Illegal*, ELECTRIC UTIL. WK., Nov. 21, 2011, at 18.

metering could cost non-solar electricity customers $370-$1.1 billion per year.[83]

Idaho moved in 2013 to adjust the amount net-metering facilities in the state are paid, in order to lessen electric company/ratepayer impacts. This increases customer demand charges in the distribution rates and commensurately decrease retail energy rates. The intent is to even out rates paid by participating and non-participating net-metering customers, and alleviate the burden on utilities and their customers.[84]

Virginia introduced legislation to allow Dominion Virginia Power to collect a standby charge from customers with net-metered systems larger than 10 kW.[85] There have been proposals on net-metered tariff changes in Arizona and Georgia.[86] Arizona in late 2013 imposed an additional fee of approximately $4.90/month on solar installations.[87]

C. State Renewable Portfolio Standards and the Commerce Clause

Twenty-nine states and the District of Columbia have enacted state renewable portfolio standards (RPS).[88] A resource portfolio requirement requires certain electricity sellers and buyers to maintain evidence of a predetermined percentage of designated clean resources in their wholesale electric supply mixes.[89] Several states also award rebates to customers

83. Than, *supra* note 6, at 3.

84. Idaho Pub. Util. Comm'n, Case No. IPC-E-12-27, Order No. 32767 (Mar. 25, 2013).

85. Virginia Incentives/Policies for Renewables and Efficiencies, Database of St. Incentives for Renewables & Efficiency, http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=VA02R (last updated July 2, 2014).

86. *See Standby & Fixed Cost Charges And Net Energy Metering Debates: Current Status*, NC CLEAN ENERGY TECH.CNTR., http://nccleantech.ncsu.edu/wp-content/uploads/State-Status-of-NEM-Standby-+-Fixed-Cost-Charge-Debates_V2.pdf.

87. *Id.* (New net-metered rooftop solar system are charged about $4.90 per month as of January 2014)

88. *See Renewable Portfolio Standard Policies*, DATABASE ST. INCENTIVES FOR RENEWABLES & EFFICIENCY, http://www.dsireusa.org/documents/summarymaps/RPS_map.pdf (last visited Mar. 2013).

89. The resources such as renewables, DSM, or high efficiency fossil combustion, as defined by a particular state, would be included in the company's overall resource portfolio. Portfolio requirements can be applied to electricity sellers, such as generation companies and vertically integrated utilities as a condition of continued market access. The requirements could also be applied to wholesale electricity buyers, such as distribution companies and electricity brokers but the states do not exercise authority over wholesale markets.

who install solar systems.[90] Generators of PV power can make direct bilateral sales of their S-RECs to retail suppliers of power, which will have to purchase enough S-RECs each year to equal the required percentage of power generation set by the state.

RPS programs have been characterized as a form of 'backdoor' renewable subsidies.[91] It is estimated that 45% of the 4,300 MW of wind power installed in the U.S. between 2001 to 2004 was motivated by state renewable portfolio standards, while an additional 15**%** of these installations were motivated by state renewable energy trust funds and subsidies.[92] The current RPS standards are projected to add 76,750 MW of additional renewable generation by 2025.[93]

The cost of acquiring the required RECs is passed on to captive retail power consumers.[94] The California Public Utility Commission ("PUC") Division of Ratepayer Advocates criticized the rapid escalation in California ratepayer costs to achieve the RPS mandate.[95] The cost of RPS compliance exceeded the cost of the power itself.[96]

As a quick calculation, the typical national cost to the utility to purchase RECs is approximately a 40% increase in cost of the value of the wholesale power itself (not the total cost of retail bundled cost including taxes).[97] For a utility in Massachusetts, the REC purchase price is currently about equal to the wholesale cost of the power itself.[98] With solar RECs, in some states it is averaging 400-500% over the value of the power in terms of the cost to utilities for solar RECs.[99] The ACP penalty price to the utility of not complying can be + 1000% the value of the power involved.[100]

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90. K.S. Corey & B.J. Sweazey, *Renewable Portfolio Standards In The States: Balancing Goals And Implementation Standards* 11–12 (National Renewable Energy Laboratory, NREL/TP 670–41409, 2007).

91. Robert Glennon & Andrew M. Reeves, *Solar Energy's Cloudy Future*, 1 ARIZ. J. ENVTL. LAW & POL'Y 91, 106 (2010).

92. Ryan Wiser & Mark Bollinger, *Balancing Cost and Risk: The Treatment of Renewable Energy in Western Utility Resource Plans*, ELECTRICITY J., Jan./Feb. 2006, at 48.

93. Brad Plummer, *The Biggest Fight Over Renewable Energy is Now in the States*, WASH. POST, Mar. 25, 2013.

94. *See* Glennon & Reeves, *supra* note 92, at 108.

95. Geoffrey Craig, *Renewable Costs of California's Three Big Utilities Soared Last Year, CPUC Data Shows*, ELECTRIC UTIL. WK., Feb. 13, 2012, at 18.

96. *Id.*

97. Author's calculation assuming a trading price of $15–20 for a state REC.

98. Author's calculation, assuming $60/REC selling price, with wholesale power being transacted in ISO-NE at approximately an average price of $50/Mwh.

99. Author's calculations with Massachusetts solar RECs selling in the $220–500/SREC trading range.

100. Author's calculation, comparing an ACP of $550/SREC in Massachusetts with the $50/Mwh average price of power.

A number of states have enacted RPS law which treats renewable energy created in the state or immediate geographic region preferentially to renewable energy generated in other states. This raises significant constitutional issues. Some prohibit the REC credit for out-of-state or out-of-region generation facilities.[101] These geographic program restrictions raise dormant commerce clause concerns under the U.S. Constitution. A number of the twenty-nine states with RPS that have incorporated credit multipliers, geographic restrictions, or preferences to promote in-state/in-region generation of power, to the exclusion of external power, in the following percentages:

- Eight of the twenty-nine RPS states, or 27%, have REC multipliers for in-state generation: Arizona,[102] Colorado,[103] Delaware,[104] Maine,[105] Michigan,[106] Missouri,[107] Nevada,[108] and Washington.[109]
- Four of the RPS states, or 14%, including two states that also provide for a geographically discriminatory REC multiplier, have or earlier had either a requirement or preference for in-state generation: California,[110] Colorado,[111] North Carolina,[112] and Ohio.[113]
- Four of the twenty-nine RPS states, or 14%, give program preferences to the use of in-state manufactured products or

101. Corey & Sweazey, *supra* note 90, at 8.
102. ARIZ. ADMIN. CODE § R14-2-1806(D)–(E) (2009).
103. COLO. REV. STAT. § 40-2-124(1)(c)(V)(A)–(D), (1)(c)(IX), (1)(d) (2013).
104. DEL. CODE ANN. tit. 26, § 356(a)(1), (d)–(e) (2012).
105. ME. REV. STAT. tit. 35-A, § 3605 (2010).
106. MICH. COMP. LAWS SERV. § 460.1039(1) (LexisNexis 2010).
107. MO. ANN. STAT. § 393.1030(1) (West 2013).
108. NEV. REV. STAT. ANN. § 704.7822 (LexisNexis 2011).
109. WASH. ADMIN. CODE § 194-37-110(1)(c)(i)–(ii) (2008).
110. *California Incentives/Policies for Renewables & Efficiency*, DATABASE ST. INCENTIVES FOR RENEWABLES & EFFICIENCY (June 25, 2014), http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=CA25R&re=1&ee=1 (explaining that a maximum of 25% of RPS compliance can be achieved through the use of tradable renewable energy credits; therefore, the remainder of the RPS compliance must be attained through in-state power sales).
111. COLO. REV. STAT. § 40-2-124 (1)(e)(II)–(III) (2013).
112. N.C. GEN. STAT. ANN. § 62-133.8(b)(2)(e) (West 2012).
113. OHIO REV. CODE ANN. § 4928.64(B)(3) (LexisNexis 2012).

in-state labor forces: Arizona,[114] Delaware,[115] Michigan,[116] and Montana.[117]

- Eleven of the twenty-nine RPS states, representing 38% of RPS states, have a requirement for in-region, rather than in-state, geographic location of generation to create RECs, including one of the states that also has in-state multipliers and one with an in-state preference: Connecticut,[118] Illinois,[119] Maine,[120] Maryland,[121] Massachusetts,[122] New Hampshire,[123] North Carolina, Ohio,[124] Oregon,[125] Pennsylvania,[126] and Rhode Island.[127]
- Eleven of the twenty-nine states, or 38%, have an in-state requirement for certain distributed power.[128]
- Four of the twenty-nine states, or 14%, have a benefit for an in-state capital component or labor.[129]
- Some states have multiple multipliers and preferences.[130]
- Only seven of the twenty-nine states, or 24%, have no geographic preferences in their laws.[131]

California requires a certain amount of RECs to effectively be bundled with electricity generated from renewable resources in or connected to state transmission, which has a discriminatory effect on out-of-state

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114. ARIZ. ADMIN. CODE § R14-2-1806(D)–(E) (2007).
115. DEL. CODE ANN. tit. 26, § 351(b)–(c) (2009).
116. MICH. COMP. LAWS SERV. § 460.1001(2)(a)–(d) (LexisNexis 2010).
117. MONT. CODE ANN. § 69-3-2005(3)(a) (2013).
118. CONN. GEN. STAT. ANN. § 16-245a(b) (West 2013).
119. 20 ILL. COMP. STAT. ANN. 3855/1-56(b) (West 2013).
120. 65-407-311 ME. CODE R. § 6 (LexisNexis 2011).
121. MD. CODE REGS. 20.61.03.03(D) (2011).
122. MASS. ANN. LAWS ch. 25A, § 11F(a) (LexisNexis 2013).
123. N.H. REV. STAT. ANN. § 362-F:6(I) (LexisNexis 2011).
124. OHIO REV. CODE ANN. § 4928.64(C)(5) (LexisNexis 2012).
125. OR. REV. STAT. § 469A.135(1)(a), (2) (2011).
126. 73 PA. STAT. ANN. § 1648.4 (West 2008).
127. R.I. GEN. LAWS § 39-26-4(d) (2012).
128. Steven Ferrey, *Threading the Constitutional Needle with Care: The Commerce Clause Threat to the New Infrastructure of Renewable Power*, 7 TEX. J. OIL GAS & ENERGY L. 59, 75–77 (2012) (noting that resource eligibility in state RPS programs has expanded beyond traditional renewables) [hereinafter *Threading the Constitutional Needle*].
129. Steven Ferrey, *Alternative Energy in a Spaghetti Western: Clint Eastwood Confronts State Renewable Energy Policy*, 32 UTAH ENVTL. L. REV. 279, 292 (2012) (listing Arizona, Delaware, Michigan, and Montana as having this in-state benefit) [hereinafter *Alternative Energy*].
130. *Id.* at 291–92.
131. *Threading the Constitutional Needle*, *supra* note 128, at 79.

facilities.[132] California made a decision in 2010 that renewable energy credits, to satisfy the California renewable portfolio standard, can be tradable credits from the Western Renewable Energy Generation Information System. A decision in California of the Public Utilities Commission was to limit investor-owned utilities' use of tradable RECs to five percent of total annual renewable procurement targets between 2009 to 2011. In 2010, the limit was changed by regulators to allow 25% of the California RPS to be satisfied by tradable RECs that are not bundled with the electric power.[133]

While this would seem like a more open-minded removal of state barriers, it operates in the opposite fashion. Before, it could have been 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 system has the effect of limiting out-of-state renewable generation RECs to a minority share of the compliance credits. Four states—Alabama, Texas, Nebraska and North Dakota—indicated that they were planning to bring suit against California claiming their RPS program interfered with interstate commerce.[134]

Most recently, Justice Richard Posner of the Seventh Circuit Court of Appeals, in a unanimous decision, affirmed the Federal Energy Regulatory Commission's approval of the Midwest Independent Service Operator's (MISO)[135] proportionate customer utility allocation of interstate transmission costs for high-voltage transmission lines to move renewable wind power to populated areas.[136] The Court used a 2012 law review article, authored

132. The California Public Utilities Commission staff recognizes that this could invoke constitutional problems. *See* CAL. PUB. UTIL. COMM'N, DIV. OF STRATEGIC PLANNING, RENEWABLE ENERGY CERTIFICATES AND THE CALIFORNIA RENEWABLES PORTFOLIO STANDARD PROGRAM 90–91 (2006).

133. CAL. PUB. UTIL. COMM'N, DOCKET NO. 10-03-021 2, 4, 80 (2010).

134. Michael N. Mills, *Will California's 33% Renewable Portfolio Standard Survive a Commerce Clause Challenge by Other States? A Recently Filed Colorado Case May Provide the Answer*, THE OVERRIDE, May 2011, at 6, http://www.stoel.com/Files/The Override_CaseoftheMonth_may2011.pdf.

135. MISO's service area extends from the Canadian border, east to Michigan and parts of Indiana, south to northern Missouri, and west to eastern areas of Montana. *See* Jennifer Simon-Lento, *7th Circuit upholds FERC approval of novel cost allocation, questions constitutionality of RPSs favoring in-state generation, and paves the way for renewable-friendly grid expansion projects,* NIXON PEABODY LLP, 1 (June 19, 2013), http://www.nixonpeabody.com/files/157407_Energy_Alert_6_19_13.pdf.

136. Ill. Commerce Comm'n, et al. v. FERC, 721 F.3d 764, 772–73, 781 (7th Cir. 2013) (MISO allocated the costs of the transmission projects among all of the utilities who draw power from the MISO grid in proportion to each utilities' overall volume of usage).

by Professor Ferrey, as authority for its holding to support respective jurisdiction of state and federal government electricity regulation.[137] In *dicta, the decision* declared it unconstitutional for a state to limit another state's renewable portfolio standards to in-state generation because it is a violation of the Commerce Clause: "It trips over an insurmountable constitutional objection. Michigan cannot, without violating the commerce clause of Article I of the Constitution, discriminate against out-of-state renewable energy."[138] Justice Scalia, concurring in the majority prior opinion in *West Lynn Creamery,* submitted that, "subsidies for in-state industry. . . would clearly be invalid under any formulation of the Court's guiding principle" for "dormant" Commerce Clause cases.[139]

The California PUC Division of Ratepayer Advocates criticized the rapid escalation in California ratepayer costs to achieve the RPS mandate.[140] The cost of RPS compliance exceeded the cost of the power itself.[141] The California Division of Ratepayer Advocates reported that the California Public Utilities Commission has approved nearly every renewable contract filed by the utilities, even when they rate poorly on least-cost, best-fit criteria:

> The [California] PUC . . . has greenlighted all but two of 184 green-energy proposals since 2002 . . . .The state Division of Ratepayer Advocates, whose purpose is to represent consumers, concluded in a report last year [2011] that the power contracts the PUC has been approving have put consumers on the hook for $6 billion in excess costs. 'What the commission's practice has been is not to consider the cost of renewable power but to approve every renewable project that came before them,' said Joe Como, acting director of the division. 'We really spent too much money. It's frustrating as hell.'[142]

National Grid estimated the cost of $3.95/month per residential customer to pay for the Massachusetts RPS program, expected to rise by $1/month by 2015.[143] In 2014, Ohio became the first state to freeze its RPS program, negating the annual legislated increase in RPS requirements for two years.[144] The RPS requirement remained but did not advance as originally

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137. *Id.* at 776.

138. *Id.*

139. West Lynn Creamery, Inc. v. Healy, 512 U.S. 186, 208 (1994) (Scalia, J., concurring).

140. Geoffrey Craig, *Renewable Costs of California's Three Big Utilities Soared Last Year, CPUC Data Shows*, ELECTRIC UTIL. WK., Feb. 13, 2012, at 18.

141. *Id.*

142. Evan Halper et al., *Taxpayers, Ratepayers Will Fund California Solar Plants*, L.A. TIMES, Sept. 20, 2012, http://articles.latimes.com/2012/sep/20/local/la-me-bigsolar-20120921.

143. Bruce Mohl, *The Back Story: Green Energy Raising Concerns:* Mandates Account for 5.4% of Monthly Bill, COMMONWEALTH MAG. (Aug. 8, 2013), http://www.commonwealthmagazine.org/Voices/Back-Story/2013/Summer/004-Green-energy-costs-raising-concerns.aspx.

144. Tom Knox, *The Freeze is on—Kasich Signs S.B. 310, Halts Renewable and Energy-Efficiency Standards*, COLUMBUS BUS. FIRST (June 13, 2014), http://www.bizjournals.

legislated. This did not repeal the Ohio RPS program, but retarded its inclining curve of greater renewable energy credit purchase by utilities for two years.

D. State System Benefit Charges

A system benefits charge ("SBC") is a per-kWh power surcharge imposed on all retail electricity consumers within a state utility's service territory through monthly utility bills, which creates an additional state-controlled or state-administered energy fund.[145] These state renewable trust funds distribute money to subsidize various renewable energy resource projects and technologies pursuant to state legislation.[146] Approximately one-third of U.S. states have enacted SBC and "public benefit funds"[147]–seventeen states plus the District of Columbia.[148]

Between 1998 to 2012, 14 states collected approximately $3.5 billion with existing renewable system benefit charges to endow energy trust funds.[149] More than half the amount collected, at least $135 million/year, came from just California. California obtains approximately 30 percent of its power from outside the state.[150] A number of these states, either

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com/columbus/news/2014/06/13/the-freeze-is-on-kasich-signs-s-b-310-halts.html. In June 2014, Ohio enacted Senate Bill 310 to freeze for two years renewable energy and energy efficiency cross-subsidies, making Ohio the first state to back off its RPS. *Id.* As a result, Ohio's renewable energy mandate will remain at 2.5 percent and its energy efficiency standard at 4.2 percent compared to 2009 levels for the next two years. *Id.* A legislative committee will review the standards enacted in 2008, which provide that 25 percent of the electricity sold by Ohio utilities must be generated from alternative energy sources. *Id.* Half of that must come from renewables like wind power, solar must account for at least 0.5 percent of the renewables load, and utilities must slash customers' power usage by 22 percent in the same time frame. *Id.*

145. N.C. Solar Center., *Database of State Incentives for Renewables and Efficiency: Public Benefits Funds for Renewables*, www.dsireusa.org/documents/summarymaps/PBF_Map.pdf.

146. *Id.*

147. ELIZABETH DORIS ET AL., NAT'L. RENEWABLE ENERGY LAB, STATE OF THE STATES 2009: RENEWABLE ENERGY DEVELOPMENT AND THE ROLE OF POLICY 65 (2009), http://www.nrel.gov/docs/fy10osti/46667.pdf.

148. *Id.*

149. M. BOLINGER & R. WISER, LAWRENCE BERKELEY NAT'L LAB., THE IMPACT OF STATE CLEAN ENERGY FUND SUPPORT FOR UTILITY-SCALE RENEWABLE PROJECTS, (Clean EnergyStates Alliance2006), http:// eetd.lbl.gov/ea/ems/cases/lbnl-56422.pdf.

150. World Nuclear Assoc., California Electricity, updated August 2014 ("California Energy Commission (CEC) data for 2008 shows in-state generation of 208.5 billion kWh and net imports of 98 billion kWh to give total of 306.5 TWh, 14.44% of this nuclear,

explicitly or as a matter of practice, will only fund sustainable energy projects within their own states, even though power from all sources inside and outside the states are taxed to create the SBC fund. The Illinois legislature decided its program would "develop[] new renewable energy resources and clean coal technologies for use in Illinois [for distributing these funds]" and "[t]he criteria should promote the goal of fostering investment in and the development and use, *in Illinois*, of renewable energy resources."[151] However, the effectuation of the desire to retain subsidy funds for in-state benefit raises the dormant Commerce Clause constitutional issue of discriminating against commerce in out-of-state electricity.[152]

E. State Climate Control

In the absence of federal climate change legislation in the United States, originally ten, and now nine, eastern states have combined into the Regional Greenhouse Gas Initiative ("RGGI") to regulate carbon dioxide ("CO_2") emitted from their larger power plants.[153] Additionally, California has comprehensive regulation of all greenhouse gases ("GHGs") from all sources,[154] and other western[155] and midwestern[156] states initiated—but since postponed or abandoned—global warming gas regulation.

18.21% coal, 45.74% natural gas, 11.0% large hydro and 10.61% other renewables.), *available at* http://www.world-nuclear.org/info/Country-Profiles/Others/California-s-Electricity/.

151. 20 ILL. COMP. STAT. § 687/6–3(b) (2008) (emphasis added); *see also id.* at § 687/6–4(b).

152. *See, e.g.*, Ferrey, *Follow the Money!*, *supra* note 62; *see also* Ferrey, *Constitutional Barriers*, *supra* note 62; Steven Ferrey, *Renewable Orphans: Adopting Legal Renewable Standards at the State Level*, 19 ELECTRICITY J. 52 (March 2006).

153. *See* Regional Greenhouse Gas Initiative, Inc., http://www.rggi.org/rggi (listing participating states); New Jersey recently withdrew, and other states have considered withdrawal from this cap-and-trade program. Angela Delli Santi & Beth DeFalco, *New Jersey Withdrawing from Regional Greenhouse Gas Program*, CBS CONN., May 26, 2011, http://connecticut.cbslocal.com/2011/05/26/42273.

154. Cal. Health & Safety Code §§ 38500–38599 (Deering 2010). The California carbon scheme requires that California reduce GHG emissions to 1990 levels by 2020, considering all in-state and out-of-state generation used to serve California electric load. *Id.* § 38550.

155. *History*, WESTERN CLIMATE INITIATIVE, http://www.westernclimateinitiative.org/history; FERREY, LAW OF INDEPENDENT POWER, *supra* note 40, § 6:9. Six of the seven states withdrew in 2011, "leaving California alone in this now-unitary consortium, along with the four observing Canadian provinces." *Id.*

156. Nora Macaluso, *Midwest States to Commence Work on Details of Regional Climate Strategy*, BNA ENVTL. REP., Nov. 30, 2007, at 2. The three states of Indiana, Ohio, and South Dakota opted out of this scheme and were observers; Dean Scott, *Midwestern States to Draw Up Model Rule By End of 2008 to Implement Cap-and-Trade*, BNA ENVTL. REP., Feb. 22, 2008, at 1.

RGGI[157] and California's A.B. 32 carbon regulation program[158] both adopted 'cap-and-trade' programs. RGGI regulates only CO_2 emissions from power plants larger than 25 mW.[159] California's A.B. 32 regulates all carbon emissions from all major industries in the state.[160] RGGI is more limited than California in covered entities and industries, the kinds of GHGs emissions controlled, and the amount of emissions targeted and controlled.[161]

Laws that attempt to arrest leakage around the edges of state-limited programs, by regulating the conduct of out-of-state businesses, violate the Commerce Clause.[162] These laws can assume the form of added taxes and charges on out-of-state goods.[163] States are prohibited from attaching restrictions to any goods that they import from other states.[164] States cannot regulate in ways where the practical effect is to control conduct in other states.[165]

Where a state statute provided a tax exemption for sales of two types of wine—both produced from products produced in the state—even though not required to mention the state by name, the effect was practically state-specific discrimination, and it was found to be discriminatory, and a violation of the Dormant Commerce Clause.[166] A state cannot regulate to favor, or require the use of, its own in-state energy resources even for a

157. RGGI, *Memorandum of Understanding* (Dec. 20, 2005), http://www.rggi.org/agreement.htm.

158. Cal. Health & Safety Code § 38501 (Deering 2007).

159. Reg'l Greenhouse Gas Initiative, *Goals, Proposed Tasks, Short-Term Action Items* (2003), http://www.rggi.org/docs/actionplanfinal.pdf.

160. *See* Assembly Bill 32 Overview, CALIFORNIA AIR RESOURCES BOARD, http://www.arb.ca.gov/cc/ab32/ab32.htm.

161. *See* Appendix J Allowance Allocation, *available at* http://www.arb.ca.gov/regact/2010/capandtrade10/capv4appj.pdf; Regional Greenhouse Gas Initiative, Regional Greenhouse Gas Initiative Model Rule, *available at* http://www.rggi.org/docs/Model%20Rule%20Revised%2012.31.08.pdf.

162. *See, e.g.,* Healy v. Beer Inst., 491 U.S. 324, 326–27, 343 (1989) [hereinafter *Healy*] (striking requirement that the price of beer was not higher than that charged out-of-state).

163. *See, e.g.*, Chem. Waste Mgmt. Inc. v. Hunt, 504 U.S. 334, 336–37 (1992) (invalidating an Alabama law imposing an extra fee on imported hazardous waste).

164. C & A Carbone, Inc. v. Town of Clarkstown, N.Y., 511 U.S. 383, 393 (1994) [hereinafter *Carbone*] ("States and localities may not attach restrictions to . . . imports in order to control commerce in other States").

165. *Healy*, 491 U.S. at 336; *Carbone*, 511 U.S. at 393.

166. Bacchus Imports Ltd. v. Dias, 468 U.S. 263 (1984); *see also Carbone*, 511 U.S. at 393.

small percentage of total use,[167] nor can it, by regulation, harbor energy-related resources originating in the state.[168] A state cannot require usage of in-state fuels even for the rationale to satisfy federal Clean Air Act requirements.[169] Income tax credits cannot be given by a state only to in-state producers of fuel additives.[170]

The Supreme Court consistently has required that the regulation of power by the states must not discriminate based on the origin of power or the ultimate impact which may discourage its flow in interstate commerce.[171] Recent federal court opinions construing state electric regulation have scrupulously followed this doctrine.[172]

F. Legal Conclusion

States, including California, employ five techniques, any of which can or cannot create a barrier to traditional utility cash flow. The predominate focal point has been net energy metering, employed in 86% of the states, and renewable portfolio standards, employed in 60% of the states.[173] Both of these state enactments cause the typical customer unknowingly to cross-subsidize certain other customers who are diverging from the traditional utility model of centralized electric power supply. Utilities are ordered by state regulators to be the agents of this change, and in most states the costs of these significant cross-subsidies are not revealed on the customers' bills, as is the breakdown of the other detailed components of electricity cost (the power commodity, transmission, distribution, stranded costs, etc.).[174] FiTs are unconstitutional when adopted by U.S. states for

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167. Wyoming v. Oklahoma, 502 U.S. 437, 454–56 (1992). The Oklahoma statute overturned involved only a 10% allocation of the market to in-state producers. As a result of the statute, the market changed in response from use of almost all out-of-state coal to "the utilities purchased [in-state] Oklahoma coal in amounts ranging from 3.4% to 7.4% of their annual needs, with a necessarily corresponding reduction in purchases of Wyoming coal."; *see also* Alliance for Clean Coal v. Craig, 840 F. Supp. 554, 560 (N.D. Ill. 1993).

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

169. Alliance for Clean Coal v. Miller, 44 F.3d 591, 596-97 (7th Cir. 1995).

170. New Energy Co. of Indiana v. Limbach, 486 U.S. 269, 271, 278–80 (1988).

171. New England Power Co., 455 U.S. at 331 (overturning as a violation of the dormant Commerce Clause an order of the state Public Utilities Commission that restrained within the state for the financial advantage of in-state ratepayers, renewable power produced within the state).

172. *See* Entergy Nuclear Vermont Yankee, LLC et. al. v. Shumlin, 733 F.3d 393, 431 (2nd Cir. 2013).

173. *See* FERREY, THE LAW OF INDEPENDENT POWER, *supra* note 55; *see supra* note 56.

174. *See, e.g.*, NSTAR monthly bill (on file with author).

their regulated investor-owned utilities,[175] and net metering[176] and RPS[177] have attracted recent constitutional scrutiny.

Conflict is thus inevitable. There has been litigation regarding the five regulatory techniques around the traditional model:

- One of these five state initiatives, FiTs, has been stricken as illegal/unconstitutional.[178]
- A second of these five initiatives, renewable portfolio standards, is unconstitutional in the method that some states have implemented it and in mid-2013 was declared by the federal Court of Appeals to be unconstitutional.[179]
- A third of these five initiatives, system benefit charges, as implemented in some states, is at least *de jure* constitutionally questionable on its face.[180]
- A recent federal adjudicatory order casts uncertainty on a fourth of these five initiatives, net metering.[181]
- The fifth of these five state initiatives, carbon regulation, has at least one state withdrawing participation due to a perceived lack of benefit given the cost to power consumers,[182] and California's program has lost some law suits against it which have proceeded to a decision on the merits.[183]
- A 2014 decision of the federal court in Minnesota holding clearly unconstitutional a Minnesota statute which banned the import of foreign coal or new facility coal-produced power into Minnesota for power generation or the construction of new plants which would burn coal from out of state, prohibited any new power purchase agreements for power produced by out-of-state coal-burning plants and raised the

175. *See* Gipe, *supra* note 63.
176. *In re Riggs*, 138 FERC 61,172 (2012); Esther Whieldon, *FERC Declines Enforcement Action on Rhode Island Ratepayers PURPA Complaint*, INSIDE FERC, Mar. 19, 2012, at 4.
177. *See, e.g.*, Ill. Commerce Comm'n, et al. v. Fed. Energy Reg. Comm., 721 F.3d 764 (2013).
178. Cal. Public Utils. Comm'n et al., 132 FERC ¶¶ 61,047, 61,339 (2010) (Order on Petitions for Declaratory Order).
179. *See supra* note 176.
180. *See supra* note 153.
181. Sun Edison, 129 FERC ¶ 61,146, para. 18 (Nov. 19, 2009) (declaratory order).
182. *See infra* at Section E.
183. *See infra* note 213.

cost of future purchases of coal power by assigning environmental costs to use of the fuel.[184]

- There was a successful suit by Transcanada alleging that Massachusetts renewable energy tradable credits under capped incentives violated the Dormant Commerce Clause of the U.S. Constitution[185] by limiting eligible solar Renewable Energy Credits as well as issuing long-term power purchase contracts only to Massachusetts companies.[186] After stating that it had confidence in its position, Massachusetts immediately settled the litigation so as to avoid a court decision, providing that TransCanada would be eligible for these programs.[187]
- A challenge to the California LCFS rule as violating the Dormant Commerce Clause of the Constitution[188] was successful in federal district court for the Eastern District of California, finding that it "discriminates against out-of-state corn-derived ethanol while favoring in-state corn ethanol and impermissibly regulates extraterritorial conduct."[189] The Court held that the LCFS rule differentiates based on place of origin of the commerce and concluded that the LCFS discriminates on its face against out-of-state corn-derived ethanol[190] may not impose a barrier to interstate commerce based on the distance that the product must travel in interstate commerce."[191] The Ninth Circuit reversed the trial court finding of unconstitutionality in a

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184. North Dakota v. Heydinger, D. Minn., No., 15 F. Supp. 3d 891 (D. Minn. Apr. 18, 2014); Minn. Stat. § 216B.1694, subd. 1 (2008); In the Matter of the Application of Otter Tail Power Company and Others for the Certification of Transmission Facilities in W. Minn., 2009 Minn. PUC LEXIS 6 (Mar. 17, 2009); In the Matter of Great River Energy's 2008 Resource Plan; In in the Matter of Great River Energy's Proposed Carbon Offset, 2010 Minn. PUC LEXIS 458 (Dec. 3, 2010).

185. Complaint, Transcanada Power Mktg., Ltd. v. Bowles, et al., No. 4:10-cv-40070 (D. Mass. Apr. 16, 2010), *available at* http://www.ohiogreenstrategies.com/documents/transcanada.pdf; E. Ailworth, *State looking to settle suit over law on clean energy*, BOSTON GLOBE, May 27, 2010, *available at* http://www.boston.com/business/articles/2010/05/27/lawsuit_hits_mass_law_promoting_local_energy_providers/.

186. *Id.*

187. *See* Partial Settlement Agreement, TransCanada Power Marketing Ltd. v. Bowles et al., No. 10-cv-40070 (D. Mass. Jun. 6, 2010), http://www.mass.gov/eea/docs/doer/renewables/solar/settlement-agreement.pdf.

188. Rocky Mountain Farmers Union v. Goldstene, 843 F. Supp. 2d 1071, 1081 (E.D. Cal. 2011).

189. *Id.* at 1081.

190. *Id.* at 1087.

191. *Id.* at 1089.

> split decision with a dissent. A petition for a rehearing en banc was denied, with members of the Ninth Circuit dissenting from that denial noting that "California—could under the majority's reasoning—penalize out-of-state wineries to account for the environmental effects of transporting their wines to California."[192]

There has been recent litigation in major states, including New Jersey, Maryland, and Vermont in federal courts, affirmed in all cases by the Second, Third, and Fourth Circuit Courts of Appeals, which found preempted state electric power regulation[193]:

- A successful constitutional challenge by conventional power generators to New Jersey's in-state energy facility preferences;[194]
- A successful constitutional challenge by conventional power generators to Maryland's in-state energy facility preferences;[195]

192. Rocky Mountain Farmers Union v. Corey, 740 F.3d 507, 518 (9th Cir. 2014). A petition for a rehearing en banc was denied, with members of the Ninth Circuit dissenting from that denial noting that "California—could under the majority's reasoning—penalize out-of-state wineries to account for the environmental effects of transporting their wines to California."

193. For an article concluding that the Maryland RPS program and others that similarly facially discriminate against interstate commerce are likely unconstitutional in violation of the dormant Commerce Clause, see Anne Hayemann, Note, *Surviving the Commerce Clause: How Maryland Can Square Its Renewable Energy Laws with the Federal Constitution*, 71 MD. L. REV. 848, 851 (2012); Entergy Nuclear Vermont, L.L.C. v. Shumlin, 733 F.3d 393, 393 (2d Cir. 2013); Norris v. Lumbermen's Mut. Cas. Co., 881 F.2d 1144, 1150 (1st Cir. 1989).

194. *See* PPL Energyplus v. Hanna, 997 F. Supp. 2d 372 (D. N.J. 2013), *aff'd*, PPL Energyplus v. Solomon, 766 F.3d 241 (3rd Cir. 2014) (field preemption on wholesale power prices and rates and finding the New Jersey regulation a violation of the Constitution's Supremacy Clause); PJM Interconnection, 135 FERC ¶ 61,022 (2011). In 2011, New Jersey enacted legislation to encourage the acquisition by utilities of the output of 2000 Mw of new in-state power projects. Mary Powers, *PJM Generators File Complaint with FERC Seeking Relief from NJ In-state Generation Law*, ELECTRIC UTIL. WK., Feb. 7, 2011, at 11; Hannah Northey, *Utilities Challenge N.J. Law While Preparing to Reap Its Benefits*, ENVTL. & ENERGY PUBLICATION, LLC (Mar. 2, 2011), http://www.eenews.net/stories/1059945886; Powers, *supra* note 197, at 11, 13.

195. *See* PPL Energyplus v. Nazarian, 974 F. Supp. 2d 790 (D. Md. Sept. 30, 2013), *aff'd*, 753 F.3d 476 (4th Cir. 2014) (field preemption and conflict preemption on wholesale power prices and finding the Maryland regulation a violation of the Constitution's Supremacy Clause).

- Vermont's attempt to discriminate against and control the sale of interstate power generated in its state.[196]

In 2013, the Supreme Court,[197] the federal circuit courts of appeals,[198] federal trial courts,[199] plus FERC,[200] confronted seven specific federal cases alleging states in regulating energy violated the Supremacy Clause and/or the Commerce Clause of the Constitution. At either the trial or appellate court levels, the states have lost each of these on a significant legal claim of petitioners. Of note, state losses on constitutional grounds can result in challengers' attorneys' fees being shifted to state taxpayers.[201] Where states have prevailed, it is often by raising procedural defenses of standing, ripeness, redressability, concreteness, mootness, or justiciability, to avoid having to defend their statutes on the merits and substantive law.

All objects of interstate trade merit Commerce Clause protection, which include electric energy in interstate commerce:[202]

> [I]t 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.[203]

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196. Entergy Nuclear Vt. Yankee v. Shumlin, 838 F. Supp. 2d. 183, 236 (D. Vt. 2012), *aff'd in part*, *rev'd in part*, 733 F.3d 393 (2nd Cir. 2013). The trial court found the regulation unconstitutional and issued an injunction "enjoin[ing] Defendants from conditioning Vermont Yankee's continued operation on the existence of a below-market PPA with Vermont utilities." *Id.* at 239.

197. American Trucking Ass'ns v. Los Angeles, 133 S. Ct. 927 (2013); City of Arlington, Texas, et al. v. Federal Communications Commission et al, 133 S. Ct. 1863 (May 20, 2013).

198. Entergy Nuclear Vt. Yankee v. Shumlin, 733 F.3d 393 (2nd Cir. 2013); Ill. Commerce Comm'n v. Federal Regulatory Commission, 721 F.3d 764 (7th Cir. 2013; Rocky Mountain Farmers Union v. Corey, 730 F.3d 1070 (9th Cir. 2013).

199. Entergy Nuclear Vt. Yankee v. Shumlin, 838 F. Supp. 2d 183, 233 (D. Vt. 2012); Rocky Mountain Farmers Union v. Goldstene, 843 F. Supp. 2d. 1071, 1099 (E.D Cal. 2011); PPl Energyplus v. Nazarian, 974 F. Supp. 3d. 790 (D. Md. Sept. 30, 2013), *aff'd*, 753 F.3d 467 (4th Cir. 2014) (field preemption and conflict preemption on wholesale power prices); PPL Energyplus v. Hanna, 977 F. Supp. 2d 372 (D. N.J. 2013), *aff'd*, PPL Energyplus, LLC, et al, v. Solomon, 766 F.3d 241 (3rd Cir. 2014) (field preemption on wholesale power prices and rates).

200. *Supra* note 178, at 61,337–38.

201. In the New Jersey case, the plaintiffs were allowed to submit an application for the state to cover their legal fees. PPL Energy Plus v. Solomon 2011 WL 5007972 (D. N.J. 2011). Scheduling Order, entered Oct. 18, 2013. Similarly in the Maryland case and the Entergy case, application for attorneys fees were granted; PPL Energy Plus v. Hanna, 977 F. Supp. 2d 372 (D. N.J. 2013); Entergy Nuclear Vt. Yankee v. Shumlin, 838 F. Supp. 2d. 183, 233 (D. Vt. 2013).

202. *See* New York v. FERC, 535 U.S. 1, 22 (2002) ("[T]ransmissions on the interconnected national grids constitute transmissions in interstate commerce.").

203. FERC v. Mississippi, 456 U.S. 742, 757 (1982).

The U.S. Supreme Court held that Congress meant to draw a "bright line," easily ascertained and not requiring case-by-case analysis, between state and federal jurisdiction.[204] California, in 2011, lost its case attempting to defend its state FiTs for renewable power.[205] Much power generation, and particularly new wind and solar facilities, are not owned by the retail utilities that deliver power to retail customers, but instead are owned by independent wholesale market participants in California and on the east coast.[206] The amount of power wholesaled before it is sold at retail has shifted from only 8% in the 1960s to a majority today.[207] As noted by the federal courts and affirmed by the Supreme Court, these independent market participants are the new competitive reality in power and energy markets:[208]

> When combined with federal preemption law, one crucial result of these energy market regulatory reforms has been 'a massive shift in regulatory jurisdiction from the states to FERC.' . . . The upshot of these federal and state innovations in electricity regulation is that state regulators, despite their continued authority over rates charged directly to consumers, have much less actual authority over those rates than they did [earlier].[209]

Electricity moving constantly in interstate commerce virtually at the speed of light,[210] raises issues that the states have not best handled:

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204. Fed. Power Comm'n v. S. Cal. Edison Co., 376 U.S. 205, 215–16 (1964).

205. CAL. PUB. UTIL. COMM'N, 132 FERC ¶ 61,047 (2010).

206. *See* Steven Ferrey, *Sale of Electricity*, THE LAW OF CLEAN ENERGY: EFFICIENCY AND RENEWABLES 217, 217–18 (Michael B. Gerrard ed., 2011) [hereinafter *Sale of Electricity*]. This spun generation assets, including nuclear generation, out into independent ownership not subject to state regulation. *See id*; The costs of these independent wholesale power entities are not recovered through state-regulated retail rates, but rather through wholesale rates subject to FERC's exclusive jurisdiction. *See id*; Relevant to the area in which this facility operates, *see* ISO-NE 2013 GIS Load Asset Listing, (Jan. 11, 2015, 2:43 PM), http://www.iso-ne.com/markets-operations/settlements/gis.

207. *See* STEVEN FERREY, THE NEW RULES 10–11 (2000) [hereinafter THE NEW RULES]; FERREY, ENVIRONMENTAL LAW, *supra* note 42, at 587.

208. *See* FERREY, THE NEW RULES, *supra* note 207, at 269–70.

209. Pub. Util. Dist. No. 1 of Snohomish Cnty. Wash. v. FERC, 471 F.3d 1053, 1066–67 (9th Cir. 2006), *aff'd in part* and *rev'd in part sub nom, vacated* 547 F.3d 1081 (2008); *see* Morgan Stanley Capital Group, Inc. v. Public Utility District No. 1, 554 U.S. 527 (2008); *see also* Entergy Nuclear Vermont Yankee, LLC v. Shumlin, 733 F.3d 393 (2d Cir 2013).

210. *See* STEVEN FERREY, LAW OF INDEPENDENT POWER § 2:1 (36th ed. 2015); Steven Ferrey, *Inverting Choice of Law in the Wired Universe: Thermodynamic, Mass, and Energy,* 45 WM. & MARY L. REV. 1839, 1914 (2004).

- California in 2011 lost a suit on its carbon control cap-and-trade regulation, resulting in an additional year of delay in the program until 2013 while it made revisions.[211]
- There was a successful suit in 2009 against New York's RGGI carbon regulation.[212]
- An additional suit against New York's participation in RGGI was deflected only by procedural defenses.[213]
- Arizona in late 2013 imposed an additional fee of approximately $5/month on solar installations.[214]
- In a case distinct from a somewhat similar suit on the merits by other parties under constitutional principles in federal court, the largest ethanol producer in the United States successfully challenged the California Low Carbon Fuel Standard (LCFS) rule in California state court, alleging a failure to comply with the California Environmental Quality Act.[215]

There are many legal fences ringing state methods of implementation of incentives, which influence, at least indirectly, new energy sector business models.

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211. Ass'n of Irritated Residents v. Cal. Air Res. Bd., No. CPF-09-509562, 2011 WL 312702 (Cal. Super. Ct. Jan. 24, 2011) (tentative statement of decision); Lisa Weinzimer & Geoffrey Craig, *Delaying California CHG Cap-and-Trade Regime a Year Draws Support from Stakeholders*, ELECTRIC UTIL. WK., July 4, 2011, at 11–12, *available at* 2011 WLNR 14216421; Joshua T. Bledsoe, *California Cap and Trade Back on Track, but Compliance Obligations Pushed from 2012 to 2013*, LATHAM'S CLEAN ENERGY L. REP. (Jul. 8, 2011), http://www.cleanenergylawreport.com/environmental-and-approvals/california-cap-and-trade-back-on-track-but-compliance-obligations-pushed-from-2012-to-2013/. This delayed the plan until 2013. *Id.*

212. *See Indeck Energy Sues State Questioning Legality of Regional Greenhouse Gas Program*, CLEAN TECH. BUS. REV. (Jan 11, 2015), http://solar.clean technology-businessreview.com/news/indeck_energy_sues_state_questioning_legality_of_regional_greenhouse_gas_program_090129; *see* Consent Decree, Indeck Corinth, L.P. v. David Paterson, No. 5280-09, at 5–6 (Sup. Ct. NY Cnty. Albany Dec. 17, 2009), *available at* http://www.dec.ny.gov/ docs/legal_protection_pdf/consdecree.pdf.

213. *Thrun v. Cuomo, et al*, No. 4358-11, 42 ELR 20132, (N.Y. Sup. Ct. 2012); Geoffrey Craig & Gail Roberts, *Lawsuit Disputes Legality of New York Participation in RGGI, Citing Lack of Legislative Approval*, ELECTRIC UTIL. WK., July 4, 2011, at 10, *available at* 2011 WLNR 14216406.

214. Craig & Roberts, *supra* note 213. Arizona Public Service originally sought an amount ten times this amount. *Id.*

215. Poet, LLC v. California Air Resources Board, 218 Cal. App. 4th 681 (2013); Poet argued that CARB failed to respond to numerous public comments, that it omitted documents from the rulemaking file. *Id.* at 745.

IV. THE BENEFITS OF DISTRIBUTED GENERATION AND THE LAW

The grid is changing. An increasing percentage of consumers will generate their own power. The motivation for this is more a "regulatory play" than it is based on generation cost economics. This is because self-generation of power, even if not economic on generation costs compared to larger facilities (smaller fossil-fired units typically have greater environmental impacts per kWh generated), achieves double avoidances of regulatory imposed costs:

- The generator avoids all transmission, distribution, system benefit charge, and tax costs in the retail bill for the amount generated, which avoided fractions collectively typically constitute more than half of the retail bill.
- The generator can receive a suite of cross-subsidies in the form of RECs, net metering credit value, system benefit charges, carbon credits; in Massachusetts, as one example, these are collectively worth up to 1000% more than the value of power produced itself.

Additional deployment of renewable energy resources has measureable significant positive public externalities:

- Increasing power system reliability with more independent points of generation.[216]
- Creating a reliable and appropriately more mixed generation supply diversity for the electric power system.[217]
- Putting less pressure on the use of the aging power distribution system by utilizing on-site private power rather than moving more power through the regulated power distribution system.[218]
- Using solar PV systems that can add on-peak value to the power transmission network with which they interconnect by providing supply to proximately located end users,[219]

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216. *See Distributed Energy Basics*, DEMOCRATIC UNDERGROUND (Jul. 6, 2013), http://www.democraticunderground.com/112748526.
217. *Id.*
218. *See* Edward Kahn, *Avoidable Transmission Cost Is a Substantial Benefit of Solar PV*, 21 ELECTRICITY J. 41, 45 (2008).
219. *Id.*

although this is dependent on a case-by-case locational determination of power flow.[220]

Some scholars have estimated that the value of distributed solar PV units that sell power back to the grid results in savings to the utility system due to not purchasing that amount of power elsewhere, saving use of transmission and distribution capacity, eliminating risk of changes in fossil fuel prices, and saving transmission and distribution losses of 5% to 10% in transmission—which they valued cumulatively at between $0.09 and $0.25 per kWh.[221] In addition to these values to the utility system, articles note that there are other societal benefits in environmental and health benefits, jobs, and grid security, which increase the cumulative total by approximately 50%.[222] When combined with power sale revenues, the total value of solar PV benefits has been estimated to be higher than the leveled cost to install PV (e.g. $0.15 to $0.41/kWh in the U.S.).[223] If that is true, PV system owners actually cross-subsidize other ratepayers.[224] But there is, as yet, no definitive calculation of costs and benefits for a particular utility in a particular state. Subsidies for distributed generation have been randomly afforded in many states without quantifying costs and benefits to the grid.

There also are real costs associated with necessary greater amounts of spinning reserve and back-up power, which impose additional costs on maintenance of system reliability that were not there before.[225] Satisfying the California goal of having 33**%** of electricity supplied by renewable resources by 2020 will cost approximately $115 billion as estimated by

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220. *See* Tom Tiernan, *Attention to Good Standby Rates Seen Key as Distributed Generation Plays Bigger Role*, ELECTRIC UTIL. WK., Dec. 31, 2012, at 10, *available at* https://global.factiva.com. While increased solar PV installations sited near load centers can defer substation and grid system investments, they can increase two-way power flows and add grid management costs for voltage fluctuations and equipment overload. *Id.*

221. Richard Perez et al., *Solar Power Generation in the U.S.: Too Expensive, or a Bargain?*, 39 ENERGY POL'Y 7290, 7294 (2011). The range of value that this Article attaches to wholesale power is significantly above the average weighted price of wholesale power transactions in the last several years and uses the distributed power value in New York City, a location that is capacity constrained. *See* FERREY, LAW OF INDEPENDENT POWER, *supra* note 210, § 10:144.

222. *See* Perez, *supra* note 222, at 7293–94.

223. Rickerson, IEA, *supra* note 2, at 43 (citing Richard Perez et al., *Solar Power Generation in the US: Too Expensive, or a Bargain?*, 39 ENERGY POL'Y 7290, 7294 (2011)); LENA HANSEN ET AL., ROCKY MOUNTAIN INST., A REVIEW OF SOLAR PV BENEFIT & COST STUDIES 22 (2d ed. 2013).

224. *See* Rickerson, *supra* note 2, at 43; L. BIRD ET AL., NAT'L RENEWABLE ENERGY LAB, REGULATORY CONSIDERATIONS ASSOCIATED WITH THE EXPANDED ADOPTION OF DISTRIBUTED SOLAR (2013).

225. *See* Puga, *supra* note 49, at 34–35.

the California PUC. According to PUC member, John Bohn, there should be more honesty about these facts and costs.[226]An article questioned the taxpayer and ratepayer subsidies concealed within California's push for a quick ramp-up of solar energy generation.

Stanford University economist Frank Wolak, an expert in the California electricity market, said the state's renewable energy strategy could boost electricity rates 10% to 20%, depending on a number of factors. Potentially, consumers' bills could go up by 50%: "It is easily in the billions of dollars," he said.

Even renewable-energy advocates, such as the Bay Area-based Climate Policy Initiative, estimates that 43 cents of every dollar of energy produced by the Ivanpah facility will be paid for by taxpayers. But outside experts, including Wolak, the Stanford economist, estimate that Ivanpah power is priced at $90 to $130 per megawatt hour—three to four times the cost of electricity in the state last year. A San Diego-based power consultant estimated the cost of new transmission lines to reach remote solar and wind power plants could exceed $15 billion statewide in the next decade. Upgrading existing transmission lines would add billions more, he said.[227]

In the U.S. electric power system, the costs of state wholesale power generation incentives are not absorbed by the utilities, but are passed on to their customer rate-payers, often through pre-approved adjustment clauses. There was a first-of-its-kind recent Ohio action, which froze rather than advanced renewable goals.[228] The President of NRG Energy noted that more distributed solar and wind power is forcing utilities to spread their increasing fixed costs over fewer customers, therefore increasing the cost of service to remaining customers.[229]

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226. Lisa Weinzimmer & Lynn Corum, *California Challenge Looks Bigger and Bigger as Budget, Economy Woes Strain High Ambitions*, ELECTRIC UTIL. WK., Jan. 18, 2010, at 1, 20.

227. Evan Halper et al., *Taxpayers, Ratepayers Will Fund California Solar Plants*, L.A. TIMES, Sept. 22, 2012 ("Taxpayers, ratepayers will fund California solar plants: A new breed of prospectors—banks, insurers, utility companies—are receiving billions in subsidies while taxpayer and ratepayers are paying most of the costs. Critics say it's a rip-off.").

228. Two states were attempting to expand definitions to include more eligible project, as did Massachusetts previously.

229. Andrew Engblom, *NRG CEO: Distributed Generation a 'Mortal Threat to Utilities*, SNL ENERGY, Mar. 22, 2013.

And consumers are often confronted with the lack of competitive choices: In more than two-thirds of the states, there is no alternative for all retail power consumers other than a monopoly utility company, resulting in the consumer incurring any invisible additional costs associated with state incentive mechanisms previously bulleted above.[230] The California PUC documented that most homeowners with distributed solar systems had an average household income about twice that as the average household.[231] California preserved net metering for now, but directed the state's Public Utility Commission to come up with a new program by 2017 that ensures non-solar customers do not bear an unfair burden.[232]

In addition to consumer cross-subsidies, there is an additional cost to the grid system of accommodating substantially more net metered intermittent power. Adding a significant intermittent DG component, even if load demand characteristics do not change, increases the need for spinning reserve, the amount of fuel consumed to spin that reserve, and other marginal costs incurred to maintain an unchanged, reliable system.[233]

So we need to do the numbers to move forward on what trade-offs surround the new business model. The Natural Resources Defense Council (NRDC) and the Edison Electric Industry (an electric utility industry trade group), in 2014, jointly called for a new state retail rate structure to reflect more equitable prices based on actual costs and benefits for distributed renewable energy systems.[234] The groups jointly stated that "rate designs will continue to develop that reward customers for using electricity more efficiently," and an NRDC official stated that owners of rooftop solar panels "must provide reasonable cost-based compensation for the utility services they use."[235] Julia Hamm of the Solar Electric Power Association identifies three ways regulators could help utilities cope with these changes:[236]

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230. *See* Retail Energy Supply Association, *State by State*, http://www.resausa.org/states (showing that thirty-six states still maintain monopolies on the sale of electric power).

231. Than, *supra* note 6 ($91,000 as compared to California's state average of $54,000).

232. *Id.*

233. *See* Puga, *supra* note 49.

234. EEI/NRDC Joint Statement To State Utility Regulators, Feb. 12, 2014, http://docs.nrdc.org/energy/files/ene_14021101a.pdf; Christopher Martin, *NRDC, Utility Group Urge Grid Payments, New Rate Structure for Rooftop Solar Users*, BLOOMBERG BNA ENERGY AND CLIMATE REPORT, Feb. 12, 2014, http://www.bloomberg.com/news/2014-02-12/nrdc-and-u-s-utilities-seek-compensation-for-rooftop-solar-cost.html.

235. *See* Martin, *supra* note 234.

236. Ronald Lehr, *New Utility Business Models: Utility and Regulatory Models for the New Era*, ELECTRICITY J., Oct. 2013, at 35.

- They could demand monthly infrastructure fees from solar users, as some are now doing (to compensate for a base amount of grid benefit afforded).
- They could itemize a la carte every component of value separately, rather than wrapping the cost of infrastructure maintenance into usage charges, and disaggregate which customers consume which features.
- They could split energy used and consumed into separate transactions so that all DG energy is sold to a utility before buying back what's needed (as is done with gross net metering).

A value of solar tariff has previously been developed by the municipal utility in Austin, Texas, for residential PV.[237] We need to do the cost/ benefit analysis and under law reconfigure the new model and its economics accordingly.

237. Karl R. Rábago et al., *Designing Austin Energy's Solar Tariff Using a Distributed PV Value Calculator* 5 (2012) (presented at World Renewable Energy Congress).