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Your Local Solar Panel Store: Developing State Laws to Encourage Third-Party Power Purchase Agreements and Distributed Generation

Sam D. Bolstad

Note

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On April 12, 2012, the Iowa Utilities Board told Barry Shear, President of Eagle Point Solar,[1] that Eagle Point would be operating as an unlicensed public utility if it sold the electricity generated by solar panels it installed on City of Dubuque buildings to the city.[2] Mr. Shear and his company were therefore prohibited from doing so.[3] The Board based its decision on the fact that the utility company Interstate Power and Light had exclusive electric utility service rights in that territory.[4] Eagle Point petitioned for judicial review, and the Iowa District Court for Polk County reversed the Board's ruling, reasoning that Eagle Point Solar was simply providing a form of energy efficiency by reducing the City of Dubuque's demand for purchasing electricity from the utility company.[5] The case went to

* J.D. Candidate 2015, University of Minnesota Law School; B.A. 2012, University of Wisconsin–Madison. Many thanks to Professor Alexandra Klass for her insight and guidance on the drafting process and the complexities of energy law. Thank you to Richard Heinemann of Boardman & Clark LLP for sparking my interest in third-party power purchase agreements. Special thanks to the board and staff of the *Minnesota Law Review*, who have been a wonderful community of colleagues and friends. My utmost gratitude and love to my family, Paul, Sheryl, Holly, and Brittany, for their love and support.

1. *Our Staff*, EAGLE POINT SOLAR, http://www.eaglepointsolar.com/about-us/staff.html (last visited Nov. 4, 2014).

2. *See* SZ Enters., LLC, Docket No. DRU-2012-0001, at 17 (State of Iowa Dep't of Commerce Utils. Bd. Apr. 12, 2012) (declaratory ruling), https://efs.iowa.gov/cs/groups/external/documents/docket/mdaw/mtmy/~edisp/101261.pdf.

3. *Id.*

4. *Id.*

5. SZ Enters., LLC v. Iowa Utils. Bd., Case No. CVCV009166, at 14, 24 (Iowa Dist. Ct. Polk County Mar. 29, 2013), http://www

the Iowa Supreme Court, which agreed with the district court and held that Eagle Point could sell the City the electricity generated from the solar panels.[6] The entire process took more than two years to litigate.

Solar panel companies around much of the United States face the same legal uncertainty that Eagle Point Solar confronted over the past several years. Much of energy regulation has been left to the states, and in over half of them it remains unclear whether solar panel companies can sell electricity under the same model as Eagle Point Solar, known as a third-party power purchase agreement (PPA).[7] Under the third-party PPA model, interested consumers, whether they be residential homeowners, businesses, or municipalities, do not bear the burden of the steep upfront capital costs associated with purchasing and installing solar panel facilities; instead, the solar panel company shoulders this cost when it installs the solar panel facility on-site at the consumer's location.[8] The solar panel company then recoups the money by selling the electricity produced by the panels to the consumer.[9]

Because the consumer's demand for electricity is met by the solar panel company, this takes business away from electric utilities, which in many states have exclusive jurisdiction over a given service territory. In those states that have not legislated on third-party PPAs, solar panel companies face legal uncertainty as to whether they are operating as an unlicensed electric utility in violation of a state's laws or regulations.[10] In Midwest states in particular, policies that grant utilities a monopoly on providing electricity to a certain area have significantly limited the opportunity for a solar-construction boom by failing to recognize and facilitate the third-party PPA model.[11]

.midwestenergynews.com/wp-content/uploads/2013/04/iowa-solar-ruling.pdf [hereinafter *SZ Enters.* Dist. Ct.].

6. SZ Enters., LLC v. Iowa Utils. Bd., No. 13-0642, 2014 WL 3377074, at *1 (Iowa July 11, 2014, as corrected Aug. 14, 2014).

7. *See 3rd-Party Solar PV Power Purchase Agreements (PPAs)*, DATABASE ST. INCENTIVES FOR RENEWABLES & EFFICIENCY (Feb. 2013), http://www.dsireusa.org/documents/summarymaps/3rd_Party_PPA_map.pdf.

8. *Solar Power Purchase Agreements*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/greenpower/buygp/solarpower.htm (last visited Nov. 4, 2014).

9. *Id.*

10. *See SZ Enters.* Dist. Ct., *supra* note 5, at 14–15.

11. Ryan Tracy, *Solar Energy Spurs a Power Struggle*, WALL ST. J. (June 23, 2013, 9:05 PM), http://online.wsj.com/news/articles/SB10001424127887324069104578527682342015380.

Meanwhile, states like California, Arizona, and New Jersey—which allow solar panel companies to sell their electricity through third-party PPA agreements—have seen just that boom.[12] These inconsistencies between states create market inefficiencies, because they discourage solar panel companies from expanding into states where they simply do not know whether they can operate.[13] These inconsistencies also stunt the development of a better clean energy system and prevent the United States from maximizing its energy potential.[14]

This Note proposes a model law to delineate how solar panel companies can sell electricity from panels installed on a customer's property and argues that states should enact this law to realize their energy and economic potential. Part I of this Note examines the basis for modern utility regulation, describes the ways in which the market has changed, and then outlines the third-party PPA model. Part II exposes the problems with the status quo, analyzes how the third-party PPA model mitigates the status quo's problems, and then evaluates how states have responded with laws and regulations allowing solar panel companies to operate in this manner. Part III addresses potential solutions, starting with a baseline proposal that state governments should facilitate the installation of so-

12. *Id.*; Jeff McMahon, *Four Ways the Solar Boom Has Rattled Utilities*, FORBES (Sept. 23, 2013, 4:12 PM), http://www.forbes.com/sites/jeffmcmahon/2013/09/23/four-ways-the-solar-boom-has-rattled-utilities.

13. Office of Energy Efficiency & Renewable Energy, U.S. Dep't of Energy, *Policy and Regulatory Environment*, ENERGY.GOV, http://energy.gov/eere/sunshot/policy-and-regulatory-environment (last visited Nov. 4, 2014) (noting that "key barriers to solar market development" include "[r]estrictive interconnection and net metering rules," "[r]egulatory uncertainty," and "siting restrictions in local codes, ordinances, and covenants"); *cf.* JOSEPH WIEDMAN ET AL., FREEING THE GRID 2012: BEST PRACTICES IN STATE NET METERING POLICIES AND INTERCONNECTION PROCEDURES 9 (2012), *available at* http://freeingthegrid.org/wp-content/uploads/2013/02/FTG2012.pdf (noting that "inconsistency is the enemy of clean energy development" because it "undermines the ability of businesses to operate efficiently across utility service territories or state lines, and increases costs to all program participants—utilities, consumers, businesses and commission staff—by forcing these stakeholders to master the idiosyncrasies of each individual state's programs").

14. *See* WIEDMAN ET AL., *supra* note 13. Nevertheless, solar energy was the fastest growing industry in the United States in 2010, and this arguably emphasizes the untapped potential that has yet to be drawn on in half of the country. Chris Meehan, *Solar Is U.S.'s Fastest Growing Industry Says SEIA CEO*, CLEANENERGYAUTHORITY.COM (Apr. 5, 2011), http://www.cleanenergyauthority.com/solar-energy-news/solar-is-fastest-growing-industry-in-country-040511.

lar panels on the "demand side"[15] of the electricity market. This change fits within the current model for regulating the energy industry, and much of the rest of the energy system can remain the same; for example, a regulated public utility providing traditional retail electric services will still be necessary.[16] The proposed model law allows solar panel companies to operate in a way that fosters healthy competition between all methods of electricity generation and distribution.

I. MODERN UTILITY REGULATION

Modern energy law as we know it has only been around since the mid-1970s, but its laws are based on fundamental assumptions that have their roots in policies from much earlier.[17] Those assumptions have not only provided the basis for government regulation of the electricity market, but have also shaped that regulation as it has developed over time. Part I of this Note explains the justifications for modern utility regulation, then examines how the electricity market actually functions. It then looks at how the electricity market has changed since modern regulation was first enacted. Finally, this Part provides an outline of the third-party PPA model, which was developed by solar panel companies to work within the existing electricity market framework.

15. This Note distinguishes between activities that occur on the "demand side" and the "supply side" of the electricity market. This divide occurs at each consumer's electricity meter. The meter measures the consumer's demand for electricity and assists in the coordination of utilities' consequent transmission of electricity to the consumer; these activities occur on the "supply side" of the market. *See* W.M. WARWICK, OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, U.S. DEP'T OF ENERGY, A PRIMER ON ELECTRIC UTILITIES, DEREGULATION, AND RESTRUCTURING OF U.S. ELECTRICITY MARKETS 1.1, 4.9, 5.7 (2002), *available at* http://eere.pnnl.gov/femp/publications/Primer-ElectricUtilitiesDeregulationRestructuring.pdf. The term "demand side" refers to electricity generation sources that are connected directly to a consumer's property, such as solar panels on a consumer's rooftop. *See id.* at A.10.

16. While beyond the scope of this Note, altering the generation stage of the energy industry also presents an opportunity to reimagine our power grid. Former Secretary of Energy Bill Richardson has said that "[r]egulated monopoly utilities . . . have left the U.S. with a 'third world power grid' and . . . that deregulated electricity markets can work." *See Interview, Bill Richardson*, PBS FRONTLINE, http://www.pbs.org/wgbh/pages/frontline/shows/blackout/interviews/richardson.html (last visited Nov. 4, 2014) (describing an interview with Bill Richardson on April 10, 2001).

17. Joseph P. Tomain, *The Dominant Model of United States Energy Policy*, 61 U. COLO. L. REV. 355, 356–69 (1990). For a survey of the development of U.S. energy policy, see JOSEPH P. TOMAIN & RICHARD D. CUDAHY, ENERGY LAW IN A NUTSHELL 65–106 (2d ed. 2011).

A. POLICY RATIONALES FOR MODERN UTILITY REGULATION

In most jurisdictions, electricity production is regulated as a natural monopoly, although this is not true in all jurisdictions.[18] The justifications for monopolized electricity production rest on a bedrock premise: a single, regulated entity that generates, transmits, and distributes electricity can provide these services for less, because a competitive market would lead to wastefully duplicative infrastructures.[19] Essentially, eliminating competition will eliminate the duplicative costs of multiple generation, transmission, and distribution systems that provide the same services to consumers in the same general location.[20] Consequently, regulated service will ensure dependable electrical service at a reasonable price, particularly in remote areas that would not receive the same attention in a competitive market.[21]

Therefore, the historical conception of a utility involves integration of the three functions of electricity generation, transmission, and distribution.[22] Historically, each of these

18. There are currently thirty-three states that regulate the electricity industry by imposing exclusive service areas for electric utilities. *See* AM. PUB. POWER ASS'N, RETAIL ELECTRIC RATES IN DEREGULATED AND REGULATED STATES: 2012 UPDATE 2 (2013); *The Only Correct Deregulated States Map*, ENERGY TARIFF EXPERTS (May 29, 2013), http://energytariffexperts.com/blog/2013/5/29/the-only-correct-deregulated-states-map.

19. *See* KATHARINE KOLLINS ET AL., OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, U.S. DEP'T OF ENERGY, NREL/TP-6A2-46723, SOLAR PV PROJECT FINANCING: REGULATORY AND LEGISLATIVE CHALLENGES FOR THIRD-PARTY PPA SYSTEM OWNERS 4 (2010), *available at* http://www.nrel.gov/docs/fy10osti/46723.pdf ("Retail electricity markets in the United States remain regulated in most states in part to protect consumers (rates and reliability) and to ensure a highly functioning electric grid. . . . [R]egulation of these markets prevents unnecessary duplication of assets such as transmission and distribution facilities."); THE REGULATORY ASSISTANCE PROJECT, ELECTRICITY REGULATION IN THE US: A GUIDE 3–4 (2011), *available at* http://www.raponline.org/document/download/id/645; WARWICK, *supra* note 15, at 2.1.

20. WARWICK, *supra* note 15, at 2.1 (citing the "high cost of distribution infrastructure" as a justification for monopolized utility services); Severin Borenstein & James Bushnell, *Electricity Restructuring: Deregulation or Reregulation?*, 23 REG.: CATO REV. BUS. & GOV'T, no. 2, 2000, at 47 ("In the transmission and distribution sectors, effective competition would require that rival firms duplicate one another's wire networks, which would be inefficient.").

21. WARWICK, *supra* note 15, at 2.1 (noting that "the government has granted individual utilities certain monopoly rights" in order "[t]o prevent price gouging and encourage widespread access").

22. *Id.* at 2.2; Borenstein & Bushnell, *supra* note 20, at 46 ("Analysis of the electricity industry begins with the recognition that there are three rather distinct components of it: generation, transmission, and distribution. . . . In

three functions was considered a natural monopoly, warranting government regulation to minimize steep start-up costs and duplicative waste while ensuring reasonable prices for consumers.[23] The electric utility, as a regulated monopoly, would generate electricity at a power plant, transmit the electricity from the power plant along a transmission line, and then distribute the electricity to individual homes and office buildings.[24]

Electric utilities operating as monopolies across these three functions are given exclusive service areas within which they provide electricity free from competition.[25] In exchange for this monopoly, the utility sells at a rate determined by the regulating entity, generally a state public utility commission or public

the United States, all three of these vertically related sectors have typically been tied together within a utility.").

23. Borenstein & Bushnell, *supra* note 20, at 46–47 (noting that "each sector was thought of as a natural monopoly"—transmission and distribution because of duplicative services and generation "because of the large scale of efficient generation plants and the losses that occurred with long-distance transmission, which made it more efficient to have local areas served by one or a small number of generating plants").

The Supreme Court's holding in *Munn v. Illinois*, 94 U.S. 113 (1876)—although it dealt with grain elevators—established the first major principle in energy law regarding natural monopolies: industries exhibiting the market behavior of a natural monopoly should be regulated by the states so as to prevent price gouging. *Id.* at 127–33.

More recently, however, the federal government and certain states have restructured the model to eliminate certain monopoly statuses. THE REGULATORY ASSISTANCE PROJECT, *supra* note 19, at 8. At the federal level, the Federal Energy Regulatory Commission (FERC) has allowed wholesale electricity sales to occur at market-based rates rather than being pegged to cost-of-service rates, as long as the seller is in a sufficiently competitive market. *See* G. William Stafford, *Electric Wholesale Power Sales at Market-Based Rates*, 12 ENERGY L.J. 291, 291 (1991). Additionally, several states have deregulated to allow their consumers to choose between competing power suppliers, which in turn means that these consumers only pay their utility company for its distribution service. THE REGULATORY ASSISTANCE PROJECT, *supra* note 19, at 14. This state-level deregulation meant that many utilities that had previously owned their own generation sources sold off those power plants. *Id. See generally* WARWICK, *supra* note 15, at 6.1–7.2 (discussing the causes of deregulation, the current state of deregulation, and how the market has adapted to these changes); *infra* Part I.B.3 (discussing how some states have attempted to encourage retail competition through deregulation).

24. WARWICK, *supra* note 15, at 2.2 ("The popular image of a utility is a company that has its own generation, transmission, and distribution and exists as somewhat of an island among similarly situated adjacent utilities.").

25. *Id.* at 2.1 ("Generally, an energy utility is provided an exclusive right to sell energy to retail customers in a specifically defined area, called the *service area* or *franchise territory*.").

service commission.[26] These rates are conventionally set based on the utility's costs, particularly capital investments and operating expenses, plus an additional amount to attract investors who can provide capital at favorable interest rates.[27] Historically, the conception was that the capital investments and operating expenses of the three functions could be bundled into one rate that could cover all costs when selling electricity to the end consumer.[28] Ultimately, this regulatory model envisions large-scale, capital-intensive, centralized energy production and distribution by a single entity, for which the consumer pays a rate that covers all the costs involved in the entire process, plus a reasonable return on the utility's investments.[29]

B. HOW THE ELECTRICITY MARKET ACTUALLY FUNCTIONS

In reality, almost no electric utility performs all three functions in a perfect bundle.[30] Instead, utilities produce some electricity themselves, and purchase additional electricity from entities whose primary function is to generate power for resale. This use of an interconnected network of generating plants, transmission lines, and distribution facilities requires coordinated, cooperative action from the interacting entities.

1. Electricity Generation Is a Competitive Market

While transmission and distribution continue to exhibit characteristics of natural monopolies,[31] generation has devel-

26. *Id.* at 5.1 ("In the United States, state [Public Utilities Commissions] regulate retail electricity prices while FERC regulates wholesale prices.").

27. *Id.* at 5.2. The rate formula is explained in TOMAIN & CUDAHY, *supra* note 17, at 182–83, as follows:

$R = O + (V - D)r$

The variables in this formula are defined as:

R The utility's total revenue requirement or rate level. This is the total amount of money a regulator allows a utility to earn.

O The utility's operating expenses.

V The gross value of the utility's tangible and intangible property.

D The utility's accrued depreciation. Combined $(V - D)$ constitute the utility's "rate base," also known as its capital investment.

r The rate of return a utility is allowed to earn on its capital investment or on its rate base.

28. *See* TOMAIN & CUDAHY, *supra* note 17, at 169–92.

29. *Id.* at 104, 180–92.

30. WARWICK, *supra* note 15, at 2.2 ("The fact is that only a small fraction of the 3,200 or so electric utilities perform all three functions and virtually no utility exists in isolation.").

31. *See* Tomain, *supra* note 17, at 387.

oped into a competitive market; electric utilities have opted to purchase electricity—from firms that only generate electricity but do not necessarily transmit or distribute it—and re-sell it to the end consumer.[32] This phenomenon began due to section 210 of the Public Utility Regulatory Policies Act of 1978, which allows independent electricity producers to access the power grid and sell their electricity.[33] This provision effectively separates the generation function from the perfectly vertically integrated utility, allowing businesses to participate in the wholesale generation market without building their own transmission and distribution lines. Congress and the Federal Energy Regulatory Commission (FERC) further facilitated this separation with the Energy Policy Act of 1992[34] and FERC's Order 888 in 1996,[35] which allow generation-only firms, known as non-utility generators (NUGs), to have open and nondiscriminatory access to utilities' transmission lines. Consequently, generation competition has increased as new electricity suppliers have entered the market.[36] NUGs are now significant players in the wholesale generation market, and account for thirty-four percent of all electricity generated in the United States.[37]

A wide variety of energy resources make up the electricity generation market, each of which has different generation

32. WARWICK, *supra* note 15, at 2.2 ("[V]ery few [electric utilities] own enough generating resources to meet all of their needs. . . . As a result, the vast majority of utilities rely on power purchases from others. Purchased power is transmitted, or *wheeled*, from remote generators across the transmission grid to local utility substations connected to distribution lines that serve end user loads."); *Id.* at 2.3 fig.2.1 ("In reality, even in a regulated environment, most utilities buy power from generation and transmission utilities."); *Id.* at 3.4 ("[N]ot all utilities build, own, or operate their own generation.").

33. Public Utility Regulatory Policies Act of 1978, Pub. L. No. 95-617, § 210, 92 Stat. 3117, 3144–47.

34. Energy Policy Act of 1992, Pub. L. No. 102-486, tit. VII, 106 Stat. 2776, 2905–21.

35. Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities, 62 Fed. Reg. 12,274, 12,275 (Mar. 14, 1997) (to be codified at 18 C.F.R. pt. 35).

36. TOMAIN & CUDAHY, *supra* note 17, at 364 ("[O]ver the last two decades, there has been an increase in the number of firms that generate electricity but do not own or operate transmission facilities."); EDISON ELEC. INST., KEY FACTS ABOUT THE ELECTRIC POWER INDUSTRY 4–5 (2007), *available at* http://www.cewd.org/toolkits/teacher/eeipub_keyfacts_electric_industry.pdf (noting that there are "many new electricity suppliers that have emerged as competition advances and that are vying to compete in wholesale and retail electricity markets").

37. *See* EDISON ELEC. INST., *supra* note 36, at 5.

costs. These include fossil fuel sources such as coal, natural gas, and oil; nuclear energy; and renewable energy sources such as wind, solar, hydropower, and geothermal energy.[38] This variety in generation methods and costs creates a scaling model of energy generation that is dependent upon marginal cost of production and fluctuating demand levels. Once the generation facilities have been built, capital investments become sunk costs.[39] Therefore, power is generated and/or purchased for resale based on which generation method has the lowest marginal cost of production at the current demand level; this model is known as "merit order."[40] As demand for electricity fluctuates across the hours of the day and the months of the year, additional power sources are dispatched as the cheapest sources reach maximum cost-efficient generation; low-cost plants are sufficient when demand is low, while almost all generation sources are drawn upon during peak demand.[41]

2. The Competitive Market Facilitates Coordinated Action To Monitor Consumer Demand

Because the electric utilities are no longer always vertically integrated entities that perform all three functions in isolation from other electric utilities, the players in the electricity market must coordinate with each other to meet consumer demand.[42]

38. U.S. ENERGY INFO. ADMIN., DOE/EIA-0035(2013/09), SEPTEMBER 2013 MONTHLY ENERGY REVIEW 95 (2013).

39. WARWICK, *supra* note 15, at 3.5.

40. *Id.* ("[P]lant operating decisions (which plants to run and how long) are made based on variable costs, which are dominated by fuel costs. These controllable costs are referred to as *production costs*. Plants are generally *dispatched* (started and run) to serve loads based on production costs . . . . That way the least expensive plants run the most, minimizing production costs and, thus, minimizing total electricity costs."); *see also* EDISON ELEC. INST., *supra* note 36, at 30 ("Electric companies schedule the operation of their generating units to meet . . . changing patterns of use, with more expensive units operating only at times of high demand.").

In states where renewable portfolio standards have been established, generation is also guided by a utility's need to meet these standards. *See* WARWICK, *supra* note 15, at 5.9.

41. WARWICK, *supra* note 15, at 3.5 ("Variations in energy demand result in different combinations of power plants, and therefore, different production costs. When demand is low, only low-cost plants operate. When demand is high, such as during summer or winter peaks, almost all available generation is needed and, therefore, production costs are high.").

42. EDISON ELEC. INST., *supra* note 36, at 19; THE REGULATORY ASSISTANCE PROJECT, *supra* note 19, at 16–18. This coordination formally exists through regional transmission organizations and independent system opera-

Coordination might not be necessary except for electricity's unique and fundamental property that it cannot be stored for later use.[43] Instead, electricity must be produced when the consumer needs it.[44] Therefore, the electric load that all generators supply across the country must equal the sum of demand from all consumers across the country.[45]

This coordination requires monitoring of several factors: (1) the amount of electricity demanded by consumers; (2) the amount of electricity flowing over the transmission system from the electric utility's own generators; and (3) the amount of electricity flowing over the transmission system purchased from other entities' generators.[46]

3. Some States Have Opted To Encourage Retail Competition Through Deregulation

While the federal government is responsible for regulating energy generation in the wholesale market, each state is responsible for establishing its own retail market for electricity

tors, which "plan, operate, dispatch, and provide open-access transmission service." *Id.* at 17. There is also the North American Electric Reliability Council, which is responsible for reliability planning to ensure dependable delivery of electricity across the country. *See id.* at 16.

43. THE REGULATORY ASSISTANCE PROJECT, *supra* note 19, at 16. Batteries are the conventional method for storing electricity once it has been processed from raw materials, but they remain inefficient and are expensive for storing electricity in large quantities. *See* Paul Tullis, *Want To Revolutionize Energy? Improve the Battery*, SMITHSONIAN.COM (May 22, 2013), http://www.smithsonianmag.com/science-nature/Want-to-Revolutionize-Energy-Improve-the-Battery-208379831.html (discussing batteries' difficulties in compactly storing large quantities of energy and noting that improvements in one area often lead to deficiencies in another); *see also* David Lindley, *Smart Grids: The Energy Storage Problem*, 463 NATURE 18, 18 (2010), *available at* http://www.nature.com/news/2010/100106/pdf/463018a.pdf ("[E]lectrical energy is difficult and expensive to store in large quantities.").

44. EDISON ELEC. INST., *supra* note 36, at 19.

45. In reality, there are three separate grids in the United States, each of which hosts several regional power markets; each of these three grids performs the above-described task of matching supply to demand. LINCOLN L. DAVIES ET AL., ENERGY LAW AND POLICY 303 (West Academic Publishing 2014). Additionally, due to the fluctuations in consumer demand, the potential for unexpected increases in demand, and the potential for plant failures, regulators actually require utilities to maintain a reserve margin, typically set between fifteen to twenty percent above actual demand. WARWICK, *supra* note 15, at 3.8.

46. *See* EDISON ELEC. INST., *supra* note 36, at 20.

sales.[47] In recognition of the changing dynamics at the wholesale generation stage, some states have taken the federal requirement—of open, nondiscriminatory access to transmission lines for NUGs—to heart by allowing retail customers to purchase electricity from any supplier on the grid.[48] This deregulation removes old requirements that customers purchase electricity from their local utility. In total, seventeen states and the District of Columbia have deregulated to varying degrees.[49]

Deregulation requires a new model with changes at the various stages in the electricity industry. States have to enlarge their markets beyond individual utility service areas in order to dilute the power of incumbent providers in each locality.[50] Concurrent with an expanded market, states generally require electric utilities to divest themselves of their generation facilities in their local markets.[51] Divestiture limits the generation capabilities of incumbent utilities—which previously dominated the market in their monopolized territory—thereby inviting competitors into that market.[52] Finally, generation competition requires open access to transmission lines to the extent that the transmission lines can bear the electric load.[53]

In summary, energy law continues to be a patchwork of rules and regulations across the country, mixing state and federal law. The monopoly utility is no longer a perfectly vertically integrated entity. Instead, there is competition in the wholesale generation market across the country and at the retail level in many states. But in the majority of states, there remains no

47. DAVIES ET AL., *supra* note 45, at 311 ("The Federal Energy Regulatory Commission (FERC) regulates interstate wholesale electricity sales. State public utility commissions (PUCs) regulate the retail market.").

48. EDISON ELEC. INST., *supra* note 36, at 28–29. Several additional factors spurred the trend towards deregulation, namely that (a) there was a broader societal shift towards deregulation and market restructuring, (b) rate increases pushed politicians to consider electricity competition, and (c) consumers were increasingly demanding clean energy. *See* DAVIES ET AL., *supra* note 45, at 393.

49. AM. PUB. POWER ASS'N, *supra* note 18, at 2; *The Only Correct Deregulated States Map*, *supra* note 18 (designating states blue, green, or purple to denote electricity deregulation); *Explore Energy Rates in District of Columbia*, SAVE ON ENERGY, https://www.saveonenergy.com/District-of-Columbia/ (last visited Nov. 4, 2014).

50. WARWICK, *supra* note 15, at 6.7.

51. *Id.*

52. *Id.*

53. THE REGULATORY ASSISTANCE PROJECT, *supra* note 19, at 17.

competition at the retail level, which poses barriers to solar providers in those states.

C. OUTLINING THE THIRD-PARTY POWER PURCHASE AGREEMENT

With the development of NUGs and the dissipation of the perfectly vertically integrated electric utility monopoly, there is room for solar panel companies to operate within the electricity industry on a larger scale. Solar panel companies share a number of similarities with NUGs, but there are also differences that distinguish the way a solar panel company can best provide electricity to customers. Upfront capital costs are the most significant hurdle to constructing solar power facilities,[54] much like conventional power plants. Unlike conventional power plants though, there are minimal continuing costs after construction, since solar facilities do not have fuel needs, require minimal maintenance, and do not require on-site employees to run the facility.[55]

In order to overcome the hurdle of significant upfront capital costs—and encourage purchases by individual consumers—solar panel companies use a contract called a third-party power purchase agreement (PPA).[56] If a homeowner or a business wants to install solar panels on its rooftop, or a town wants to install solar panels on its city hall, schools, or any other municipal building, they typically do so through a PPA.[57]

54. Chris Nelder, *Financial Innovation Is the Next Big Thing in Clean Energy and Efficiency*, SMARTPLANET (Nov. 9, 2013), http://www.smartplanet.com/blog/the-take/financial-innovation-is-the-next-big-thing-in-clean-energy-and-efficiency (acknowledging that "solar systems . . . are hard to finance" and that "coming up with the initial capital can be too high a hurdle"); Robert Peltier, *High Capital Costs Plague Solar (RPS Mandates, Cost Dilution via Energy Mixing Required) Part III*, MASTERRESOURCE (Nov. 19, 2009), https://www.masterresource.org/solar-power/high-capital-costs-plague-solar-rps-mandates-cost-dilution-via-energy-mixing-required-part-iii (noting the "enormous . . . capital cost considerations of [photovoltaic] projects").

55. *See* Nelder, *supra* note 54 ("[T]he only real risk to continued cash flow is weather.").

56. *Solar Power Purchase Agreements*, *supra* note 8 (noting that PPAs "enable the host customer to avoid many of the traditional barriers to adoption for organizations looking to install solar systems" including "high up-front capital costs").

57. *See, e.g.*, Joyce Lobeck, *Solar Zone: More Schools, Business Become Generating Plants*, YUMA SUN (Oct. 19, 2013, 12:00 AM), http://www.yumasun.com/solar-zone-more-schools-business-become-generating-plants/article_e3bcacfc-0e0d-5943-9ee8-59cbe71f6972.html (observing that "solar projects are popping up all over the community at businesses, schools and even

In a brief overview of the third-party PPA model, the most important characteristic is that the solar panel company bears the upfront costs for the production and installation of the solar panel facility, and consequently obtains certain federal tax credits for these activities.[58] Such cost allocation provides the consumer the benefits of solar power without immediately bearing the costs of constructing the solar panel facility, thereby encouraging greater adoption of solar power.[59] The solar panel company often partners with an outside investor, and—when selling to towns and municipalities—can raise additional capital with municipal bonds.[60] These fundraising steps are central to the ingenuity of the third-party PPA model: municipalities do not pay taxes, and therefore have no use for federal tax credits; solar panel companies, however, are private, tax-paying businesses, and are able to use these tax credits to offset their costs or, alternatively, the tax credits can be sold to an investor in exchange for additional upfront capital.[61] With sufficient capital, the solar panel company builds the facility, usually on the consumer's rooftop or in a nearby open area, and continues to perform any necessary maintenance on the facility over the

Yuma City Hall" and that "most customers enter into a power purchase agreement with a third party that would fund the upfront cost").

58. For a full explanation of the third-party PPA model, see *Solar Power Purchase Agreement Graphic*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/greenpower/buygp/sppa.htm (last visited Nov. 4, 2014).

59. *Solar Power Purchase Agreements*, *supra* note 8.

60. Third-party PPA financing is a creative venture that involves attracting investors who are interested in the renewable energy certificates that the solar panel facilities generate, taking advantage of accelerated depreciation, and using investment tax credits to offset other aspects of the investors' own balance sheets. KARLYNN CORY ET AL., OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, U.S. DEP'T OF ENERGY, NREL/TP-670-43115, SOLAR PHOTOVOLTAIC FINANCING: DEPLOYMENT ON PUBLIC PROPERTY BY STATE AND LOCAL GOVERNMENTS vi, 4–8, 21–24 (2008), *available at* http://www.nrel.gov/docs/fy08osti/43115.pdf; KOLLINS ET AL., *supra* note 19, at 19, 40–41. This financing method is developing into an established market that some deem reliable enough to warrant favorable bond ratings. Diane Cardwell, *Bonds Backed by Solar Power Payments Get Nod*, N.Y. TIMES (Nov. 14, 2013), http://www.nytimes.com/2013/11/15/business/energy-environment/bonds-backed-by-solar-power-payments-get-nod.html. *See generally* Samantha Jacoby, Comment, *Solar-Backed Securities: Opportunities, Risks, and the Specter of the Subprime Mortgage Crisis*, 162 U. PA. L. REV. 203 (2013) (discussing the history of financing solar panel facilities and how to improve these financing mechanisms).

61. CORY ET AL., *supra* note 60, at vi, 4–8, 21–24; KOLLINS ET AL., *supra* note 19, at 19, 40–41.

course of the PPA.[62] The rooftop property or land where the facility is built is leased from the customer, who also technically owns the facility.[63] The solar panel company, however, maintains the right to sell the electricity to the consumer at discounted rates, usually for an extended period of up to 20 years. At the end of the PPA, the consumer becomes the owner of the rights to the electricity, no longer purchasing it from the company.[64] Throughout the lifetime of the installed solar panel facility, however, the consumer can still purchase electricity from their electric utility company when the consumer's solar panels do not generate sufficient electricity to meet the consumer's demand.[65] In many states, the consumer also benefits from "net metering" laws that allow the consumer to sell excess electricity from their solar panel facility to the electric utility in exchange for money or credits to be used against the consumer's potential future purchase of electricity from the utility.[66]

The third-party PPA model works well in its niche and is designed to fit within the energy industry's current structure. The model allows consumers, which otherwise would never have the necessary finances, to purchase electricity from solar panels. As discussed below, the model also benefits a state's overall economic efficiency, and utilities stand to benefit from the model if proper regulation is introduced to formally harmonize the third-party PPA with electric utility law.

II. HOW DEMAND-SIDE GENERATORS AND THE LAWS THAT FACILITATE THEM IMPROVE THE MODERN UTILITY MODEL

The scaling model for generation—wherein cheaper methods of generation are used before more expensive facilities are dispatched—still means that a large amount of generation ca-

62. *See generally* KOLLINS ET AL., *supra* note 19, at 2–3; *Solar Power Purchase Agreement Graphic*, *supra* note 58.

63. KARLYNN CORY ET AL., OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, U.S. DEP'T OF ENERGY, NREL/FS-6A2-46668, POWER PURCHASE AGREEMENT CHECKLIST FOR STATE AND LOCAL GOVERNMENTS 7 (2009), *available at* http://www.nrel.gov/docs/fy10osti/46668.pdf.

64. *Id.*

65. *See Solar Power Purchase Agreement Graphic*, *supra* note 58.

66. *Solar Power Purchase Agreements*, *supra* note 8; *Solar Power Purchase Agreement Graphic*, *supra* note 58. For a sample contract exemplifying a typical third-party PPA, see SolarCity Corp., Solar Power Purchase Agreement (City of San Jose California), http://www3.sanjoseca.gov/clerk/Agenda/20110920/20110920_02a2sjfacon.pdf (last visited Nov. 4, 2014).

pacity is unused most of the time.[67] Even with coordination between the thousands of electric utilities and generators, there are still plenty of generating facilities that are left unused more often than not.[68] The need for a scaling model can be reduced by using generating facilities that inherently tend to match the ebb and flow of consumer demand throughout the day: solar panels.[69]

Many states are encouraging the construction of solar power facilities to compete with conventional power plants, and are generally doing so in a narrowly tailored and thoughtful manner.[70] In effect, solar panel companies like Mr. Shear's Eagle Point Solar reduce the consumer's need to purchase electricity on the market.[71]

Section A of Part II first analyzes the third-party PPA model, discussing how this model can provide benefits within the existing framework for the electricity industry. Section A then notes that the model also imposes certain inequities on the industry. Section B analyzes the reasoning of the Iowa Supreme Court in *SZ Enterprises v. Iowa Utilities Board* as it applies to third-party PPAs.[72] Section C examines the different laws and regulations that states have enacted to responsibly

67. *See* PAUL L. JOSKOW, MASS. INST. TECH. CENTER FOR ENERGY & ENVTL. POL'Y RES., COMPETITIVE ELECTRICITY MARKETS AND INVESTMENT IN NEW GENERATING CAPACITY 7 (2006), *available at* http://dspace.mit.edu/bitstream/handle/1721.1/45055/2006-009.pdf ("[I]n New England in 2001, 93% of the energy was supplied by 55% of the installed generating capacity while the remaining 45% of the capacity supplied only about 7% of the energy." (footnote omitted)).

68. *Id.*

69. *Why Solar?*, ENGINEERING.COM, http://www.engineering.com/SustainableEngineering/RenewableEnergyEngineering/SolarEnergyEngineering/WhySolarEnergy/tabid/3893/Default.aspx (last visited Nov. 4, 2014) ("Solar power generation has several advantages over other forms of electricity generation" including "[m]atching [p]eak [t]ime [o]utput with [p]eak [t]ime [d]emand."). Solar power is also being used to meet off-peak demand by means of solar thermal energy, which has potential for innovative energy storage. Matthew L. Wald, *Arizona Utility Tries Storing Solar Energy for Use in the Dark*, N.Y. TIMES (Oct. 17, 2013), http://www.nytimes.com/2013/10/18/business/energy-environment/arizona-utility-tries-storing-solar-energy-for-use-in-the-dark.html.

70. *Cf. 3rd-Party Solar PV Power Purchase Agreements (PPAs)*, *supra* note 7 (mapping those states that have affirmatively authorized third-party solar PPAs).

71. *Solar Power Purchase Agreements*, *supra* note 8; *Solar Power Purchase Agreement Graphic*, *supra* note 58.

72. SZ Enters., LLC v. Iowa Utils. Bd., No. 13-0642, 2014 WL 3377074 (Iowa July 11, 2014, as corrected Aug. 14, 2014).

encourage this model for solar panel facilities and proposes other supplementary provisions that can further enhance the appeal of third-party PPAs both for consumers and electric utilities.

A. ANALYZING THE THIRD-PARTY POWER PURCHASE AGREEMENT MODEL

In effect, the third-party PPA reduces the consumer's need to purchase electricity from the utility by offering the consumer a source selling power on the demand side of the relationship. In the eyes of the district court in Iowa, this was simply a creative form of energy efficiency, which has the same end result of reducing the consumer's need to purchase electricity from the utility.[73] From an opposing viewpoint, however, it is an explicit provision of the third-party PPA that the solar panel company *sells* electricity to the consumer, much like the electric utility does.[74] To the electric utility, this looks a lot like competition, even though the utility's regulating commission has given the utility a monopoly for an exclusive service area.

Despite an electric utility's understandable concerns with the third-party PPA model, the model is actually quite compatible with the existing system. The era of monolithic, perfectly vertically integrated utilities is over; wholesale electricity generation is established as a competitive marketplace.[75] In this competitive marketplace, solar panel companies in third-party PPAs have a primary function that is essentially the same as that of NUGs: to generate and sell electricity. The key distinction, however, is that in a traditionally regulated state, a utility company with an exclusive service territory can argue that the solar panel company is selling retail electricity within the utility's territory, rather than selling wholesale electricity like a typical NUG.

However, the modern competitive model of deregulated states generally mitigates this issue, allowing the third-party PPA's demand-side generation to neatly fold into the already

73. *SZ Enters.* Dist. Ct., *supra* note 5, at 14 ("[A] third-party developer of renewable energy systems, which essentially provides the customer the same service [as a provider of behind-the-meter energy efficiency services] by different means, should be treated similarly.").

74. *See* Ethan Howland, *The Four Greatest Challenges Utilities Face in 2014*, UTIL. DIVE (Dec. 9, 2013), http://www.utilitydive.com/news/the-four-greatest-challenges-utilities-face-in-2014/202574.

75. *See supra* Part I.B.1.

existing coordinated monitoring of consumer demand.[76] A new third-party PPA reduces the consumer's need to purchase electricity from the grid, but this leaves the job duties of control centers and their transmission operators unaltered; these control centers continue to monitor electricity demand to determine how much supply-side generation must occur, and the demand-side PPAs simply reduce the first of the three factors that these operators monitor: the amount of electricity demanded by consumers.[77] Consequently, the scaling model's merit order—for firing up power plants and changing power source combinations as demand fluctuates—continues to operate based on the lowest marginal cost of production.[78] In fact, the reduced total demand on the utility actually means that the utility remains on the cheaper end of the merit order's sliding scale of production.[79]

Concurrently, third-party PPAs help maximize efficiency in a competitive model. Solar power generation peaks in the middle of the day and in the summer, which matches consumer demand peaks.[80] This inherent matching between generation and demand can reduce the need to build additional capital-intensive power plants that are only fired up when demand is peaking,[81] or to keep online old power plants that have reduced efficiency and higher pollution rates.[82] Thereby, demand-side solar PPAs can actually minimize stagnant waste for supply-side generators. Essentially, solar PPAs can further facilitate the efficiency of an already interconnected grid of coordinating utilities.[83]

Furthermore, third-party PPAs help facilitate deregulation in those states where this trend has occurred. Deregulated states often face the challenge of getting new competitors to en-

76. *See supra* Part I.B.2.

77. *See* WARWICK, *supra* note 15, at 3.5.

78. THE REGULATORY ASSISTANCE PROJECT, *supra* note 19, at 77; *Energy Efficiency As a Resource*, AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., http://aceee.org/topics/energy-efficiency-resource (last visited Nov. 4, 2014) ("Energy savings from customer energy efficiency programs are typically achieved at 1/3 the cost of new generation resources.").

79. *Cf.* WARWICK, *supra* note 15, at 3.8.

80. *Why Solar?*, *supra* note 69.

81. *See* THE REGULATORY ASSISTANCE PROJECT, *supra* note 19, at 77; *Energy Efficiency As a Resource*, *supra* note 78.

82. *See* WARWICK, *supra* note 15, at 3.5 (explaining potential sources of inefficiency in various generating plants).

83. *Cf. id.* at 4.3 (describing the integration of local and remote power generators).

ter into the formerly exclusive territory of an incumbent utility.[84] Without competitors in the market, consumers will turn back to their incumbent utility, defeating the purpose of deregulation. Laws that make third-party PPAs legal and encourage their implementation can create a host of new competitors in the form of solar panel companies eager to serve customers across the state. This facilitates states' goals of deregulation and increasing consumer choice.[85] In addition, much like the control centers and their transmission operators, the power exchanges of deregulated states can remain intact, as they function on the supply-side and essentially fold third-party PPA considerations into consumer-demand calculations.

B. ANALYZING *SZ ENTERPRISES V. IOWA UTILITIES BOARD*

The case of *SZ Enterprises v. Iowa Utilities Board* arose as a result of the City of Dubuque's desire to enter into a third-party PPA with SZ Enterprises (doing business as Eagle Point Solar).[86] Eagle Point Solar filed a Petition for Declaratory Order with the Iowa Utilities Board to establish whether Eagle Point Solar would be operating as a public utility.[87] Iowa Code § 476.1 defines "public utility" to include entities "[f]urnishing . . . electricity to the public for compensation."[88] The Iowa Utilities Board held that Eagle Point Solar would be operating as a public utility under its third-party PPA, and therefore prohibited Eagle Point Solar from entering into this PPA with the City of Dubuque.[89] Eagle Point Solar appealed the decision, and the Iowa District Court for Polk County reversed, holding that Eagle Point Solar would not be operating as a public utility.[90]

The decision was appealed again, and the Iowa Supreme Court heard the case. The Iowa Supreme Court affirmed the district court's decision and gave Mr. Shear the go-ahead to use the third-party PPA model.[91] The court noted that homeowners who have purchased and installed solar panels at their own ex-

84. *See supra* Part I.B.3.

85. WARWICK, *supra* note 15, at 6.7.

86. *SZ Enters.* Dist. Ct., *supra* note 5, at 3.

87. *Id.* at 4.

88. IOWA CODE § 476.1 (2014); *see also SZ Enters.* Dist. Ct., *supra* note 5, at 7.

89. *SZ Enters.* Dist. Ct., *supra* note 5, at 5.

90. *Id.* at 14.

91. SZ Enters., LLC v. Iowa Utils. Bd., No. 13-0642, 2014 WL 3377074 (Iowa July 11, 2014, as corrected Aug. 14, 2014).

pense are not regulated by the Iowa Utilities Board.[92] The court reasoned that therefore the real issue was not the supplying of electricity on the demand side of the meter, but rather the creative financing method, which allowed the solar panel company to bear the upfront costs.[93] The court also emphasized that solar power companies do not wield as much monopolistic power as electric utilities, and that any third-party PPA transaction was an "arms-length transaction between a willing buyer and a willing seller," reducing potential for abuse or consumer protection issues.[94] The court did express concern for electric utilities losing customers, but ultimately found no evidence that the "economic health of regulated providers has been adversely affected in states such as California, Nevada, Arizona, and Colorado," where the third-party PPA model has been well accepted.[95] After weighing eight factors that included these above-mentioned considerations, the court concluded, "the balance of factors point away from a finding that the third-party PPA for a behind-the-meter solar generation facility" constitutes a public utility subject to regulation.[96]

C. THE VALUE OF LAWS AND REGULATIONS ADDRESSING THE THIRD-PARTY PPA MODEL

Recognizing the value that third-party PPAs can bring to a market, nearly half of the states have taken action to encourage their use, predominantly through legislation and regulation.[97] As seen below, these provisions are often part of a coordinated effort to encourage residential solar panel installation. In addition to formally recognizing the third-party PPA model, states have also incorporated the model as a form of energy efficiency, set up loan programs, facilitated outside financing of the solar panel facilities, and established a fluid electricity model so that consumers can sell surplus electricity to their utility.[98]

92. *Id.* at *25.
93. *Id.*
94. *Id.*
95. *Id.* at *26.
96. *Id.* at *27.
97. *3rd-Party Solar PV Power Purchase Agreements (PPAs)*, *supra* note 7.
98. *See Loan Programs*, DATABASE ST. INCENTIVES FOR RENEWABLES & EFFICIENCY, http://www.dsireusa.org/solar/solarpolicyguide/?id=15 (last visited Nov. 4, 2014); *Net Metering*, SOLAR ENERGY INDUSTRIES ASS'N, http://www.seia.org/policy/distributed-solar/net-metering (last visited Nov. 4, 2014); *cf. Net Metering*, NAT'L GRID, http://www.nationalgridus.com/

At the same time, however, states recognize that third-party PPAs leave the electric utility at the mercy of the consumer. The consumer still has the ability to purchase electricity from the electric utility whenever the consumer's solar power is insufficient, making the consumer-utility relationship something of a one-way street; the utility does not have the same luxury of choosing when to offer its services to the consumer.[99] Therefore, states have also taken action to mitigate these inequities between the consumer and the utility. Net metering is one potential mechanism, under which states may cap the amount of credit that consumers earn towards next month's bill when they generate more electricity than they consume in the current month.[100] Another option that states have considered is to include cost-shifting provisions that ensure that consumers with third-party PPAs still pay their share of a utility's non-operating costs, namely for the utility's transmission and distribution infrastructure costs.[101]

Subsection 1 discusses how to define and formally recognize the third-party PPA model. Subsection 2 addresses how to incorporate the model into energy efficiency standards, while Subsection 3 does the same for renewable portfolio standards. Subsection 4 discusses the important public and private financing tools for third-party PPAs. Subsection 5 balances the benefits of third-party PPAs against the costs to electric utilities through a discussion of net metering and electric utilities' non-operating costs. Finally, Subsection 6 argues for the use of feed-in tariffs as an additional equitable incentive that builds on the principles of net metering. These Subsections cite exemplary statutory language—where such language exists—from states

masselectric/business/energyeff/4_net-mtr.asp (last visited Nov. 4, 2014) ("[N]et metering allows these [distributed generation] customers to financially balance out the total amount of energy imported with the total amount of energy exported over the course of a billing period (typically about a month).").

99. *Cf. Net Metering*, SOLAR ENERGY INDUSTRIES ASS'N, *supra* note 98 ("[S]ome utilities perceive net metering policies as lost revenue opportunities.").

100. *Cf. Net Metering*, DATABASE ST. INCENTIVES FOR RENEWABLES & EFFICIENCY, http://www.dsireusa.org/solar/solarpolicyguide/?id=17 (last visited Nov. 4, 2014) (describing the Interstate Renewable Energy Council's best practices for net metering). The ensuing sections of this Note discuss the balancing of these various considerations to reach an equitable middle ground between the interests of utilities and parties entering into third-party PPAs.

101. *See, e.g.*, Arizona Public Service Company, Docket No. E-01345A-13-0248, at 6, 29 (Arizona Corp. Comm'n Nov. 14, 2013), http://images.edocket.azcc.gov/docketpdf/0000149849.pdf.

that recognize third-party PPAs and have adopted laws addressing these various issues.

1. Defining and Formally Recognizing Third-Party Energy Producers

The first step in encouraging third-party PPAs is to formally recognize their existence and legitimacy. A basic tenet of the model is that the power generation occurs on the demand side of the meter.[102] Many also specify that the solar panel facility must be connected to the grid for power transfers to and from the electric utility.[103] These definitions provide the benefit of distinct clarity for how solar panel companies can operate and structure their third-party PPAs.[104] From the electric utility's perspective, the consistency between all third-party PPAs can make the utility's job more manageable, foreclosing the threat of having to deal with various unwieldy consumer contracts; this allows for a more streamlined analysis of the total reduced consumer demand and minimizes the need for the electric utility to give a consumer's solar panel facility additional, special attention.[105]

Consistent with recognizing solar companies' third-party PPAs, states also establish at the outset that these solar panel

102. 220 MASS. CODE REGS. 18.02 (2014) (recognizing a "Host Customer" as "a Customer with a . . . Facility that generates electricity on the Customer's side of the meter").

103. *See, e.g.*, DEL. CODE ANN. tit. 26, § 1014(d) (2014) (establishing net metering for customers that contract with "a third party that owns or operates an electric generation facility that . . . [u]ses as its primary source of fuel solar," "[i]s located on the customer's premises," and "[i]s interconnected and operated in parallel with an electric distribution company's transmission and distribution facilities"); MD. CODE ANN., PUB. UTIL. COS. § 7-306(a)(4) (LexisNexis 2013) (recognizing as an "[e]ligible customer-generator" a "customer that . . . contracts with a third party that owns and operates a . . . solar . . . electric generating facility" that is "located on the customer's premises," "is interconnected and operated in parallel with an electric company's transmission and distribution facilities," and is "intended primarily to offset all or part of the customer's own electricity requirements").

104. *See* TONY DUTZIK & ROB SARGENT, ENV'T AM. RESEARCH & POLICY CTR., LIGHTING THE WAY: WHAT WE CAN LEARN FROM AMERICA'S TOP 12 SOLAR STATES 31 (2013), *available at* http://www.environmentamericacenter.org/sites/environment/files/reports/Lighting_the_way_EnvAM_scrn.pdf ("Leading solar states have passed laws clarifying the legal status of third-party PPAs, giving consumers and the solar industry the confidence they need to develop the business model in their states.").

105. *See generally* KOLLINS ET AL., *supra* note 19, at 7–14 (discussing challenges for the definition of electric utilities in regard to third-party PPAs, potential solutions, and the benefits and implications of those solutions).

companies are not public utilities.[106] Alternatively, some states' regulating agencies have examined their statutory definition of a "public utility" to determine that the third-party PPAs simply did not meet definition of a public utility, much like the Iowa Supreme Court.[107] While it may seem unnecessary for there to be a law to the same effect once a regulating agency determines that third-party PPAs do not raise utility licensure issues, the existence of such a law provides stability, an attractive consideration for potential solar panel companies.

2. Using Third-Party PPAs To Satisfy Energy Efficiency Standards

A number of states have required their electric utilities to meet certain energy efficiency standards by a given deadline.[108] Energy efficiency is currently one of the most cost-effective ways to manage energy demands.[109] In order to promote and

106. *See, e.g.*, N.M. STAT. ANN. § 62-13-13.1.A, B (2013) ("[A] person not otherwise a public utility shall not be deemed to be a public utility . . . solely because the person owns or controls all or any part of any renewable energy distributed generation facility that: (1) is located on the host's site; (2) produces electric energy used at the host's site and sold to the host or the host's tenants or employees located at the host's site; and (3) shares a common point of connection with the electric utility serving the area. . . . Nothing contained in this section shall be interpreted to prohibit the sale of energy produced by the renewable energy distributed generation facility to the electric utility serving the area in which the renewable energy distributed generation facility is located."); TEX. UTIL. CODE ANN. § 39.916(a)(2), (k) (West Supp. 2014) (defining a "[d]istributed renewable generation owner" to include "a retail electric customer on whose side of the meter distributed renewable generation is installed and operated, regardless of whether the customer takes ownership of the distributed renewable generation" and establishing that "[n]either a retail electric customer that uses distributed renewable generation nor the owner of the distributed renewable generation that the retail electric customer uses is an electric utility").

107. SolarCity Corporation, Docket No. E-20690A-09-0346, at 71 (Arizona Corp. Comm'n July 12, 2010), http://images.edocket.azcc.gov/docketpdf/0000114068.pdf ("[W]hen SolarCity Corporation provides services to a school, government, or non-profit entity, specifically limited to such an individual customer serving only a single premises of that customer, pursuant to a Solar Services Agreement . . . SolarCity Corporation is not acting as a public service corporation.").

108. *Energy Efficiency Resource Standards*, DATABASE ST. INCENTIVES FOR RENEWABLES & EFFICIENCY (Feb. 2013), http://www.dsireusa.org/documents/summarymaps/EERS_map.pdf. California, Washington, and Minnesota have gone so far as to require the utilities to secure all cost-effective energy efficiency resources. THE REGULATORY ASSISTANCE PROJECT, *supra* note 19, at 75.

109. *See* THE REGULATORY ASSISTANCE PROJECT, *supra* note 19, at 26 ("Energy efficiency is typically the least expensive way to meet consumer needs for energy services."); *id.* at 77 ("Energy efficiency is considered *cost-*

achieve energy efficiency, many states are allowing demand-side renewable energy facilities to be folded into the concept.[110] The Iowa district court reached this end result,[111] but the above-cited Connecticut statute, for example, specifically addresses the issue, eliminating the need for the courts to engage in such an in-depth analysis to reach the same conclusion.

Third-party PPAs work well within the concept of energy efficiency, providing many of the same benefits that high-efficiency appliances and other energy efficiency measures provide. One of the primary benefits of energy efficiency is that, from the electric utility's perspective, each kilowatt saved is worth more than the cost of producing that kilowatt; the utility saves on transmission and distribution costs, system wear-and-tear, and remains on the cheaper end of the merit order scale of power sources.[112] Demand-side power sources provide these same benefits. For the consumer, energy efficiency not only means a reduced demand for electricity, but also cheaper electricity from the utility, which can be provided more dependably due to decreased overall demand on the system.[113] Finally, for society as a whole, energy efficiency saves money, reduces the need for power plants, and reduces traditional air pollution and greenhouse gas emissions.[114] Again, it is easy to see how de-

effective when the cost of installing and maintaining measures that improve the efficiency of energy usage, compared with what the consumer would otherwise do, is less than the total cost of building, maintaining, and operating the generation, transmission, and distribution facilities that would otherwise be needed to supply enough energy to achieve the same end-use over the same lifetime. There are also environmental costs of both energy supply and some energy efficiency measures, which can and should be considered in measuring cost-effectiveness."); *Energy Efficiency As a Resource*, *supra* note 78.

110. CONN. GEN. STAT. § 16a-37x(a)(1) (2012) ("'Energy-savings measure' means any improvement to facilities or other energy-consuming systems designed to reduce energy . . . consumption and operating costs and increase the operating efficiency of facilities or systems for their appointed functions. 'Energy-savings measure' includes, but is not limited to, one or more of the following: . . . (B) Class I renewable energy or solar thermal systems.").

111. *SZ Enters.* Dist. Ct., *supra* note 5, at 18–19.

112. THE REGULATORY ASSISTANCE PROJECT, *supra* note 19, at 77; *Energy Efficiency As a Resource*, *supra* note 78 ("Efficiency can also improve system reliability and allow utilities to reduce or manage the demand on their systems—in some cases offsetting the need to add new peak generation capacity.").

113. THE REGULATORY ASSISTANCE PROJECT, *supra* note 19, at 77.

114. *Id.*; *Energy Efficiency As a Resource*, *supra* note 78 ("Reducing fossil fuel use has many additional benefits including reducing air pollution (and greenhouse gasses) and decreasing the environmental impacts associated with fossil fuel production and use.").

mand-side renewable generation facilities provide these same benefits, fitting neatly into the concept of energy efficiency.

Electric utilities face one key concern that creates a disincentive to embrace energy efficiency: reduced consumer demand means reduced sale volume and profit potential.[115] Conventional rate setting creates a conflict of interest, wherein the utilities are keen to encourage increased energy consumption, adverse to the public interest, in order to increase their sales and profits.[116] One of the primary ways states have tackled this concern is by a regulatory concept known as "decoupling."[117] This process begins with the standard rate determination based on the utility's required revenue to meet costs and return on investment.[118] In conventional rate setting, the rate then remains fixed, but in decoupling, rates are adjusted, based on variations in actual electricity sales, to ensure that the utility actually collects the required revenue; if sales dip below the expected level, rates increase to compensate.[119] By ensuring a dependable revenue stream sufficient to meet the electric utilities' needs, utilities no longer have an incentive to encourage increased energy consumption and can instead freely encourage energy efficiency and third-party PPAs.

3. Using Third-Party PPAs To Satisfy Renewable Portfolio Standards

Alongside energy efficiency standards, a number of states have also required their electric utilities to meet Renewable Portfolio Standards (RPS) by a certain deadline.[120] These policies require that a certain percentage of electricity come from renewable sources, thereby encouraging the electric utilities to

115. *Cf.* Howland, *supra* note 74 ("[U]tility revenue is tied to sales volume.").

116. *Cf. id.* ("[In 2014, u]tilities will push for changes while the solar industry will fight to maintain policies that support distributed generation.").

117. *See generally* REGULATORY ASSISTANCE PROJECT, REVENUE REGULATION AND DECOUPLING: A GUIDE TO THEORY AND APPLICATION 1 (2011), *available at* http://www.raponline.org/document/download/id/861 (describing how decoupling "breaks the link between the amount of energy sold and the actual (allowed) revenue collected by the utility").

118. *See* TOMAIN & CUDAHY, *supra* note 17, at 182–83.

119. THE REGULATORY ASSISTANCE PROJECT, *supra* note 19, at 61, 86–87.

120. *Renewable Portfolio Standard Policies*, DATABASE ST. INCENTIVES FOR RENEWABLES & EFFICIENCY (Sept. 2014), http://www.dsireusa.org/documents/summarymaps/RPS_map.pdf.

adopt renewable technologies.[121]

In order to further enhance the appeal of third-party PPAs to electric utilities, states can allow electricity generated from these PPAs to be counted towards meeting RPS requirements. This is a very attractive provision for electric utilities, allowing them to meet their RPS without the actual burden of having to oversee the construction and operation of renewable generation facilities, or having to purchase such power from other utilities or NUGs.[122] Renewable generation systems are already monitored to determine load output,[123] and, as discussed above, these systems are connected to the electrical grid to facilitate transfers of power between the consumer and the electric utility.

Utilities in many states can meet their RPS with Renewable Energy Certificates (RECs); each REC represents 1 megawatt-hour of electricity produced by a renewable generation facility.[124] However, most states require that RECs stay with the consumer who generates the solar power, allowing the consumer to sell the RECs.[125] These RECs are a key aspect in raising sufficient capital to overcome the primary hurdle of severe upfront capital costs for constructing renewable energy facilities, as the RECs are used to attract outside investors to help fund the construction.[126] In order to enhance the usefulness of RECs as a fundraising tool while simultaneously allowing utilities to

121. *Most States Have Renewable Portfolio Standards*, U.S. ENERGY INFO. ADMIN. (Feb. 3, 2012), http://www.eia.gov/todayinenergy/detail.cfm?id=4850.

122. William Atkinson, *Solar Leasing Shines*, PUB. UTIL. FORT., Mar. 2012, at 16, *available at* http://www.fortnightly.com/fortnightly/2012/03/solar-leasing-shines (noting that demand-side solar can "help utilities fulfill their obligations under renewable portfolio standards (RPS) without having to fund the capital costs themselves").

123. OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, U.S. DEP'T OF ENERGY, DOE/EE-0307, GUIDE TO PURCHASING GREEN POWER: RENEWABLE ELECTRICITY, RENEWABLE ENERGY CERTIFICATES, AND ON-SITE RENEWABLE GENERATION 28 (2010), *available at* http://www.epa.gov/greenpower/documents/purchasing_guide_for_web.pdf.

124. CORY ET AL., *supra* note 63, at 5.

125. *See, e.g.*, MD. CODE ANN., PUB. UTIL. COS. § 7-306(g)(5) (West 2013) ("An eligible customer-generator or the eligible customer-generator's assignee shall own and have title to all renewable energy attributes or renewable energy credits associated with any electricity produced by its electric generating system."); N.H. REV. STAT. ANN. § 362-A:9(IX) (2013) ("Renewable energy credits shall remain the property of the customer-generator until such credits are sold or transferred.").

126. *See* CORY ET AL., *supra* note 60, at 2; KOLLINS ET AL., *supra* note 19, at 3; *Solar Power Purchase Agreement Graphic*, *supra* note 58.

satisfy RPS requirements, some states offer RECs arising from third-party PPAs to be counted towards a utility's RPS requirements at double the conventional rate.[127] In effect, such statutes essentially invite utilities to help fund the construction of demand-side renewable generation facilities while still staying free of the obligations to oversee construction or perform maintenance and operation services.

4. Creating State-Sponsored Loan Programs and Facilitating Outside Financing

In order to further combat the challenges of high upfront capital costs, states can also make it easier for parties to acquire the necessary capital to build a solar panel facility. One of the primary ways states do so is through a state-sponsored loan program.[128] These loan programs can provide another tool for solar panel companies to acquire the necessary financing for the third-party PPA model's success. States can also use this loan program as a scaling tool for controlling the degree to which third-party PPAs are implemented in a state. In addition to the state-sponsored loans, it is helpful for states to enact provisions clarifying the permissibility of outside financing, further facilitating and streamlining the fundraising process.[129]

127. WASH. REV. CODE § 19.286.040(2)(b) (2012) ("A qualifying utility may count distributed generation at double the facility's electrical output if the utility: (i) Owns or has contracted for the distributed generation and the associated renewable energy credits; or (ii) has contracted to purchase the associated renewable energy credits."); *see* CORY ET AL., *supra* note 63, at 5 (discussing the value of renewable energy certificates).

128. *See, e.g.*, COLO. REV. STAT. § 24-38.7-102(4) (2012) ("'Clean energy loan' means a loan in a maximum amount of twelve thousand five hundred dollars originated by a participating public lender or a participating private lender, including but not limited to a bank or mortgage lender, to a qualified borrower for the purpose of financing one or more clean energy improvements to the borrower's primary residence, rental property, or place of business."); CONN. GEN. STAT. § 16a-37x(c) (2012) (giving the state agency responsibility for "assisting in the structuring or arranging of financing for energy-savings performance contract projects"); DEL. CODE ANN. tit. 29, § 8057(d)(1)(a) (2012) ("The Green Energy Endowment Program shall provide cash grants from the Green Energy Fund to customers that have constructed, purchased, leased or who have executed a power purchase agreement for renewable energy technology and have placed such renewable energy technology in service."). For more information on state-sponsored loan programs, see *Loan Programs*, *supra* note 98.

129. *See, e.g.*, CONN. GEN. STAT. § 16a-37x(i) ("A guaranteed energy-savings performance contract may provide for financing, including tax exempt financing, by a third party. The contract for third party financing may be separate from the energy-savings performance contract. A state agency or partici-

Because the upfront capital costs are already so severe, these financing measures are most effective when they are able to spread the repayment of these costs over long timeframes with low-interest rates.[130] Used in conjunction with all the other favorable financing and cost-saving measures discussed throughout this Section, consumers and third-party companies can continue to mitigate the challenge of high upfront capital costs.

5. Net Metering, the Sale of Surplus Electricity to the Utility, and Balancing Inequities

The final way in which states can ease the burden of capital costs is through the use of a fluid electricity transfer model, specifically by allowing the sale of the consumer's surplus generated electricity back to the utility.[131] As mentioned in Part I.C., a net metering law allows the consumer's excess electricity for one month to be credited against the consumer's potential future purchase of electricity from the utility.[132] Governing jurisdictions first establish that net metering is permissible in their state[133] and then set out the framework for their net metering policy.[134]

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pating municipality may use designated funds, bonds, lease purchase agreements or master lease for any energy-savings performance contracts, provided its use is consistent with the purpose of the appropriation.").

130. *Loan Programs*, *supra* note 98.

131. *See* WIEDMAN ET AL., *supra* note 13, at 6, 12 (discussing how net metering can help drive a solar market and stating that "[c]ustomer-generators realize the most financial benefit from net metering in this manner").

132. See *supra* Part I.C.

133. *See, e.g.*, 220 ILL. COMP. STAT. 5/16-107.5(i) (1993) ("All electricity providers shall . . . offer net metering."); D.C. MUN. REGS. tit. 15, § 901.1 (2010) ("Eligible customer-generators utilizing renewable resources . . . may elect and shall be afforded the opportunity to participate in net energy metering.").

134. *See, e.g.*, DEL. CODE ANN. tit. 26, § 1014(e)(1) (2012) (requiring Delaware's Commission to "[p]rovide for customers to be credited in kilowatt-hours (kWh), valued at an amount per kilowatt-hour equal to the sum of delivery service charges and supply service charges for residential customers and the sum of the volumetric energy (kWh) components of the delivery service charges and supply service charges for nonresidential customers for any excess production of their generating facility that exceeds the customer's on-site consumption of kWh in a billing period" and specifying that "[e]xcess kWh credits shall be credited to subsequent billing periods to offset a customer's consumption in those billing periods. At the end of the annualized billing period, a customer may request a payment from the electric supplier for any excess kWh credits. The payment shall be calculated by multiplying the excess kWh credits by the customer's supply service rate"); MD. CODE ANN., PUB. UTIL. COS. § 7-306(f)(5), (6) (West 2013) (allowing "eligible customer-generator[s]" to "ac-

Net metering, however, poses a problem of inequity for utilities and consumers who are not able to install solar panels (on their own or through a PPA), as compared with those consumers who can. This is because as the electric utility's total demand decreases, and some consumers even sell their surplus electricity back to the utility, the utility's dependable consumer base shrinks; therefore, the utility must shift its non-operating costs—primarily for the generation, transmission, and distribution infrastructures—to a more concentrated pool of consumers.[135] In effect, this leaves the less-fortunate consumers with the lion's share of the utility's non-operating expenses, increasing their electrical bill while the more-fortunate consumer's bill drops. A California study contests this argument,[136] but elsewhere states have sought to cap net metering in order to mitigate this negative externality. Many states do so by capping the cumulative capacity of all net metering operations as a percentage of the state's peak load capacity.[137] Connecticut takes

crue net excess generation for a period . . . not to exceed 12 months" and requiring the utility to "pay each eligible customer-generator for the dollar value of any accrued net excess generation remaining at the end of the previous 12-month period"); N.H. REV. STAT. ANN. § 362-A:9(V)(b) (2013) (allowing the customer to be paid for their excess electricity or have it be credited to counteract the customer's future consumption); D.C. MUN. REGS. tit. 15, § 902.3 ("[I]f the electricity generated during the billing period by the customer-generator's facility exceeds the customer-generator's kWh usage during the billing period (excess generation), the customer-generator's next bill will be credited by the Electric Company for the excess generation at the full retail distribution rate. The credit for excess generation shall be expressed as a dollar value on the customer-generator's bill. If the full credit for excess generation is not exhausted during the next billing period, the remaining credit shall be carried over until such time as the full credit has been exhausted.").

135. *Cf.* R. Thomas Beach & Patrick G. McGuire, *Evaluating the Benefits and Costs of Net Energy Metering in California*, CROSSBORDER ENERGY (Jan. 2013), *available at* http://votesolar.org/wp-content/uploads/2013/01/Crossborder-Energy-CA-Net-Metering-Cost-Benefit-Jan-2013-final.pdf (noting "recent claims by California's investor-owned utilities (IOUs) that the state's net energy metering (NEM) policy causes substantial cost shifts between energy customers with solar photovoltaic (PV) systems and other non-solar customers, particularly in the residential market").

136. *Id.*

137. DEL. CODE ANN. tit. 26, § 1014(e)(7) ("If the total generating capacity of all customer-generation using net metering systems served by an electric utility exceeds 5% of the capacity necessary to meet the electric utility's aggregated customer monthly peak demand for a particular calendar year, the electric utility may elect not to provide net metering services to any additional customer-generators."); 220 ILL. COMP. STAT. 5/16-107.5(j) (1993) ("An electricity provider shall provide net metering to eligible customers until the load of its net metering customers equals 5% of the total peak demand supplied by that electricity provider during the previous year."); NEV. REV. STAT. ANN.

an even more aggressive measure, requiring the third-party company to project the benefits of the installed facility, and penalizing the company for under- or over-estimating those benefits.[138] Effectively, instead of net metering, this establishes something of a strict matching principle between estimates and actual results, returning the spillover costs that the consumer is shifting to the utility back to the demand side of the equation.

States also attempt to mitigate the potential negative externalities of demand-side generation facilities by limiting the size of these facilities. Size determinations are generally set as a percentage of the consumer's historic use,[139] a strict wattage

§ 704.773(1) (LexisNexis Supp. 2013) ("A utility shall offer net metering . . . to the customer-generators operating within its service area until the cumulative capacity of all net metering systems operating in this State is equal to 3 percent of the total peak capacity of all utilities in this State."); R.I. GEN. LAWS § 39-26.4-3(a)(2) (2013) ("The aggregate amount of net metering in Rhode Island shall not exceed three percent (3%) of peak load."); 220 MASS. CODE REGS. 18.07(1)(a) (2012) ("Each Distribution Company shall make Net Metering services available to Host Customers such that the aggregate capacity of . . . Net Metering Facilities . . . does not exceed 3% of the Distribution Company's highest historical peak load.").

138. CONN. GEN. STAT. § 16a-37x(m) (2013) ("The energy-savings performance contract shall require the qualified energy service provider to provide to the state agency or participating municipality an annual reconciliation of the guaranteed energy cost savings. If the reconciliation reveals a shortfall in annual energy cost savings, the qualified energy service provider shall make payment to the state agency or participating municipality in the amount of the shortfall. If the reconciliation reveals an excess in annual energy cost savings, the excess savings shall remain with the state agency or municipality, and shall not be used to cover potential energy cost savings shortages in subsequent years or actual energy cost savings shortages in previous contract years.").

139. COLO. REV. STAT. § 40-2-124(1)(a)(VIII) (2013) ("'Retail distributed generation' means a renewable energy resource that is located on the site of a customer's facilities and is interconnected on the customer's side of the utility meter. In addition, retail distributed generation shall provide electric energy primarily to serve the customer's load and shall be sized to supply no more than one hundred twenty percent of the average annual consumption of electricity by the customer at that site."); NEV. REV. STAT. § 704.021(10)(b) (2013) (limiting generating capacity to "not more than 150 percent of that . . . person's requirements for electricity on an annual basis for the premises on which the individual system is located"); TEX. UTIL. CODE ANN. § 39.916(k) (West Supp. 2014) (requiring that "the estimated annual amount of electricity to be produced by the distributed renewable generation is less than or equal to the retail electric customer's estimated annual electricity consumption."); 4 COLO. CODE REGS. § 723-3 3652(ff) ("'Retail renewable distributed generation' means a renewable energy resource that is located on the premises of an end-use electric consumer [located within the service territory of a qualified retail utility] and is interconnected on the end-use electric consumer's side of the meter. . . .

cap,[140] or both.[141] A state-imposed wattage cap can limit the inequities between the solar-owning consumer, the conventional consumer, and the utility that is otherwise left at the mercy of the solar-owning consumer due to net metering. Wattage caps reduce the potential for spillover costs that may otherwise be shifted to the concentrated pool of conventional consumers by effectively turning demand-side generation into a program that removes these consumers from the utility's demand equation by zeroing-out their household demand.[142]

However, there are better options for states than imposing a wattage cap. States can ensure that consumers with third-party PPAs continue to pay their share of a utility's non-operating costs by cost shifting, allowing the utility to charge a fee for consumers' net metering benefits. Certain state regulatory commissions, notably Arizona's, have already acted to give utilities this power, allowing them to charge residential consumers with solar panel facilities a fee per kilowatt per month.[143] There is debate as to whether a flat charge, a rate-based system, or a "distributed generation premium" is the best mechanism,[144] but each of these options provides a channel to equitably return costs to consumers with third-party PPAs. Despite concerns from solar advocates that cost shifting impedes solar industry growth,[145] such cost shifting is appropriate be-

Retail renewable distributed generation shall be sized to supply no more than one hundred twenty percent of the average annual consumption of electricity by the end-use electric consumer at that site.").

140. 220 MASS. CODE REGS. 18.02 (2012) (capping eligible electricity prodders to "a plant or equipment that is used to produce, manufacture, or otherwise generate electricity and that is not a transmission facility and that has a design capacity of 60 kilowatts or less"); D.C. MUN. REGS. tit. 15, § 902.3 (2010) (limiting net metering to facilities with "capacity less than or equal to 100 kilowatts").

141. DEL. CODE ANN. tit. 26, § 1014(d)(1)(a), (5) (2012) (limiting such facilities to "a capacity of not more than 25 kW" for "residential customers" and requiring that they are "designed to produce no more than 110% of the host customer's expected aggregate electrical consumption, calculated on the average of the 2 previous 12-month periods of actual electrical usage at the time of installation of energy generating equipment").

142. *Cf.* Beach & McGuire, *supra* note 135.

143. Arizona Public Service Company, Docket No. E-01345A-13-0248, at 6, 29 (Arizona Corp. Comm'n Nov. 14, 2013), http://images.edocket.azcc.gov/docketpdf/0000149849.pdf.

144. *Id.* at 15–21.

145. *See* Herman K. Trabish, *Arizona Preserves Net Metering by Charging a Small Fee to Solar Owners*, GREENTECHSOLAR (Nov. 15, 2013), http://www.greentechmedia.com/articles/read/Charging-a-Fee-to-Solar-Owners-Preserves-Net-Metering-in-Arizona.

cause consumers with net metering continue to benefit from utilities' transmission and distribution infrastructure.[146] While states may want to mitigate the inequities that the privileged consumer imposes on the local utility and other residential consumers through peak load caps or wattage caps, states should consider simply increasing the degree of cost shifting that occurs during the net metering billing process. If a utility can continue to bill all consumers for non-operating costs, states do not have any incentive to limit the size of solar facilities for residential consumers with third-party PPAs; states actually have a disincentive to impose wattage caps, since these caps wastefully limit the revenue stream of third-party PPAs. In turn, reduced revenue streams will limit the number of third-party PPAs that are actually implemented, which will consequently reduce the benefits discussed above in Part II.A. Therefore, this Note advises against such wattage caps, instead encouraging cost-shifting provisions that allow utilities to continue billing privileged consumers for the utilities' non-operating costs.

6. Feed-In Tariffs

With legislation in place to ensure that all consumers pay for their utility's non-operating costs, states can continue to maximize the financial opportunities for third-party PPAs, and consequently the number of solar panel installations occurring. A useful mechanism to further enhance the third-party PPA is the feed-in tariff (FIT), under which a consumer sells electricity back to the utility at an agreed-upon rate, usually at a premium.[147] Sales at a premium increase the revenue streams for third-party PPAs, increasing their financial viability and allowing these PPAs to be adopted in greater numbers; studies have found well-adapted FITs to be among the most economically efficient and effective means of promoting renewable energy.[148]

146. *See* Christopher Martin, *Arizona Approves Grid-Connection Fees for Solar Rooftops*, BLOOMBERG POL. (Nov. 15, 2013, 11:24 AM), http://www.bloomberg.com/news/2013-11-15/arizona-regulators-impose-power-grid-fees-for-solar-roofs.html.

147. TOBY D. COUTURE ET AL., OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, U.S. DEP'T OF ENERGY, NREL/TP-6A2-44849, A POLICYMAKER'S GUIDE TO FEED-IN TARIFF POLICY DESIGN, at v (2010), *available at* http://www.nrel.gov/docs/fy10osti/44849.pdf; *Feed-In Tariffs*, NAT'L RENEWABLE ENERGY LABORATORY (Apr. 26, 2013), http://www.nrel.gov/tech_deployment/state_local_activities/basics_tariffs.html.

148. Commission Staff Working Document, Comm'n of the Eur. Cmtys., The Support of Electricity from Renewable Energy Sources, at 3 (Jan. 23, 2008), *available at* http://ec.europa.eu/energy/climate_actions/doc/2008_res_

These FITs generally have three key provisions, building on the ideas outlined for net metering and other aspects of third-party PPAs: (1) guaranteed access to the grid; (2) stable, long-term purchase agreements; and (3) payment levels based on the cost of the power source's generation.[149] Regarding payment levels, FITs are most effective when payments are designed to cover the cost of the project plus an estimated profit.[150] While FITs work in both conventionally-regulated and deregulated states, the details must be designed according to each state's regulatory structure, particularly to determine who awards payments for the FIT policy and how costs are distributed to various rate classes.[151] The most important challenge facing state-implemented FITs is federal preemption due to the Public Utility Regulatory Policies Act of 1978, which requires that sales of electricity to electric utilities from certain qualifying facilities must occur at avoided cost rates—that is, the price the utility would have had to pay to generate the electricity itself or purchase the electricity from another source.[152] Several states have supported FITs through a variety of means,[153] and have been mindful of this preemption issue, basing the premium tariff rate on avoided cost so as to avoid federal preemption.[154] Besides being constitutionally necessary, avoided-cost rates provide the benefit of serving as an equitable cap on the use of FITs; by preventing the tariff rate from being set at any more of a premium than the marginal cost of production would be, utilities increase their efficiency and pay no more to residential consumers than they would to any NUG facility.[155]

working_document_en.pdf; *cf.* Lincoln L. Davies & Kirsten Allen, *Feed-In Tariffs In Turmoil*, 116 W. VA. L. REV. 937, 938–42, n.5, n.6, & n.10 (2014) (criticizing the romanticizing of feed-in tariffs and advocating a realistic application of feed-in tariffs alongside other renewable energy methods).

149. COUTURE ET AL., *supra* note 147, at vi.

150. *Id.* at vii, 7.

151. *Id.* at 14; *see generally id.* at 92–98.

152. Public Utility Regulatory Policies Act of 1978, Pub. L. No. 95-617, 92 Stat. 3117, § 210.

153. *Feed-in Tariff: A Policy Tool Encouraging Deployment of Renewable Electricity Technologies*, U.S. ENERGY INFO. ADMIN. (May 30, 2013), http://www.eia.gov/todayinenergy/detail.cfm?id=11471.

154. *See* California Pub. Utils. Comm'n, 132 F.E.R.C. ¶ 61,047, at ¶¶ 65–67 (2010); *Feed-In Tariffs and Similar Programs*, U.S. ENERGY INFO. ADMIN. (June 4, 2013), http://www.eia.gov/electricity/policies/provider_programs.cfm (stating that Vermont sets rates with an "avoided-cost cap").

155. Beyond constitutional concerns, there are a number of additional nuances on how to appropriately structure FITs to improve their effectiveness. *See* Davies & Allen, *supra* note 148, at 997–1005.

In total, several states have sought to encourage the development of a new market for third-party PPAs. This has typically been accomplished through a comprehensive yet narrowly-tailored set of laws and regulations that help the third-party PPA model overcome its challenges while mitigating the potential for negative externalities.

III. THE ESSENTIAL PROVISIONS FOR ANY LAW ADDRESSING THIRD-PARTY POWER PURCHASE AGREEMENTS, AND HOW TO MAXIMIZE THEIR EFFECTIVE INCORPORATION INTO THE ELECTRIC UTILITY INDUSTRY

In nearly half the states in the country, the legal permissibility of third-party PPAs remains unknown.[156] This unregulated area presents an opportunity for economic and environmental benefits to all involved parties, and these states should address this burgeoning issue.[157] In so doing, however, legislators must recognize that regulation is a double-edged sword that can provide clarity and streamlining or leave parties stranded with problems created by other members of the market. Therefore, Part III of this Note provides a clear statement of how states can best structure their laws and regulations to maximize the benefits of third-party PPAs while minimizing potential negative externalities. Following each section are the statutory provisions that states should implement to facilitate third-party PPAs and maximize their effective incorporation into modern electricity regulation. Where possible, these statutory provisions draw on language that has proven successful for states supporting the third-party PPA model.

At the outset, states must first formally recognize and define the structure of a third-party PPA. This definition should specify that power generation occurs on the demand side of the meter. States seeking to enact a modest and narrowly tailored rule can specify that the power source is a solar facility (or a renewable energy facility), and ensure the source's connection to the electrical grid for transfers of power between the con-

156. *3rd-Party Solar PV Power Purchase Agreement (PPAs)*, *supra* note 7. Solar panel companies in deregulated states do not face the uncertainty of whether they can use the third-party PPA model, since a competitive retail market is the very idea of deregulation. Nevertheless, these states can still benefit from the various provisions that further enhance the third-party PPA model.

157. *See* Tracy, *supra* note 11.

sumer and the electric utility. All states should include provisions clarifying that these third-party generators are not electric utilities subject to regulatory licensing protocol or alter their current definition of electric utility to provide the same clarity. These clarifications and definitions provide solar panel companies with confidence that they can operate under an approved business model and streamline the process for all involved parties.[158]

Section 1. Definitions.[159]

(a) "Host" means the customer of a public utility who purchases the electric energy produced by an independent solar energy producer's solar energy distributed generation facility.

(b) "Independent solar energy producer" means a person employing one or more solar energy systems for the generation of electricity for any one or more of the following purposes:

(i) Its own use or the use of its tenants;

(ii) The use of, or sale to, not more than two other entities or persons per generation system, for use on the real property on which the electricity is generated, or on real property immediately adjacent thereto.

(c) "Solar energy distributed generation facility" means any configuration of solar energy devices that

(i) Shares a common point of connection with the public utility serving the area; and

(ii) Collects solar energy on the demand side of the facility's electric meter.

Section 2. Non-Utility Status of Persons Owning Solar Energy Distributed Generation Facilities.[160] A person not otherwise a public utility shall not be deemed to be a public utility solely because the person owns or controls all or any part of any solar energy distributed generation facility that:

(a) Is located on the host's site;

(b) Produces electric energy used at the host's site and sold to the host or the host's tenants or employees located at the host's site; and

158. *See* DUTZIK & SARGENT, *supra* note 104; KOLLINS ET AL., *supra* note 19, at 7–14.

159. *See* N.M. STAT. ANN. § 62-13-13.1.A, B (2012).

160. *See id.*; TEX. UTIL. CODE ANN. § 39.916(a)(2), (k) (West Supp. 2014).

(c) Shares a common point of connection with the public utility serving the area.

Section 3. Guaranteed Connection for Solar Energy Distributed Generation Facilities.[161]

(a) A public utility shall connect a solar energy distributed generation facility to the existing electricity distribution system within 90 days of a request by a host and an independent solar energy producer.

(b) A public utility that fails to connect a solar energy distributed generation facility to the public utility's distribution system is subject to fines of not more than $100 per day that the public utility is in violation of this section.

Next, states can increase the attractiveness of third-party PPAs and win over the electric utility constituency by allowing third-party PPAs to satisfy certain utility requirements. First, states can allow these demand-side generators to count towards utilities' energy efficiency requirements. States that have not enacted energy efficiency requirements should consider doing so, since energy efficiency is the most cost-effective way to manage energy demands.[162] Energy efficiency decreases consumers' demand for electricity, and allows the utility to save on transmission and distribution costs while remaining on the cheaper end of the merit order scale of power sources.[163]

In conjunction with these energy efficiency requirements, states should consider adopting a decoupling framework that provides utilities with a dependable revenue stream and eliminates their otherwise-existing incentive to discourage energy efficiency in order to maximize their sales. Secondly, states can allow for the electric utility to count demand-side renewable generation facilities towards their RPSs at twice the conventional rate of 1 REC per 1 megawatt-hour, providing benefits to both the consumer and the utility.

161. *See* S.P. 367, 126th Leg., 1st Reg. Sess. (Me. 2013), § 4423, *available at* http://www.mainelegislature.org/legis/bills/getPDF.asp?paper=SP0367&item=1&snum=126.

162. *See* THE REGULATORY ASSISTANCE PROJECT, *supra* note 19, at 26, 77; *Energy Efficiency As a Resource*, *supra* note 78.

163. *See* THE REGULATORY ASSISTANCE PROJECT, *supra* note 19, at 26, 77; *Energy Efficiency As a Resource*, *supra* note 78.

Section 4. Decoupling.[164] Electricity revenues shall be fully decoupled from sales pursuant to the provisions of this section.

(a) Prior to the beginning of each fiscal year, each public utility shall consult with the Public Utilities Commission and address the following categories:

(i) Capital spending on utility infrastructure;

(ii) Operation and maintenance expenses;

(iii) Any other costs relating to maintaining safety and reliability that are mutually agreed upon by the Commission and the public utility.

(b) The public utility shall file a proposed plan with the Commission for these categories of costs for the prospective fiscal year within 90 days.

(c) The Commission shall approve the proposed plan within 90 days if:

(i) The investments and spending are found to be reasonably needed to maintain safe and reliable distribution service over the short and long term; and

(ii) The rates are just and reasonable.

(d) The Commission may modify the proposed plan as necessary to meet the requirements of subsection (c).

Section 5. Applicability of Electricity From Solar Energy Distributed Generation Facilities Towards Energy Efficiency Standards. A public utility may count towards its energy efficiency target the share of electricity that a host uses from a solar energy distributed generation facility or sells to the public utility.

Section 6. Value of Renewable Energy Certificates.[165] A public utility may count electricity from a solar energy distributed generation facility at double the facility's electrical output if the utility:

(a) Owns or has contracted for the solar energy distributed generation facility and the associated renewable energy certificates; or

(b) Has contracted to purchase the associated renewable energy certificates.

164. *See* R.I. GEN. LAWS § 39-1-27.1 (2013).

165. *See* WASH. REV. CODE § 19.286.040(2)(b) (2012).

States can also maximize the effectiveness of third-party PPAs by establishing state-sponsored loan programs and guiding interested consumers towards the best financing methods available.[166] State-sponsored loans will be most useful when they provide for repayment over long timeframes with low-interest rates.[167] By specifying appropriate financing methods, states can also streamline fundraising to facilitate a thriving financing market within this niche.[168] Additionally, provisions supporting the use of third-party financiers can bring the financial industry to the aid of the third-party PPA model.

Section 7. State-Sponsored Loan Program for Solar Energy Distributed Generation Facilities.[169]

(a) The Commission shall establish a "Solar Energy Distributed Generation Facility Loan Fund." Such fund shall be used for the purposes of making and guaranteeing loans or deferred loans authorized under subsection (b) and may be used for expenses incurred by the Commission in the implementation of the program of loans, deferred loans and loan guarantees under this section.

(b) The Commission may, in its discretion, make low-cost loans or deferred loans to a host or independent solar energy producer for the financing, construction, installation, or maintenance of a solar energy distributed generation facility.

(i) Any such loan for a solar energy distributed generation facility shall be no more than is necessary to promote deployment of such facility.

(ii) Any such loan or deferred loan shall have a repayment period of at least 10 years.

(iii) Any such loan or deferred loan shall be exempt from taxation by the State and by the counties and municipalities of the State.

166. *See* CORY ET AL., *supra* note 60, at 2; KOLLINS ET AL., *supra* note 19, at 3.

167. *Loan Programs*, *supra* note 98.

168. *See* Cardwell, *supra* note 60.

169. *See* CONN. GEN. STAT. § 16a-40a (2012); DEL. CODE ANN. tit. 29, § 8057 (2012).

Section 8. Outside Financing for Solar Energy Distributed Generation Facilities.[170]

(a) In addition to or independent from any loans made under section 7, a host and the independent solar energy producer with which it contracts may also contract for third-party financing.

(b) Any host that is a state agency or municipality may use designated funds, bonds, lease purchase agreements, or a master lease, in addition to or independent from any loans made under section 7, provided its use is consistent with the purpose of the appropriation.

States should also provide a fluid electricity transfer model. In such a model, consumers can buy electricity from their public utility when their solar energy distributed generation facility is insufficient; they can also sell surplus electricity to the utility when the facility is producing in excess of the consumer's demand. By using a feed-in tariff to set the rate for sales to the public utility at a premium, states can expect to see the third-party PPA model be more successful.

However, states should also be prepared to face wary electric utilities, who will be forced to spread their non-operating costs among the reduced pool of consumers who are without third-party PPAs and who continue to purchase their electricity from the electric utility. This can be combated by allowing utilities to engage in cost shifting to return certain non-operating costs to consumers with third-party PPAs.

Section 9. Feed-In Tariffs.[171]

(a) The Commission shall by rule establish a solar energy distributed generation facility feed-in tariff program in order to encourage the rapid and sustainable development of solar energy distributed generation facilities.

(b) The Commission shall establish rates to provide revenue for the following purposes:

(i) To pay for current expenses for operating and maintaining the solar energy distributed generation facility;

170. *See* CONN. GEN. STAT. § 16a-37x(i).

171. *See* S.P. 367, 126th Legis., 1st Reg. Sess. (Me. 2013), § 4423, *available at* http://www.mainelegislature.org/legis/bills/getPDF.asp? paper=SP0367&item=1&snum=126.

(ii) To pay the annual principal and interest due of loans for the construction of the solar energy distributed generation facility;

(iii) To make up for the avoided cost, if any, of building or purchasing additional nonrenewable generated electricity;

(iv) To pay for any and all other reasonable costs and expenses related to generating electricity by the solar energy distributed generation facility;

(v) To pay a minimum annual return of at least 8% and not less than 10% to an efficiently designed solar energy distributed generation facility for contracts initiated in the first 2 years after [the date of enactment]. Thereafter, every 2 years, the commission may reduce the minimum annual return by 0.5%.

(c) The Commission shall adopt rules by [the date of enactment] for the design of the rates under this section.

(d) The Commission shall, after notice and hearing, biannually establish a solar energy factor that must be a nonbypassable surcharge payable by every customer of a public utility. The surcharge must be payable by all customer classes. The commission shall set the surcharge at a level sufficient to pay the costs of electricity purchased under subsection (b) and any interconnection costs under section 3(a). For the purpose of this section, "nonbypassable surcharge" means charges applied to all customer billings in a given region whether they receive service from a local utility or from a competitive supplier. These charges include transition charges, access charges, regional levies and taxes. The surcharge is payable by all suppliers on a kilowatt-usage basis.

(e) The Commission shall review the rates established in subsection (b) by [one year after the date of enactment] and every 2 years thereafter and adjust those rates for new contracts as necessary to account for inflation, assist in the profitable development of solar energy distributed generation facility, and prevent uneconomical costs to ratepayers. The commission may reduce the rates in subsection (b) to reflect any federal or state subsidies, tax credits or other incentives that a solar energy distributed generation facility may receive.

Section 10. Cost Shifting. The Commission shall establish a mechanism so that a host pays its equitable portion of a public utility's non-operating costs. Specifically, such mecha-

nism shall require each host to pay the difference between the amount the utility pays to purchase the electricity from the host and the amount the utility would pay to acquire the same amount of solar via a wholesale power purchase agreement.

While many states across the country have enacted certain aspects of these proposed solutions, there has not yet been a comprehensive legislative framework facilitating the success of the third-party PPA model. This Note provides the first summary analysis and statement of what issues states need to consider to encourage the third-party PPA model, and how states can navigate those issues to maximize the value of this niche market.

CONCLUSION

The modern energy industry is a dynamic marketplace that has developed far beyond the traditional vertically integrated electric utility. Power generation has been severed from transmission and distribution services. Concurrently, environmental concerns and a push for energy security have put a spotlight on renewable energy sources. Besides utility-size solar panel facilities, solar panel companies are also making sales to individual consumers through the innovative third-party power purchase agreement business model.

However, this model rests on the premise that the solar panel company sells electricity to the consumer, much like a regulated electric utility. In nearly half of the states in the country, it remains unclear whether this is a permissible business model. While some solar panel companies are foraying into these untested markets, there has not been the widespread market penetration that exists in states with favorable third-party PPA policies. This has left many of these states sitting on the sideline while other states cash in on the renewable energy construction boom. Those states that remain inactive players can get in on the action by passing third-party power purchase agreement laws that legitimize and define the scope of this business model. In light of the fact that there is a right way and a wrong way to regulate business, these laws should be conscientiously drafted to facilitate a streamlined approach that incorporates energy efficiency and renewable portfolio standards while mitigating the potential for negative externalities that shift costs to innocent bystanders. If states adopt the statutory provisions suggested in this Note, they can foster a new area of

business within their state, develop responsible twenty-first century utility regulation, allow consumers to save on electricity, and reduce traditional air pollutant and greenhouse gas emissions.