

THE REGULATORY CHALLENGE OF DISTRIBUTED GENERATION

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I. Introduction

Recent published reports point toward a growing conviction that the demand for utility service from the U.S. electric grid may soon decline, perhaps substantially, due to the expanding use of distributed generation.¹ One report prepared by a division of Citigroup describes the improving economics of distributed solar power, which the authors expect will continue.² A second Citigroup report projects reductions in the demand for utility service in developed markets of up to fifty percent by 2050.³ Favorable projections for distributed generation, however, depend on assumptions about technological change that may turn out to be overstated, and even if distributed generation grows substantially, millions of homes and businesses will continue to rely on the electric grid for many decades.⁴

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¹ E.g., Diane Cardwell, *On Rooftops, a Rival for Utilities*, N.Y. TIMES, July 26, 2013, <http://www.nytimes.com/2013/07/27/business/energy-environment/utilities-confront-fresh-threat-do-it-yourself-power.html>; Peter Kind, *Disruptive Challenges: Financial Implications and Strategic Responses to a Changing Retail Electric Business*, EDISON ELECTRIC INSTITUTE (Jan. 2013), www.eei.org/ourissues/finance/Documents/disruptivechallenges.pdf.

² Citi Research, *Rising Sun: Implications for US Utilities* (Aug. 8, 2013), <http://www.wecc.biz/committees/BOD/TEPPC/SPSG/Lists/Events/Attachments/706/CITI-Rising%20Sun%20Implications%20for%20US%20Utilities.pdf>.

³ Jason Channell et al., *Energy Darwinism: The Evolution of the Energy Industry*, CITI GLOBAL PERSPECTIVES & SOLUTIONS 73-75 (Oct. 2013), <https://ir.citi.com/Jb89SJMmf%2BsAVK2AKa3QE5EJwb4fv15UUpID0iCiGOOk0NV2CqNI%2FPDLJqxidz2VAXXAXFB6fOY%3D>.

⁴ Even if Citi's aggressive prediction of fifty percent demand reduction by 2015 turns out to be

Germany has gone further to promote distributed generation⁵ than any other industrialized nation, and its experience provides a cautionary tale. More than a decade after Germany initiated its *Energiewende*,⁶ the average residential price for electricity is almost 36 cents per kWh,⁷ and rates are projected to rise another thirty to fifty percent in the next ten years.⁸ Without a change in policy, German residential electric rates may therefore approach 50 cents per kWh by the end of this decade. In contrast, the average residential rate in the U.S. is approximately 12.5 cents per kWh.⁹ Because the average U.S. residence uses approximately 1,000 kWh of electricity per month,¹⁰ the current German rate would be equivalent to an average household tax of \$3,000 per year. Rates anywhere near the levels being experienced in Germany would be unacceptable in the U.S.¹¹

accurate, that prediction leaves fifty percent of electric load dependent on grid service.

⁵ In this Article, references to “distributed generation” refer to energy sources located behind the retail meter or connected to a micro grid, where the intent is to remove some load or demand from the system of integrated electric generation, transmission, and distributed facilities that comprise what is referred to in this Article as the “grid.”

⁶ *Energiewende*, or energy transformation, is the product of the German Renewable Energy Act of 2000 (*Erneuerbare-Energien-Gesetz*) that put in place substantial subsidies for distributed generation and grid-connected renewables. See *General Information: Transformation of Our Energy System*, GER. FED. MINISTRY FOR THE ENV’T, NATURE CONSERVATION AND NUCLEAR SAFETY, www.bmu.de/P118-1/ (last visited Nov. 24, 2013).

⁷ Jesse Morris, *How Germany’s Solar Evolution Impacts America*, EARTH TECHLING (Oct. 12, 2013), <http://www.earthtechling.com/2013/10/how-germanys-solar-evolution-impacts-america>. Ironically, this article laments the fact that the German feed-in tariff rate for distributed solar is only 20 cents per kWh, well below the full retail rate.

⁸ Institute for Energy Research, *Germany’s Energy Policy: Man-Made Crisis Now Costing Billions* (Oct. 30, 2012), <http://www.instituteforenergyresearch.org/10/20/2012>. Many Germans claim they can no longer afford to buy electricity. *Germany’s Energy Poverty: How Electricity Became a Luxury Good*, SPIEGEL ONLINE INT’L (Sept. 4, 2013), <http://www.spiegel.de/international/germany/high-costs-and-errors-of-german-transition-to-renewable-energy-a-920288.html>.

⁹ Energy Info. Admin., Table 5.6.A. Average Retail Price of Electricity to Ultimate Customers by End-Use Sector, (Nov. 20, 2013), http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_5_6_a.

¹⁰ Energy Info. Admin., How Much Electricity Does an American Home Use?, <http://www.eia.gov/tools/faqs/faq.cfm?id=97&t=3> (last updated Mar. 19, 2013).

¹¹ Germany’s Environment Minister, Peter Altmaier, has acknowledged that Germany has overdone the subsidies and needs to cut them back. Diarmaid Williams, *Altmaier says German energy transition could cost \$1.34trn*, POWER ENERGY INTERNATIONAL (Feb. 21, 2013), <http://www.powerengineeringint.com/articles/2013/02/Altmaier-says-German-energy-transition-could-cost-134trn.html>; *Minister Altmaier: EEG Cuts Needed—or Energiewende Costs Will Reach Trillion Euro Mark by 2040*, GERMAN ENERGY BLOG (Feb. 20, 2013), <http://www.germanenergyblog.de/?p=12278>.

Even with extraordinarily high and increasing electric rates, aggregate carbon dioxide emissions by the German electric sector are rising.¹² In contrast, U.S. emissions are falling even though renewables constitute a much smaller percentage of the electric energy mix in the U.S.¹³ The stability of the German grid is also being put at risk: it has relied more heavily on variable, renewable generation at the same time that grid resources capable of rapidly balancing supply and demand have been shutting down due to anomalous market price signals.¹⁴ *Energiewende* has also taken a toll on the utility companies that may have to make the grid investments to fix these operating problems. Equity values for Germany's biggest utilities have fallen by fifty percent or more over the past three years.¹⁵

While Germany struggles with *Energiewende*, the growth of distributed generation in the U.S. is being fueled by a controversial regulatory practice known as net metering. If distributed generation comes to play a significant role, the loss of demand for service from the grid may eventually make it difficult for the owners of grid assets to recover their costs, creating what the utility industry calls "stranded costs." This Article explores the debate over net metering and then turns to the longer-term prospect of having to address potential stranded costs produced by the expanded use of distributed generation.

II. Net Metering: The Current Battlefield

Most renewable generation in the U.S. is subsidized through investment or production tax credits.¹⁶ This Article focuses on an additional subsidy to distributed renewable generation alone that exists as a result of "net metering" as applied in about forty states. Under net metering, retail customers (including commercial and industrial customers) can offset their electricity purchases from the grid with energy generated

¹² Spiegel Online Int'l, *supra* note 8; Max Luke, Jessica Lovering & Alex Trembath, *Trash, Trees and Taxes: The Cost of Germany's Energiewende*, ENERGY COLLECTIVE (Sept. 16, 2013), <http://theenergycollective.com/maxluke/274041/trash-trees-and-taxes>.

¹³ An environmental critique of *Energiewende* can be found in Will Boisvert, *Green Energy Bust in Germany*, DISSENT (2013), <http://www.dissentmagazine.org/article/green-energy-bust-in-germany>.

¹⁴ *Tilting at Windmills*, ECONOMIST, June 15, 2013, available at <http://www.economist.com/news/special-report/21579149-germanys-energiewende-bodes-ill-countrys-european-leadership-tilting-windmills>.

¹⁵ *How to Lose Half a Trillion Euros*, ECONOMIST, October 12, 2013, **ERROR! BOOKMARK NOT DEFINED.** available at <http://www.economist.com/news/briefing/21587782-europes-electricity-providers-face-existential-threat-how-lose-half-trillion-euro>.

¹⁶ German subsidies primarily take the form of "feed in tariffs" that guarantee minimum per kWh payments to those employing favored technologies, which are paid out of a pool funded by consumers. See Stefan Nicola, *German Industry Wants End of Feed-in Tariff on Rising Power Cost*, BLOOMBERG (Sep 19, 2013, 5:53 AM), <http://www.bloomberg.com/news/2013-09-19/german-industry-wants-end-of-feed-in-tariff-on-rising-power-cost.html>.

behind the retail meter, such as from rooftop solar panels. In most of the states that allow net metering, the credit equals the bundled retail rate. The credit applies not only to foregone consumption but also—with limited exceptions—to the energy generated from behind the meter in excess of the customer’s own use and delivered to the utility.¹⁷

Net metering therefore values the energy produced by distributed generators at the bundled retail rate for electricity. The bundled retail rate includes, in addition to the cost of producing electric energy, the costs associated with investment in and operation of transmission and distribution facilities and other costs incurred to ensure reliability and fund public policy initiatives endorsed by utility regulators. As noted above, the average residential price of electricity (the average bundled rate) is currently around 12.5 cents per kWh.¹⁸ According to published data as of November 2013, the market price of energy from grid-connected¹⁹ generators is averaging, in most locations, between 2 and 3 cents per kWh during off-peak periods and between 4 and 5 cents per kWh during on-peak periods.²⁰ Recent sales of grid-connected renewable energy have been priced near or below 3 cents per kWh.²¹ Therefore, net metering allows the owners of distributed generation to effectively sell their energy at prices between two and six times the market price for energy.

Grid-connected renewable generators are paid the much lower market price for their energy, so the issue is not, as advocates of distributed generation allege, merely about promoting “clean” energy. A grid-connected solar generator at the same location as a distributed solar generator receives a fraction of the compensation for providing energy using similar—and equally clean—technology.²² Grid-scale solar generation is actually more efficient, so net metering provides a huge subsidy to a less efficient form of

¹⁷ As discussed below, the Federal Energy Regulatory Commission (FERC) has disclaimed jurisdiction over energy supplied from behind-the-meter distributed generation so long as the customer does not supply more excess energy than it acquires from the grid over the course of a monthly retail billing period.

¹⁸ Energy Info. Admin., Table 5.6.A, *supra* note 9.

¹⁹ This Article refers to generators that are connected on the utility side of the customer meter as “grid-connected generation” for ease of reference. This is a misnomer, however, because all generation, including generation located on a retail customer’s property on the customer side of the meter, is connected to and part of the electric grid. Electricity does not recognize the difference in location; at all times sufficient energy must be supplied to meet the aggregate demand of all users, and the system must be kept in precise balance (supply equaling demand) in order to prevent outages and serious damage to facilities.

²⁰ See Platts, MEGAWATT DAILY, at 2-10 (November 27, 2013).

²¹ American Wind Energy Association, *The Cost of Wind Energy in the U.S.*, <http://www.awea.org/Resources/Content.aspx?ItemNumber=5547> (last visited Nov. 24, 2013).

²² The analysts at Citi put it succinctly: “While residential solar has the advantage of competing against higher residential electricity prices, merchant utility scale solar must compete against wholesale power prices.” Citi Research, *supra* note 2 at 21.

renewable energy.

Utilities point out that the differential is paid by other retail customers. Because virtually all retail service is billed based on energy usage, net metering causes a re-allocation of transmission, distribution, and reliability costs to those customers who do not own distributed generation. Yet, the owners of distributed generation continue to rely on utility service from the grid for back-up and supplemental energy (for example, at night and when it is cloudy). Presently, the use of distributed generation in the U.S. is sufficiently limited that the cost-shifting effects are minor. However, subsidies this large can induce rapid changes. A report recently issued by the California Public Utilities Commission forecasts that net metering will cost the State \$1.1 billion per year in 2020.²³ It also finds that the average net metering customer in California has an income almost twice the state's average,²⁴ confirming claims that net metering entails a wealth transfer from low- to high-income consumers.

Net metering raises a number of legal issues that are just beginning to be explored. The definition of "net metering service" in the Energy Policy Act of 2005 indicates that Congress did not endorse the subsidy described above.²⁵ Section 111(d)(11) of the Public Utility Regulatory Policies Act (PURPA)²⁶ was added in 2005 to a list of retail ratemaking practices that state utility commissions are required to evaluate for use in their jurisdictions. This provision defines "net metering service" as follows:

Net Metering – Each electric utility shall make available upon request net metering service to any electric consumer that the electric utility serves. For purposes of this paragraph, the term "net metering service" means service to an electric consumer under which electric energy generated by that electric consumer from an eligible on-site generating facility and delivered to the local distribution facilities may be used to offset energy provided by the electric utility to the electric consumer during the applicable billing period.²⁷

²³ See Cal. Pub. Utils. Comm'n, CALIFORNIA NET ENERGY METERING (NEM) DRAFT COST-EFFECTIVENESS EVALUATION (2013), available at <http://www.cpuc.ca.gov/NR/rdonlyres/BD9EAD36-7648-430B-A692-8760FA186861/0/CPUCNEMDraftReport92613.pdf>.

²⁴ *Id.* at 110.

²⁵ Energy Policy Act of 2005, Pub. L. No. 109-58, sec. 1251, § 111(d), 119 Stat. 962 (codified as amended at 16 U.S.C. 2621(d)(11)).

²⁶ See *id.*; Pub. Util. Reg. Policies Act of 1978, Pub. L. No. 95-617, § 111(d), 92 Stat. 3117, 3142-43 (codified as amended at 16 U.S.C. § 2621(d)(10)(E)(11) (2006)).

²⁷ Energy Policy Act § 111(d); 16 U.S.C. § 2621(d)(10)(E)(11).

Under this definition, “electric energy” generated by a retail customer’s on-site facility may be used to offset “energy” provided by the utility. The language strongly implies that Congress meant only to ensure that consumers would receive an appropriate credit for the energy supplied from on-site generation and not a credit based on the bundled retail rate that includes costs associated with transmission, distribution, and reliability. If this is correct, net metering as applied in most states is inconsistent with this part of PURPA.²⁸

In 2002, the Supreme Court of Ohio addressed this very issue in connection with interpreting Ohio legislation that required public utilities to offer net metering.²⁹ In that case, FirstEnergy proposed a net metering regime under which net metered customers would receive a credit for energy supplied from on-site generation based on the unbundled generation component of the retail rate.³⁰ This proposal was rejected by the Ohio Public Utilities Commission, which directed that FirstEnergy offer a credit based on the full bundled retail rate.³¹ The Ohio Supreme Court held that FirstEnergy had correctly applied statutory language requiring utilities to provide a credit for the “electricity” produced by on-site generators by offering to credit only the generation component of the retail rate.³² The Court found that FirstEnergy was correct in contending that a net meter customer “does not provide transmission, distribution or ancillary services,” and therefore the term “electricity” in the statute did not require a credit for the costs associated with these other unbundled services.³³

Net metering also appears to be inconsistent with provisions of PURPA that were designed to protect electric consumers from cross-subsidization. Under PURPA, utilities are required to purchase energy from qualifying “small power production” facilities that meet eligibility standards established in the law.³⁴ Under FERC regulations, retail customers that own on-site generators with a maximum net generating capacity of less than 1 MW are permitted to self-implement PURPA’s mandatory purchase requirement

²⁸ Congress also did not define what it meant by “delivered to the local distribution facilities” in this provision. It may have intended the energy credit to apply only to energy in excess of the customer’s on-site use, or it may have intended that all energy produced on-site be treated as energy provided to the grid because all such energy substitutes energy that would otherwise be supplied from the grid. Either way, the definition provides only for an energy credit, which is not what occurs in most jurisdictions.

²⁹ *FirstEnergy Corp. v. Pub. Utils. Comm’n of Ohio*, 768 N.E.2d 648 (Ohio 2002).

³⁰ *Id.* at 650.

³¹ *Id.*

³² *Id.* at 652.

³³ *Id.*

³⁴ Pub. Util. Reg. Policies Act § 210 (codified at 16 U.S.C. § 824a-3(a) (2006)). FERC regulations refer to these as “qualifying facilities.” 18 C.F.R. § 292.101(b)(1).

without any notification to or approval from FERC.³⁵ Most retail customers using net metering rely on the mandatory purchase requirement to require their host utilities to purchase their energy.³⁶ Absent the PURPA requirement, utilities would generally have no obligation to buy energy from distributed generators because the Federal Power Act³⁷ (the law that applies in the absence of PURPA) does not obligate utilities to purchase energy at wholesale.³⁸

PURPA, however, while requiring utilities to buy, also caps the price paid to qualifying facilities at the purchasing utility's "avoided cost," which is defined as the cost of energy that would have been supplied from the utility's own system if the energy had not been supplied by the qualifying facility.³⁹ Because net metering compensates owners for the energy supplied from distributed generation at the utility's bundled retail rate, this practice would appear to violate the avoided cost rate cap that is based on the cost of energy alone.

The FERC, however, permits net meter customers to avoid this price cap. The FERC holds that unless a retail customer with on-site generation is a *net* supplier of energy to the grid over the state retail billing period (almost always one month), no sale takes place under PURPA or the Federal Power Act, even if there are substantial deliveries of energy to the grid during the month.⁴⁰ In the absence of a "sale" to the utility, FERC deems that no mandatory purchase of energy is taking place under PURPA and the avoided cost price cap does not apply.⁴¹

The FERC's theory, that the existence of a "sale" can be determined by netting metered inflows and outflows over the course of a month, was recently rejected in two appellate cases involving FERC's use of this same theory to determine whether a retail sale has occurred when generators acquire energy for station service purposes, the mirror

³⁵ 18 C.F.R. § 292.203(d) (2010).

³⁶ See Stephanie Watson, *How Net Metering Works*, HOW STUFF WORKS, <http://science.howstuffworks.com/environmental/green-science/net-metering2.htm> (last visited Nov. 24, 2013).

³⁷ 16 U.S.C §§ 791a-825r.

³⁸ From the earliest days of Federal Power Act jurisprudence, courts have emphasized that wholesale power transactions under the Federal Power Act are voluntary. *Fed. Power Comm'n v. Sierra Pac. Power Co.*, 350 U.S. 348 (1956). In organized Regional Transmission Organization (RTO) markets, any generator that signs a service agreement with RTO is permitted to bid its energy into the market and, if dispatched, gets paid the locational marginal cost of energy, even if the generator does not have a contract with a specific buyer.

³⁹ *Am. Paper Inst. v. Am. Elec. Power Serv. Corp.*, 461 U.S. 402, 404 (1983).

⁴⁰ See *MidAmerican Energy Co.*, 94 F.E.R.C. P 61,340 (2001); *Sun Edison LLC*, 129 F.E.R.C. P 6,1146 (2009).

⁴¹ *Id.*

image of the net metering situation.⁴² In these two cases, the D.C. Court of Appeals held that netting could not be used to determine whether a sale has taken place and that there is a sale whenever energy is delivered from the generator to the utility and vice versa.⁴³ The FERC's disclaimers of jurisdiction in *MidAmerican* and *SunEdison* may therefore be subject to a renewed challenge, which, if successful, would require net metering rules to be changed at the state level.

This same "netting" theory allows FERC to avoid facing the fact that the prices inherent in net metering are discriminatory. The Federal Power Act prohibits charges for wholesale energy that are "unduly discriminatory,"⁴⁴ but this prohibition only applies if there is a FERC-jurisdictional wholesale transaction. *MidAmerican Energy* and *SunEdison* therefore provide a rationale for FERC to avoid addressing the huge differential between the prices paid to distributed and grid-connected generators for the energy they supply.

From both economic and environmental perspectives, energy from distributed generation is no more beneficial than other forms of renewable generation. Energy available to meet electric load, whether generated behind the retail meter or from grid-connected generation, provides equivalent value to the electric system. Therefore, the price discrimination inherent in net metering cannot be justified based on differences in the value of the services offered. If anything, distributed solar is less valuable than most energy from grid-connected generators because the energy output of solar facilities varies uncontrollably. Consequently, utilities must have sufficient grid-connected capacity on hand to supply the entire load when solar generation is non-productive. For the same reason, retail customers with distributed generation require access to grid-supplied energy up to their full load at unpredictable times.⁴⁵ Indeed, solar generation has a pernicious effect on energy markets because energy from solar generators tends to suppress energy market prices during peak-load periods, providing less revenue for grid-connected

⁴² See *S. Cal. Edison Co. v. FERC*, 603 F.3d 996 (D.C. Cir. 2010); *Calpine Corp. v. FERC*, 702 F.3d 41 (D.C. Cir. 2012).

⁴³ See *S. Cal Edison Co.* 603 F.3d at 1000-01; *Calpine Corp.* 702 F.3d at 45.

⁴⁴ 16 U.S.C. § 824e(a).

⁴⁵ California is attempting to overcome this issue by requiring utilities to purchase storage capacity using new technologies to help balance supply and demand. Order Instituting Rulemaking Pursuant to Assembly Bill 2514 to Consider the Adoption of Procurement Targets for Viable and Cost-Effective Energy (published October 17, 2013), Cal. Pub. Utils. Comm'n, 2013 Cal. PUC LEXIS 569, available at <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M078/K912/78912194.PDF>. Whether these alternative technologies will become available in sufficient quantities and at a reasonable cost to replace balancing generation from the grid, and how long this may take, is unknown.

generation and falsely signaling to the market that grid-connected generation that is needed for reliability is no longer economic.⁴⁶

In conclusion, net metering as currently practiced in most states provides a huge subsidy to distributed generators over and above the tax subsidy provided to all renewable generation, discriminates against all forms of grid-connected generation (including renewables), forces an inappropriate re-allocation of the costs of the grid to remaining (and disproportionately lower income) customers, and sends a faulty price signal that can cause under-investment in (or early shut down of) grid-connected generation that is needed for real-time balancing purposes and to meet peak demands. These same problems—in larger scale—are among the primary causes of Germany's growing dysfunction.

III. The Return of Stranded Costs

Broadly speaking, the current dispute over net metering is about managing the growth of distributed generation during the period when growth is being fueled by subsidies. If projections such as those made by Citigroup are correct, the cost of energy from distributed generation will decline, eventually making it competitive with energy from the grid without subsidies, and the pace of growth will accelerate. At some point, distributed generation could be married to behind-the-meter storage capability, permitting customers to disconnect from the grid or significantly limit their use of utility service. Investments in distributed generation combined with storage should expand rapidly when and if the combined cost of distributed energy and storage reaches parity with the cost of bundled service from the grid.

In this scenario, as the demand for service from the grid declines and utilities need to recover the cost of the grid from a smaller customer base, utilities will have to respond by filing to raise rates. While this is occurring, a large body of customers will remain dependent on electricity from the grid for a considerable period of time since many customers may not have the resources to install distributed generators and others may choose to take their electric service from the grid.

Even as this possible transition approaches, billions of dollars of grid investments

⁴⁶ The *Economist* notes: "Renewables can depress wholesale prices, e.g. when the sun creates a midday jolt. This discourages investors in the flexible, gas-powered generation needed to provide backup for windless, cloudy days." *Energiewinde*, *ECONOMIST*, July 28, 2012, at 3. Citi Research, noting that solar production causes lower utilization rates for conventional generation plants, concludes: "This would in a perfect economic world lead to the closure of some higher heat rate gas plants, but the problem of course is that much of this generation capacity needs to remain to cover lost generation on less sunny days and at night, and through the winter . . ." Citi Research, *supra* note 2, at 17.

are being made, mostly in response to regulatory mandates.⁴⁷ As the use of distributed generation grows, investors in grid assets will demand that regulators provide assurance that their investments will be recoverable over time with a reasonable return. Otherwise, the cost of capital will rise, exacerbating the problem of rising rates during the transition, and in a worst case making it impossible for utilities to raise the capital needed to serve remaining customers and compensate investors for their prior investments in the grid.

Around the turn of the century, the utility industry faced the prospect that investments in generation might be unrecoverable. In those jurisdictions that permitted “retail choice” of electricity suppliers, utility generation was unbundled and re-priced to market. This competitive transformation produced debates over whether utilities were entitled to recover the costs associated with prior generation investments from departing customers when sunk costs exceeded the revenues recoverable at market prices. The differential was known as “stranded costs.”

Utilities argued that they were entitled by law to recover their stranded costs pursuant to an implicit bargain with the government under which utilities had assumed an obligation to serve the public in return for assurance that they would be compensated for their prudent investments made to meet that obligation. Along with many scholars, utilities argued that the law recognized this “regulatory compact” and that failure to permit the recovery of stranded costs represented an unconstitutional taking of utility property.⁴⁸ Others argued that no such legal right exists and that allowing utilities to recover their stranded costs would be inconsistent with the transition to competition.⁴⁹

In the states that endorsed retail choice, legislative or regulatory compromises were reached in which utilities recovered most of their stranded costs. The underlying legal question was never resolved decisively in the courts. The stranded cost issue will be different in the context of utility loss of demand to distributed generation. In this context, stranded cost issues will not appear at one point in time (such as a legislative

⁴⁷ For example, the electric industry is investing significant sums in response to state laws imposing renewable portfolio standards. Large additional investments are being made to modernize the transmission and distribution systems and incorporate so-called “smart grid” technologies. One utility executive recently noted that half the existing transmission grid is more than fifty years old, so sizable investments to sustain it are inevitable. Lisa Barton, *IHS The Energy Daily*, September 26, 2013, at 14. Several northeastern states are requiring utilities to invest in “hardening” their systems in response to recent storm-related outages. See Diana Cardwell et al., *Hurricane Sandy Alters Utilities’ Calculus on Upgrades*, N.Y. TIMES, Dec. 28, 2012, at B1. Since 2005, the utility industry has also been subject to mandatory reliability standards approved by the FERC that require significant ongoing investments in the grid. 16 U.S.C. § 824o (2005).

⁴⁸ See, e.g., J. Gregory Sidak & Daniel F. Spulber, *Deregulatory Takings and Breach of the Regulatory Contract*, 71 N.Y.U. L. REV. 851 (1996).

⁴⁹ See, e.g., Susan Rose-Ackerman & Jim Rossi, *Disentangling Deregulatory Takings*, 86 VA. L. REV. 1436 (2000).

determination to permit retail customer choice) but will emerge gradually as utilities and regulators respond to reductions in aggregate demand for utility service. The stranded cost issue may also include stranded investment in transmission and distribution assets as well as generation. Further, stranded cost recovery will have to be addressed in the context of a declining utility customer base that may ultimately become too small to support recovery. In the last round of stranded costs, customers changing power suppliers remained as transmission and distribution customers of the utility and stranded costs could be recovered in the rates for these unbundled services.

A. Cost Recovery for Regulated Assets

Assuming distributed generation becomes economical without subsidies, retail customers will be making independent decisions about whether to reduce or jettison utility service, and these decisions will occur over time as the relative economics of grid-produced and distributed electricity change. The stranded cost issue is therefore likely to arise in individual rate proceedings as utilities file to increase their rates to offset the effects of declining demand and regulators respond by requiring offsetting cost reductions to cabin these rate increases to remaining captive customers. As this process unfolds, history teaches that there will be disputes over the prudence of past utility expenditures and over whether particular assets remain “used and useful” and thus eligible for cost recovery.

The Supreme Court’s decision in *Duquesne Light Co. v. Barasch* holds that a utility’s Constitutional right to recover its costs to serve the public is not infringed by regulatory decisions disallowing individual items of cost.⁵⁰ An unlawful “taking” occurs only when the *overall* level of rates produces insufficient revenue to satisfy the “end-result” test established in *FPC v. Hope Natural Gas Co.*⁵¹ *Hope* held that overall rate levels “which enable a company to operate successfully, to maintain its financial integrity, to attract capital, and to compensate its investors for the risk assumed . . .” are sufficient to pass Constitutional muster.⁵² The *Hope* test is fairly subjective and may not produce rates that are attractive to investors. *Duquesne* suggests that stranded cost issues will have to be addressed through rate litigation, which means the availability of relief to distressed utilities may be delayed.⁵³ Without legislation, moreover, the remaining

⁵⁰ 488 U.S. 299, 314-15 (1989) [hereinafter *Duquesne*].

⁵¹ 320 U.S. 591, 602-03 (1944) [hereinafter *Hope*].

⁵² *Id.* at 605.

⁵³ The takings issue will recur if demand declines further over time. If demand declines after rates have been set, utilities will once again under-recover their costs, forcing them to file for another round of rate increases to offset the effect of the loss of load since the prior rate case. Utilities will be playing “catch-up” to get the revenues needed to recover their costs and attract investment.

customer base will eventually become too small, forcing utilities to try and convince regulators to permit them to charge exit fees to departing customers. For these reasons, substantial pressure will arise to resolve stranded cost recovery issues through legislation. Legislative fixes will be a hard sell politically, but legislators may be convinced to act in order to prevent important energy policy issues from being decided in the courts.⁵⁴

In determining which facilities remain used and useful, regulators will have to balance reliability and environmental effects as well as economics. They will also have to address complex competing interests. For example, utilities supply power using a combination of owned generation and purchases in the form of FERC-jurisdictional power purchase agreements (PPAs), most of which are the product of regulatory mandates. Federal law protects FERC-jurisdictional PPAs by requiring state regulators to pass through the costs incurred by utility buyers in their retail rates.⁵⁵ But this “trapped cost” protection will be a two-edged sword for utilities that face premature retirement of their own generation while continuing to pay third parties for purchased power. FERC may therefore face a host of contract termination disputes. The transition will be made more difficult by the fact that most utility-owned generation is subject to state regulation, PPAs are regulated by FERC, and substantial generation is publicly owned and not subject to traditional rate regulation.

Generation cost recovery is likely to be under pressure before transmission and distribution. For the most part, the electric delivery system operates as an integrated network, and it will be difficult to identify specific assets that are no longer required as demand declines. Nonetheless, a substantial portion of the cost of electricity consists of investments in transmission and distribution, and a regulator under pressure to reduce rates would eventually have to pay attention to the cost of these facilities. Stranded transmission and distribution cost issues will play out simultaneously at FERC (which regulates most unbundled transmission) and in state proceedings (for bundled transmission and local distribution) unless Congress changes jurisdictional responsibilities.⁵⁶

⁵⁴ Assuming much of the utility industry will have moved into other business lines, including distributed generation, legislators could be less inclined to provide full stranded cost relief in these circumstances.

⁵⁵ See *Nantahala Power & Light Co. v. Thornburg*, 476 U.S. 953, 970 (1986); *Entergy La., Inc. v. La. Pub. Serv. Comm’n*, 539 U.S. 39, 48 (2003).

⁵⁶ In Texas, the Public Utility Commission of Texas (PUCT) regulates all of these functions. In other states where retail rates remain bundled, states will have most of the control over this process for both transmission and distribution assets, unless the FERC chooses (or is forced) to assume jurisdiction over interstate transmission costs that are bundled into retail rates pursuant to the Supreme Court’s opinion in *New York v. FERC*, 535 U.S. 1 (2002).

Disputes will likely arise over which assets should be targeted for early retirement. The interstate transmission grid, for example, is an integrated network of facilities owned by a large number of entities.⁵⁷ One can imagine a form of competition among transmission asset owners to protect their assets and avoid stranded costs. Most publicly-owned transmission is not subject to FERC or state jurisdiction, which will further complicate the process.

As this process unfolds, utility investors will be watching. As cost recovery uncertainty rises, debt and equity investors will demand higher returns, making it more expensive to maintain a reliable grid and putting further upward pressure on utility rates. At some point, the risks could be large enough that investors will not provide capital on acceptable commercial and regulatory terms, and investment in the grid will become problematic, even as many consumers continue to rely on it.

B. Unregulated Generation

In regions where utilities have already divested their generation to merchant power producers, capacity and energy is transacted in wholesale markets under the control of RTOs, subject to overarching FERC regulation. Market forces will therefore play a significant role in determining which generators survive as demand declines. The owners of unregulated generation have assumed the market risk and are much less likely to have valid stranded cost claims.

But electricity markets will only provide a partial solution. With recent reductions in natural gas costs and flat demand, grid-connected generation is already under considerable economic pressure, and regulators are being asked to approve additional revenue streams to support reliability and new investment. In response to disputes over market rules, regulators are making critical decisions on the economic margin. Therefore, even where generation is subject to market forces, the future portends complex regulatory disputes over how wholesale markets should be organized to respond to reductions in the demand for energy from the grid. At the core of these disputes, an enduring tension will exist between economics, reliability, and fairness.

⁵⁷ FERC has recently decided that more entities should be eligible to build and own transmission facilities. *Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities*, Order No. 1000, FERC Stats. & Regs. ¶ 31,323 (2011), *order on reh'g*, Order No. 1000-A, 139 FERC ¶ 61,132, *order on reh'g*, Order No. 1000-B, 141 FERC ¶ 61,044 (2012), *appeal docketed*, *S.C. Pub. Serv. Auth. v. FERC*, No. 12-1232 (D.C. Cir. 2012).

IV. Conclusion

Once a sizable number of customers have invested in distributed generation in response to the subsidies afforded under net metering, changing the economic rules will be difficult, both because some customers will have relied on subsidies to make their investments and others will want the same opportunities as their neighbors. Policymakers therefore should not long defer addressing the consequences of providing these subsidies in order to promote distributed generation over other alternatives. What may appear politically attractive in its early stages can quickly become a regulatory and political quagmire, as the Germans are learning. The U.S. will not countenance electric rates anywhere close to German levels, nor an electric system that is not reliable. Over the long term, any required unwinding of the utility-owned grid due to distributed generation will be extraordinarily complex and will raise many novel and intractable legal and policy issues.