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Transmission and Transport of Energy in the Western U.S. and Canada: A Law and Policy Road Map

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K.K. DUVIVIER, NATE LARSEN, NICK LAWTON, SAM KALEN, STEPHEN R. MILLER, MELISSA POWERS, TARA RIGHETTI, TROY A. RULE, AND AMELIA SCHLUSSER

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I. INTRODUCTION

STEPHEN R. MILLER*

This collection of essays arose from presentations made by participants at the inaugural meeting of the Idaho Symposium on Energy in the West held at the Sun Valley Lodge in Ketchum, Idaho, on November 13th and 14th, 2014. The topic chosen for this first Symposium was Transmission and Transport of Energy in the Western U.S. and Canada: A Law and Policy Road Map. The topic was purposefully large in scope, engaging as many energy sectors and as much of the western U.S. and Canada as possible. The proceedings of this meeting, in turn, will inform future meetings of the Symposium series that will focus on more defined, particularized aspects of western energy production and use.

The Symposium began with two panels that explored energy infrastructural choices that the western U.S. and Canada currently face. Sam Kalen, University of Wyoming College of Law, spoke on law's role in embedding choices in the energy landscape, as well as the nature of a resilient legal architecture necessary to facilitate today's low-carbon preferences. Tara Righetti, also of the University of Wyoming College of Law, then discussed flaring rules related to natural gas exploration in the west. She also discussed how those changes may influence the expansion of natural gas transportation and storage infrastructures in the west. K.K. Duvivier, Sturm College of Law, University of Denver, discussed several problems related to the distribution of wind resources and proposed several solutions. Troy Rule, Sandra Day O'Connor College of Law, Arizona State University, offered thoughts on utilities and the market for rooftop solar generation. Don Howell, chief legal counsel for the Idaho Public Utilities Commission, discussed one state's complications in integrating renewables into its energy portfolio.

The Symposium then turned to a discussion of the potential impacts of the Clean Air Act section 111(d) Clean Power Plan, which was led by Melissa Powers, Lewis and Clark Law School. Issues raised in Prof. Powers' session were continued in the Symposium's afternoon sessions, which were dedicated to western regional energy planning. Three attorneys from the Green Energy Institute at the Lewis and Clark Law School presented on a variety of energy planning issues. Nick Lawton discussed promoting renewable energy development on public lands; Amelia Schlusser discussed the Clean Power Plan's implications for the western grid; and Nate Larsen discussed how utility reforms in Hawaii and New York could ultimately have implications on the Northwest's electricity industry.

The theme of western regional energy planning was continued into the Symposium's last panel. John Fazio, a senior power systems analyst for the Northwest Power and Conservation Council, discussed the Council's current progress on the Seventh Northwest Conservation and Electric Power Plan. David Solan, Boise State University, discussed the creation of energy imbalance markets across the western United States.

All of the Symposium's presentations were live-streamed on the Internet and have been archived on the Symposium website where they may be viewed for free.[1] The essays

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that follow are presented in the order of the authors' presentations at the Symposium, and thus roughly move through the Symposium's major themes of energy infrastructure choices and western regional energy planning. Collectively, these essays provide a notable introduction to leading issues facing western energy law today.

A brief word is due on the nature of the Symposium. The Idaho Symposium on Energy in the West is a new interdisciplinary collaboration between the University of Idaho College of Law Natural Resources and Environmental Law Program; the Center for Advanced Energy Studies at Idaho National Laboratories; and the Energy Policy Institute at Boise State University. The three collaborating institutions plan to hold a meeting of the Symposium series on an annual basis with the hope of providing a new intellectual resource for energy law and policy in the west. In even years, it is anticipated that the Symposium will be a large, public-facing event suitable for scholars, industry professionals, and practicing lawyers. In odd years, the Symposium is anticipated to convene as a smaller, scholarly event with the goal of providing a collaborative environment to advance law and policy scholarship on energy issues. The next Symposium meeting is planned for Spring, 2016.

Finally, many thanks go to my co-organizer of the Symposium series, Barbara Cosens, University of Idaho College of Law, who has proven a valuable mentor in this and other projects over the years.

Contributors' Note: Funding for the *Idaho Symposium on Energy in the West* was generously provided by the Center for Advanced Energy Studies at Idaho National Laboratory (CAES). In particular, thanks go to Dr. Steven Aumeier, Director of Energy Systems and Technologies, Idaho National Laboratory, and Michael Hagood, Director, Program Development, Energy and Environment Science and Technology, Idaho National Laboratory, both of whom gave generously of their time in framing this event, as well as the Symposium series generally. Many at the University of Idaho were essential to the Symposium's success. Foremost among them is Jack McIver, Vice President for Research at the University of Idaho, who assisted in procuring funds for the Symposium and also provided administrative assistance from his office. At the University of Idaho, College of Law, the creation of the Symposium spanned the tenure of three deans—former Dean Donald Burnett, Interim Dean Michael Satz, and current Dean Mark Adams—each of whom supported the Symposium's creation in spirit and also by providing administrative resources from the College. Thanks also go to Dr. David Solan, Assistant Professor, Boise State University Department of Public Policy and Administration and Director of the Energy Policy Institute at Boise State University, for his assistance in framing the discussion. Many thanks go to Eric White and Eric Fredback at the University of Idaho, as well as Donna Wuthrich at CAES, each of whom provided tremendous administrative, accounting, and technical assistance in helping three institutions work together for the first time. Finally, thanks go to the staff at the Sun Valley Lodge—and, in particular, Tayt Knowles and Michael Hoover—who assisted us in hosting a terrific event despite the unexpected blizzard that accompanied this first meeting of the Symposium series.

1. *Idaho Symposium on Energy in the West*, UNIV. OF IDAHO COLL. OF LAW, http://www.uidaho.edu/law/news/upcoming-events/energy-in-the-west (last visited Ocotober 25, 2015).

II. EMBEDDED CHOICES: A RESILIENT ENERGY LEGAL ARCHITECTURE

SAM KALEN**

Fortune Magazine, in 1955, included an array of projections for what our society might look like by 1980: One projection was that homes might be powered by atomic units, with energy virtually free—suggested no less by the then head of the atomic energy commission. A little over ten years ago, our dialogues focused on peak oil and the need for importing liquefied natural gas (LNG); today, policy-makers talk about exports, for oil, coal, and LNG. In just a few short years, crude-by-rail has gone from being barely mentioned to almost a crisis conversation to address too many train accidents.[2] Within roughly a decade and half, as hydraulic fracturing and horizontal drilling has opened up natural gas resources across the country, the natural gas industry has witnessed the rise of the midstream transportation company—without a corresponding structure to ensure the safety of these new lines.[3] Energy, in short, is not just fluid; it is exceedingly dynamic and unpredictable. When, therefore, we engage in a dialogue about "*Transmission and Transport of Energy in the Western U.S. & Canada: A Law and Policy Road Map to 2050*,"[4] the subject of this symposium, we first ought to appreciate how choices in our laws might become embedded and yet inconsistent with the dynamic nature of energy markets and technology.

This short essay, consequently, suggests that our existing legal architecture lacks the resilience necessary to respond effectively to a dynamic energy market and emerging technologies. It briefly reviews how some of those choices have unfolded in the past, how the conversations today recognize that we lack a capable architecture, and then why the dialogues of today focus too much on either specifics or theory rather than constructing a resilient legal architecture for the future.

Our ability to establish workable structures capable of accommodating an ever-changing economy and technology has proven remarkably poor. The Supreme Court and Congress developed legal structures by looking in a rear view mirror, with little appreciation for how quickly or in what manner changes might occur in the road ahead.

** Winston Howard Distinguished Professor, University of Wyoming College of Law. The author would like to thank the participants at the symposium for their helpful questions and comments.

2. *See* High Prairie Pipeline, LLC v. Enbridge Energy Ltd. P'ship, 149 FERC P 61,004, 61,013 (Oct. 1, 2014) (stating that crude-by-rail is an analogue of what some claim is a problem with the administration of crude oil pipelines under the Interstate Commerce Act and the inability of some companies to transport their produce over third party lines); *Spate of Oil Train Accidents May Up Pressure on White House*, GREENWIRE (Feb. 27, 2015) http://www.eenews.net/greenwire/stories/1060014172/search?keyword=spate+of+oil+train+accidents; *see also* Jad Mouawad, *Bakken Crude, Rolling Through Albany*, N.Y. TIMES, (Feb. 27, 2014), http://www.nytimes.com/2014/02/28/business/energy-environment/bakkan-crude-rolling-through-albany.html?_r=0

3. *See* Pipeline Safety: Safety of Gas Transmission Pipelines, 76 Fed. Reg. 53,086, 53,086–88 (Aug. 25, 2011); *see also* U.S. GOV'T. ACCOUNTABILITY OFF., GAO-14-667, OIL AND GAS TRANSPORTATION: DEPARTMENT OF TRANSPORTATION IS TAKING ACTIONS TO ADDRESS RAIL SAFETY, BUT ADDITIONAL ACTIONS ARE NEEDED TO IMPROVE PIPELINE SAFETY (2014) (noting growing risk of federally unregulated gathering pipelines); THE INGAA FOUNDATION, INC., NORTH AMERICAN MIDSTREAM INFRASTRUCTURE THROUGH 2035: CAPITALIZING ON OUR ENERGY ABUNDANCE (2014) (discussing growth of midstream infrastructure).

4. The symposium topic corresponds well with the First of the President's Quadrennial Energy Review, pursuant to the January 9, 2014 Presidential Memorandum, on "Energy Transmission, Storage, and Distribution."

When the Supreme Court first established, during the pre-New Deal era, seemingly easily identifiable spheres of jurisdiction between state and federal authority,[5] neither the assumptions about the nature of electricity nor the market would survive more than another few decades.[6] The 1935 Public Utility Holding Company Act,[7] responding to a perceived failure of the market to arrest market concentration by natural monopolies, ultimately impeded the development of innovative and progressive utilities, a problem well understood by the 1980s but not fully corrected until the Energy Policy Act of 2005.[8] The energy crisis of the 1970s prompted an array of discrete programs, collectively referred to as President Carter's National Energy Policy, but it too was far from a national energy policy and lacked sufficient consistency with emerging environmental principles.[9] Congress, for instance, passed the National Gas Policy Act of 1978,[10] with an assumption that proved inaccurate only to be corrected by the Wellhead Decontrol Act of 1989.[11] Each of these programs and others created embedded choices that cabined innovation and flexibility.

We again are on the cusp of pretending that our legal institutions are prescient enough to craft sufficiently precise rules to carry our energy economy forward for longer than a few years. The undeniable urgency of transitioning to a low carbon economy has produced a fugue of commentary on how to incorporate renewable energy resources into the electric grid,[12] but, as with the debate now between Tesla's electric car and Toyota's push for hydrogen fuel cell cars,[13] it seems foolhardy to believe that our legal institutions have the capacity to canvass existing R&D programs and calculate which ones will succeed. After all, it is almost universally accepted that, if battery storage on a large and reliable scale emerges, our energy markets and structure could be altered significantly.

Yet, the current dialogue about the electric grid appears poised to establish a suite of embedded choices that may, *or may not*, promote a low carbon, low cost, flexible, and reliable grid. To begin with, the jurisdictional paradigm from the Federal Power Act allocating authority between the states and the federal government is marginally

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5. Pub. Utils. Comm'n of R.I. v. Attleboro Steam & Elec. Co., 273 U.S. 83, 90 (1927). In response, Congress passed the 1935 Federal Power Act, amending the 1920 Federal Water Power Act. Public Utility Act of 1935, 49 Stat. 803 (1935).

6. *See generally* STEPHEN BREYER & PAUL MACAVOY, ENERGY REGULATION BY THE FEDERAL POWER COMMISSION (1974) (stating that by the 1950s and 1960s, the need for regional coordination (including power pools) and interconnection—almost dictating a shift toward necessary federal control—emerged).

7. Public Utility Holding Company Act of 1935, 15 U.S.C. § 79–79z (repealed 2005).

8. Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594 (2005).

9. See Sam Kalen, Replacing a National Energy Policy with a National Resource Policy, 19 NAT. RESOURCES & ENV'T 9, 13 (2005).

10. Natural Gas Policy Act of 1978, Pub. L. 95-621, 92 Stat. 3350 (1978) (which sought to correct the resulting effects of the Court's decision in Phillips Petroleum Co. v. Wisconsin, 347 U.S. 672 (1954), extending federal control over producer wellhead sales for resale of natural gas flowing into the interstate market).

11. Natural Gas Wellhead Decontrol Act of 1989, Pub. L. No. 101-60, 103 Stat. 157 (1989).

12. See, e.g., Symposium, Greening the Grid: Building a Legal Framework for Carbon Neutrality, 39 ENVTL. L. 927 (2009); see also Christopher J. Bateman & James T. B. Tripp, Toward Greener FERC Regulation of the Power Industry, 38 HARV. ENVTL. L. REV. 275 (2014); Albert C. Lin, Lessons from the Past for Assessing Energy Technologies for the Future, 61 UCLA L. REV. 1814 (2014).

13. Drew Harwell, *Meet the Fast-Charging, Affordable 'Future' Car That Elon Musk Hates*, WASH. POST., Feb. 25, 2015, https://www.washingtonpost.com/news/the-switch/wp/2015/02/25/meet-the-fast-charging-affordable-future-car-that-elon-musk-hates/.

workable.[14] States, such as those impacted by Hurricane Sandy, want to ensure that they have sufficient say in capacity markets (available electric generation), and are now engaged in a dialogue with the Federal Energy Regulation Commission (FERC) about their ability to intrude into areas FERC considers within its domain.[15] Similarly, issues associated with allocating authority over the administration of the Public Utility Regulatory Policies Act of 1978 are once again surfacing with increasing frequency as smaller renewable energy resources push to come on line.[16] And perhaps, more importantly, it is not yet settled whether FERC or the states can require demand response (efficiency in the grid by downstream consumers).[17] Considerable scholarly commentary, therefore, favors the need for new governance structures that would smooth the jurisdictional divide between the states and the federal government.[18]

But such a dialogue assumes that we know whether a national, regional, or local generation and distribution market is best suited for future technologies. Admittedly, with the advent of regional transmission organizations and independent system operators,[19] along with FERC supervised reliability standards and the importance of balancing authorities for the grid (and push toward organized markets),[20] we may well have established sufficiently embedded choices favoring a regionally structured governance model. That, in turn, for example, could impede the penetration of distributed generation. For instance, in California, proponents of distributed solar generation suggest that the emergence of the large-scale utility solar projects unwisely perpetuates the old energy model of large generation resources situated away from the load.[21]

14. An excellent survey of the issues was presented during the Center for Strategic & International Studies conference on "*Electricity in Transition: Technology, Markets and Regulation*," Sept. 4, 2014.

15. *See* PPL EnergyPlus, LLC v. Nazarian, 753 F.3d 467, 479–80 (4th Cir. 2014) (rejecting Maryland's program for encouraging new capacity in the wholesale market); PPL EnergyPlus, LLC v. Solomon, 766 F.3d 241, 255 (3rd Cir. 2014) (rejecting New Jersey's attempt to encourage new capacity into wholesale market); CPV Shore, L.L.C., 148 FERC P 61,096, 61554 (Aug. 5, 2014) (rejecting agreements as intruding upon FERC authority); Final Initial Brief of Petitioners People of the State of New York and the Pub. Serv. Comm'n of the State of New York, New York v. FERC, No. 13-2316, (2nd Cir. 2014) (distinguishing between jurisdictional local distribution facilities and FERC jurisdictional bulk power transmission facilities).

16. *See* Exelon Wind 1, L.L.C. v. Nelson, 766 F.3d 380, 384–85 (5th Cir. 2014); Allco Fin. Ltd. v. Klee, No. 15-20, 2015 WL 6774324 (2nd Cir. Nov. 6, 2015) (involving question of whether state attempt to promote renewable resources intrudes on FERC's authority); *see also* Midland Power Coop. v. FERC, 774 F.3d 1, 2 (D.C. Cir. 2014) (dismissing for lack of jurisdiction fight over interconnection of a wind developer). The scheduling of small renewable resources has become an issue in the northwest, as well. *See PaTu Wind Farm Takes PGE to FERC Over Transmission Scheduling*, CLEARING UP, No. 1671 (Nov. 7, 2014).

17. *See* Elec. Power Supply Ass'n v. FERC, 753 F.3d 216, 219 (D.C. Cir. 2014), *cert. granted*, 135 S. Ct. 2049 (May 4, 2015). The D.C. Circuit held that FERC's effort to promote demand response intruded upon state authority, a conclusion that the Obama Administration believes "seriously misinterpreted" federal authority. Hannah Northey, *White House Seeks Supreme Court Review of Demand Response Case*, GREENWIRE (Jan. 16, 2015). *See generally* Joel B. Eisen, *An Open Access Distribution Tariff: Removing Barriers to Innovation on the Smart Grid*, 61 UCLA L. REV. 1712 (2014); Joel B. Eisen, *Who Regulates the Smart Grid?: FERC's Authority over Demand Response Compensation in Wholesale Electricity Markets*, 4 SAN. DIEGO J. CLIMATE & ENERGY L. 69 (2012–13).

18. *E.g.*, Alexandra B. Klass & Elizabeth J. Wilson, *Interstate Transmission Challenges for Renewable Energy: A Federalism Mismatch*, 65 VAND. L. REV. 1801 (2012); Hari M. Osofsky & Hannah J. Wiseman, *Hybrid Energy Governance*, 2014 U. ILL. L. REV. 1 (2014).

19. *See* FERC, Regional Transmission Org., 89 FERC P 61,285 (1999). *See also Regional Transmission Org. (RTO)/Independent System Operators (ISO)*, FED. ENERGY REGULATORY COMM'N, http://www.ferc.gov/industries/electric/indus-act/rto.asp (last updated Sept. 29, 2015).

20. *See* Malcolm McLellan & Carol Opatrny, *Maintaining a Balance: Innovation in Power System Balancing Authorities*, 1 WASH. J. OF ENVTL. L. & POL'Y 1 (2011).

21. *E.g.*, W. Watersheds Project v. Salazar, 692 F.3d 921, 923 (9th Cir. 2012); *cf*. Edward Klump, *Even as Grid Persists, EEI Speakers Say Utilities' Approach Must Evolve*, E&E NEWS (Nov. 13, 2014),

What I suggest we need, instead, is not another attempt to construct legal institutions or structures (what I have been calling our legal architecture) based upon present choices, current technologies, or the market as we envision it today, particularly with one of the nation's top energy experts suggesting how the nation's utilities must change dramatically,[22] but rather a fundamental shift in the conversation. The conversation should focus on developing an adaptive, or resilient, legal architecture that enjoys sufficient capacity to permit clean, efficient, and reliable markets and technologies to develop. Just as computer systems gravitated toward an open architecture, we need to explore how to craft our next wave of energy legislation in a manner that will promote, not retard, our shift toward a low carbon energy economy.

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http://www.eenews.net/energywire/2014/11/13/stories/1060008812 (noting speakers' claims that utilities will need to change, but that distributed generation will be a part of the grid). *See generally* AMORY B. LOVINS, REINVENTING FIRE: BOLD BUSINESS SOLUTIONS FOR THE NEW ENERGY ERA 202–09 (2011); Sara C. Bronin, *Curbing Energy Sprawl with Microgrids*, 43 CONN. L. REV. 547 (2010).

22. Peter Behr, *Power Industry on 'Train Wreck' Path, Consultant Says*, E&E NEWS (Sept. 4, 2014), http://www.eenews.net/energywire/2014/09/04/stories/1060005204 (describing comments of Peter Fox-Penner of the Brattle Group).

III. AVOIDABLY LOST[23]: EVOLVING THE REASONABLE USE STANDARD TO REDUCE NATURAL GAS FLARING

TARA RIGHETTI***

In unconventional plays throughout the United States, flaring has become ubiquitous as a means to dispose produced gas that cannot be efficiently gathered and transported to market.[24] The result is waste, lost value, and unnecessary emissions.[25] The distributed nature of unconventional resources, lack of portability of gas, and lower value compared to oil present challenges to infrastructure investment and contribute to the widespread utilization of flaring.[26] These challenges are compounded by the uncertainty and cost associated with obtaining right of way for gathering lines from surface landowners.

Gas production requires a capillary like system through which gas can be gathered, compressed, processed, and delivered to an intrastate or interstate line or point of sale.[27] Development of this type of gathering infrastructure is particularly problematic on split-estates, where property ownership of the surface and minerals is divided.[28] The mineral estate is considered "dominant" and the lessee has an implied right to use as much of the surface as is reasonably necessary to explore for and produce the minerals and give purpose to the grant.[29] There is no prescribed list of what uses are reasonably necessary: reasonableness is determined as a question of fact considering custom, use, and practice in the industry.[30] Over time, this standard has evolved in response to changes in technology and regulation.[31]

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23. The title comes from *Notice to Lessees and Operators of Onshore Federal and Indian Oil and Gas Leases (NTL 4-A)* U.S. DEP'T OF THE INTERIOR GEOLOGICAL SURVEY (Jan. 1, 1980) http://www.blm.gov/style/medialib/blm/ak/aktest/energy/og_forms.Par.32669.File.dat/ntl4a.pdf. I do not suggest that gas flared for lack of infrastructure or right of way should be considered avoidably lost for purposes of determining royalty.

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24. In 2013, forty percent of the natural gas vented or flared in the United States was in North Dakota, much of it from oil wells in the unconventional Bakken formation. *Natural Gas Gross Withdrawals and Production*, U.S. ENERGY INFO. ADMIN. (Sept. 2015), http://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_vgv_mmcf_a.htm; *North Dakota Natural Gas Vented and Flared*, U.S. ENERGY INFO. ADMIN. (Sept. 2015), http://www.eia.gov/dnav/ng/hist/n9040nd2m.htm.

25. Ryan Salmon & Andrew Logan, *Flaring Up: North Dakota Natural Gas More than Doubles in Two Years*, CERES (2013), http://www.ceres.org/resources/reports/flaring-up-north-dakota-natural-gas-flaring-more-than-doubles-in-two-years/view. "In 2012 alone, flaring resulted in the loss of approximately $1 billion in fuel and the GHG emissions equivalent of adding one million cars to the road." *Id.* at 3.

26. Alexandra B. Klass & Danielle Meinhardt, *Transporting Oil and Gas: U.S. Infrastructure Challenges*, 100 IOWA L. REV. 947, 951 (2014).

27. Kevin A. Lawlor & Michael Conder, *Gathering and Processing Design Options for Unconventional Gas*, MIDSTREAM BUS. (Apr. 1, 2013, 12:00 AM), http://www.midstreambusiness.com/gathering-and-processing-design-options-unconventional-gas-222956.

28. Wyo. Outdoor Council v. U.S. Army Corps of Eng'rs, 351 F. Supp. 2d 1232, 1245 (D. Wyo. 2005).

29. 4 NANCY SAINT-PAUL, SUMMERS OIL AND GAS, § 40:4 (3d ed.) (2014); Pulaski Oil Co. v. Conner, 162 P. 464, 464 (Okla. 1916). This right is limited in many states by the accommodation doctrine, which can require the mineral owner to use a less impactful alternative if one reasonably exists.

30. 58 C.J.S. Mines and Minerals §§ 214, 290; Union Producing Co. v. Pittman, 146 So. 2d 553, 555 (Miss. 1962).

31. *See generally* Michelle Andrea Wenzel, *The Model Surface Use and Mineral Development Accommodation Act: Easy Easements for Mining Interests*, 42 AM. U. L. REV. 607; WILLIAM B. STOEBUCK

Dominance, however, has its limits.[32] Where both the surface and minerals are privately owned,[33] courts have restricted the mineral owner's implied easement to include only those uses reasonably necessary to access the minerals directly underlying the surface parcel.[34] Certain field-wide infrastructure, such as wastewater disposal or leadlines carrying off-lease production, has been found to be excessive.[35] Lessees are also prohibited in most situations from using eminent domain to construct gathering infrastructure.[36] Accordingly, lessees must secure a right of way from surface owners to build gathering lines.[37] This process is time-consuming, involves high transaction costs, and encourages strategic opportunism by surface owners, during which time gas is flared, energy is lost, and air pollutants are emitted. [38]

The marketing of production is necessarily incident to the lessee's ability to carry out its rights under the lease.[39] If gas can only be economically marketed through a shared gathering system, the mineral owner's right to surface use should evolve accordingly. Similar to the right of lessees to dispose of off-lease water as part of secondary recovery operations, this interpretation of the reasonable use standard would increase production and reduce the expense of lease operations.[40] This change is essential in that the mineral producer would be considered to have the right to build gathering lines as part of developing its asset, and thus no easement would be required.[41]

Adopting this approach would reduce uncertainty and encourage investment by reducing barriers to private ordering and providing alternative remedies at law. Producers could post bond for surface damages or to obtain an injunction or sue for damages resulting from unreasonable delay. Several producing states have split estate laws that provide the mineral developer with the ability move forward by posting bond when

& DALE A. WHITMAN, THE LAW OF PROPERTY 460 (West Group, 3d ed. 2000) ("[T]he purposes may keep up with those changes that might be reasonably anticipated for the dominant tenement—evolutionary but not revolutionary changes").

32. Kendor P. Jones et al., *Split Estates and Surface Access Issues*, LANDMAN'S LEGAL HANDBOOK 181 (Rocky Mtn. Min. L. Fdn. 2013).

33. Development of pooled, communitized, or unitized minerals may differ. *See* Entek GRB, LLC v. Stull Ranches, LLC, 763 F.3d 1252, 1253 (10th Cir. 2014); Key Operating & Equip. Inc. v. Hegar, 435 S.W.3d 794, 801 (Tex. 2014).

34. Russell v. Tex. Co., 238 F.2d 636, 644 (9th Cir. 1956).

35. Delhi Gas Pipeline Corp. v. Dixon, 737 S.W.2d 96, 98 (Tex. App. 1987) (noting that "the gas purchaser would not have the right to transport any other gas in the line across the surface owner's land without condemnation proceedings or an easement from the owner of the surface estate"); Gill v. McCollum, 311 N.E.2d 741, 743 (Ill. App. Ct. 1974) (holding that disposal of wastewater from off-lease was not permitted because the injection "must have some relation to the primary purpose of obtaining production").

36. Valerie Chambers et al., Eminent Domain in Oil and Gas: Tax Treatment When a Pipeline Devalues Surrounding Property, 23 S. L.J. 225, 232 (2003).

37. Bruce Kramer, *The Legal Framework for Analyzing Multiple Surface Use Issues*, Severed Minerals, Split Estates, Rights of Access, and Surface Use in Mineral Extraction Operations 2-1 (2005), *reprinted in* 44 Rocky Mtn. Min. L. Fdn. J. 273 (2007).

38. *See Industry to Increase Natural Gas Capture to 85 Percent Within Two Years and 90 Percent in Six Years*, N. DAKOTA PETROLEUM COUNCIL (Jan. 29, 2014), http://www.ndoil.org/latest-news/news-release-industry-to-increase-natural-gas-capture-to-85-percent-within-two-years-and-90-percent-in-six-years/.

39. Davis v. Cramer, 837 P.2d 218, 222 (Colo. App. 1992).

40. Crawford v. Hrabe, 44 P.3d 442, 446 (Kan. 2002) (holding that a lessee/operator has the right to bring off-lease salt water on to the leased premises to increase production via injection).

41. Christopher S. Kulander, Surface Damages, Site-Remediation and Well Bonding in Wyoming—Results and Analysis of Recent Regulation, 9 WYO. L. REV. 413, 421 (2009).

negotiations fail.[42] Bonding-on is limited to uses considered within the scope of the implied right of access.[43] As such, gathering facilities do not necessarily qualify for bonding-on or arbitration provisions under those laws. Even in states without split-estate laws, a surface owner can be liable for damages, such as standby rig time, resulting from its obstruction of the mineral owner's reasonable surface use.[44] Were gathering lines considered within the scope of the implied easement, mineral owners could pursue claims for the lost value of flared gas and for any fines, penalties, or royalty assessed on flared gas during the period of delay. While mineral lessees rarely avail themselves of these remedies,[45] the possibility may reduce uncertainty and deter strategic behavior.

Protecting the private property rights of the surface owner against unreasonable use remains critical. Expanding the scope of the easement does not obviate the custom, or requirement under most split-estate acts, to compensate the surface owner for damages.[46] Allowing off-lease production to cross the land justifiably expands the scope of the limited easement granted to the mineral owner,[47] and compensation could be correspondingly increased. The nexus between the use and underlying minerals must also be preserved: where the property is not included in an exploratory unit, any gathering line crossing the property would have to carry some gas produced from parcel. To do otherwise would risk the surface owner being subject to any use that conceivably improved the economics of the entire operations of the producer, without necessarily relating to the dominant parcel itself.

Flaring and venting that results from failures in private ordering to allow construction of gathering lines demonstrates the limitations of the current implied easement for mineral development to address the realities associated with unconventional and dispersed resources. It is necessary to preserve the flexibility of the mineral owner's rights of access to absorb evolutionary changes in response to new resources and new technologies or to provide alternate means of obtaining access through eminent domain. If we fail to do so, we can be certain that energy will continue to be avoidably lost.

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42. *Id*. at 426.

43. WYO. STAT. ANN. § 30-5-402 (2014).

44. *See generally* Ball v. Dillard, 602 S.W.2d 521 (Tex. 1980); Montfort v. Trek Res., Inc., 198 S.W.3d 344 (Tex. Ct. App. 2006).

45. A review of split estate bonds posted in Wyoming since passage of the split estate act indicates that mineral developers bond-on in less than two percent of wells permitted. *See* WYO. OIL AND GAS CONSERVATION COMM'N, wogcc.state.wy.us (last visited Nov. 24, 2015).

46. Andrew M. Miller, Comment, A Journey Through Mineral Estate Dominance, the Accommodation Doctrine, and Beyond: Why Texas is Ready to Take the Next Step with a Surface Damage Act, 40 HOUS. L. REV. 461, 464 (2003).

47. Robinson v. Robbins Petroleum Corp., 501 S.W.2d 865, 867 (Tex. 1973) (holding that deed reservation did not authorize mineral owner to increase the burden on the surface estate for the benefit of additional lands).

IV. WIND–SCATTERED RESOURCES

K.K. DUVIVIER****

Like Olympic contenders vying for the first-place podium, the United States and China have competed for the top spot in wind production since Germany lost that title in 2009.[48] Although China has more installed capacity,[49] the United States became the world's number one producer of wind in 2013.[50] So the good news is that the United States has ample reserves—enough to power the entire current U.S. electricity demand twelve times over.[51] Furthermore, the incentives to develop this climate-friendly source of electricity are strong—not only is it encouraged by state-enacted Renewable Portfolio Standards,[52] but in some instances wind is also the most cost-effective source of electricity generation.[53]

Despite these pluses, one fundamental trait plagues wind development and puts it at a colossal disadvantage against its fossil fuel competitors. The Federal Energy Regulatory Commission (FERC) has charitably called it "location constrained,"[54] but in more blunt terms wind suffers from being a scattered resource. Some of the best U.S. wind reserves occur in a swath through the deep mid-belly of the country, in states like

**** Professor of Law, Sturm College of Law, University of Denver. The author would like to thank Mark Safty for his feedback and her research assistant, Levi Stubbs, for his work on this piece.

48. K.K. DuVivier, The Renewable Energy Reader, U. DENVER LEGAL STUD. RES. PAPER NO. 11–19, (2011). Since 2009, U.S. wind energy capacity grew from approximately 25,000 MW to 61,000 MW. *Wind Generation Records & Turbine Productivity*, AM. WIND ENERGY ASS'N, http://www.awea.org/Issues/Content.aspx?ItemNumber=5806&RDtoken=22166&userID= (last visited Nov. 24, 2015).

49. *Global Installed Wind Power Capacity (MW) – Regional Distribution*, GLOBAL WIND ENERGY COUNCIL, http://www.gwec.net/wp-content/uploads/2012/06/GLOBAL_INSTALLED_WIND_POWER_CAPACITY_MW_%E2%80%93_Regional_Distribution.jpg (last visited Nov. 24, 2015). Ironically, Chinese wind projects also suffer from a lack of transmission to connect scattered resources to load centers. Kat Cheung, *Integration of Renewables: Status and Challenges in China*, INT'L ENERGY AGENCY (2011), http://www.iea.org/publications/freepublications/publication/Integration_of_Renewables.pdf.

50. *Electric Power Monthly*, U.S. ENERGY INFO. ADMIN., (2014), http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_1_1_a. The United States produced 167,840 million megawatt hours in 2013. *Id.*

51. *Electric Power Monthly*, U.S. Energy Info. Admin., (2014), http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_es1b; Anthony Lopez et al., Nat'l Renewable Energy Lab., U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis, iv (2012), http://www.nrel.gov/docs/fy12osti/51946.pdf.

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

53. "Wind prices are extremely competitive right now, offering lower costs than other possible resources, like natural gas plants. These projects offer a great hedge against rising and often volatile fuel prices." David Sparby, president & CEO of Xcel Energy's Northern States Power announcing 600MW of new wind power contracts on July 16, 2013. *The Cost of Wind Energy in the U.S.*, AM. WIND ENERGY ASS'N, http://www.awea.org/Resources/Content.aspx?ItemNumber=5547#ComparativeCost (last visited Nov. 24, 2015).

54. Cal. Indep. Sys. Operator Corp., 119 F.E.R.C. P 61,061 (2007); *see also* Heidi Werntz, *Let's Make a Deal: Negotiated Rates for Merchant Transmission*, 28 PACE ENVTL. L. REV. 421 n.10 (2011).

North Dakota, South Dakota, Nebraska, Montana, Kansas, and Iowa.[55] Ironically, these are also some of the states with the lowest populations and electricity demands.[56]

Unlike other sources of energy that might be shipped by rail or barge, wind power can only be transported by transmission line. So what makes matters worse for scattered wind resources is that these wind-rich states are located in the no-man's-land of the unconnected divide between the three major U.S. transmission interconnections.[57] While first-generation wind farms could be built near existing transmission, further development of an energy superhighway is crucial to connect U.S. wind power reserves to load centers.[58]

The federal government has attempted to address the scattered resources problem with both funding and policy measures. The American Recovery and Reinvestment Act of 2009 directed $3.4 billion dollars to modernizing the U.S. transmission grid.[59] In addition, FERC orders, primarily addressing siting authority and cost allocation, sought to encourage regional and interregional cooperation by breaking down barriers perpetuating parochial approaches to transmission development.

But the FERC solutions have been frustrating. First, courts have not upheld FERC's transmission siting authority.[60] Second, Order 1000, which allows FERC to guide allocation formulas to help determine rates on a regional instead of a localized basis, has now been recognized by a federal court.[61] However, that authority was vehemently resisted by sixty-one vested entities, "includ[ing] state regulatory agencies, electric transmission providers, regional transmission organizations, and electric industry trade associations"[62] that are "weighing their options" after the most recent ruling and "are

55. *United States—Wind Resource Map*, U.S. DEP'T OF ENERGY NAT'L RENEWABLE ENERGY LAB., (May 6, 2009), http://www.nrel.gov/gis/images/US-50m-wind-power-map.jpg. The rankings for best wind resources is as follows: 1) North Dakota; 2) Texas; 3) Kansas; 4) South Dakota; 5) Montana; 6) Nebraska; 7) Wyoming; 8) Oklahoma; 9) Minnesota; and 10) Iowa. Megan Phelps, *The Best States for Wind Power*, MOTHER EARTH NEWS (Sept. 2, 2009), http://www.motherearthnews.com/renewable-energy/wind-resources-united-states.aspx.

56. *Electricity Consumption by State*, UNIV. OF KAN., (2013), http://www.ipsr.ku.edu/ksdata/ksah/energy/18ener7.pdf. Excluding Texas from the states with the best resources, because of its size and its being its own interconnection, the top nine states account for 39.9% of the total installed wind power, and only consume about 9% of the electricity in the United States annually. *Id.*; *Installed Wind Capacity*, U.S. DEP'T OF ENERGY (July 27, 2015), http://apps2.eere.energy.gov/wind/windexchange/wind_installed_capacity.asp.

57. Because of differing frequencies and lack of connections, there is virtually no electricity transfer between the Eastern Interconnection, the Western Interconnection, and Ercot, which serves only Texas. Klass & Wilson, *supra* note 18, at 1808. "Within each subregion, the electric network is highly interconnected and interdependent, but there is no capacity to move electricity between these three subregions." *Id.*

58. Am. Wind Energy Ass'n & Solar Energy Indus. Ass'n, Green Power Superhighways: Building a Path to America's Clean Energy Future 3 (2009), https://www.awea.org/files/FileDownloads/pdfs/GreenPowerSuperhighways.pdf.

59. Werntz, *supra* note 54, at 422.

60. Piedmont Envtl. Council v. FERC, 558 F.3d 304, 309–10 (4th Cir. 2009); *see also* David A. King, *Interregional Coordination of Electric Transmission and Its Impact on Texas Wind*, 8 TEX. J. OIL, GAS, & ENERGY L. 309, 327 (2012–13) (citing Cal. Wilderness Coal v. DOE, 631 F.3d 1072 (9th Cir. 2011)); Uma Outka, *The Renewable Energy Footprint*, 30 STAN. ENVTL. L.J. 241, 261 (2011); Joshua P. Fershee, *Moving Power Forward: Creating a Forward-Looking Energy Policy Based on a National RPS*, 42 CONN. L. REV. 1405, 1417–19 (2010).

61. S.C. Pub. Serv. Auth. v. FERC, No. 12-1232, 2014 U.S. App. LEXIS 19968 (D.C. Cir. Oct. 17, 2014) (denying the petition for rehearing *en banc*) (effectively upholding F.E.R.C.'s power under Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities); Order No. 1000, 76 Fed. Reg. 49,842 (Aug. 11, 2011) (codified at 18 C.F.R. pt. 35) [hereinafter Order 1000].

62. S.C. Pub. Serv. Auth. v. FERC, 762 F.3d 41, 48 (D.C. Cir. 2014).

likely in the future" to mount "[s]ignificant [additional] challenges to the scope of FERC's granted power under [Order 1000]…."[63]

Perhaps most significantly, the challenges to FERC's authority have created delays in the development of Regional Transmission Organization [RTO] lines.[64] By some estimates, the average timeline for a transmission project is seven years.[65] The FERC 1000 court challenges added four years to the front end of that process, and future challenges to FERC authority may push starts back even further.

In addition, FERC 1000 does not mandate interconnection-wide transmission planning,[66] but instead relies on voluntary agreement from beneficiaries.[67] As a scattered resource, wind creates generation and consumption markets across state lines with especially contentious negotiations because the costs and "benefits of the proposed project may accrue unevenly to market participants.'"[68] Thus, cost allocation remains one of the biggest challenges facing interstate transmission development.[69] Even with increased FERC authority, the lengthy cost-allocation negotiations at the front end of the development process may push back the time to start the regulatory and permitting phases, delaying new transmission capacity for more than a decade.

In this environment, the alternative of private merchant lines has become increasingly attractive.[70] In contrast to the incremental steps that FERC has been able to achieve, the merchant-line process allows a jump start to transmission construction. One advantage for merchant developers is that they build transmission independently from incumbent utilities. Thus, the private merchant alternative does not require transforming and reworking traditional power structures.[71]

Merchant lines are also able to circumvent the lengthy and difficult cost-allocation process. Private parties put up the capital for merchant line construction and recoup their investment through services charges. Because they do not serve "captive retail customers" as utilities do, these merchant developers have "the right to charge for transmission service at negotiated rates, unencumbered by the traditional cost of service ratemaking principles and filings usually applied to transmission service." [72]

As a result, several merchant transmission lines appear to be closer to fruition than RTO lines. A few examples include the SunZia Southwest project, scheduled to begin in

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63. Recent Developments in Texas, United States, and International Energy Law, 10 TEX. J. OIL, GAS, & ENERGY L. 213, 253 (2014).

64. Klass & Wilson, *supra* note 18, at 1870–72.

65. RENEWABLE ENERGY TRANSMISSION ROADMAP, W. GOVERNOR'S ASS'N 6 (2010), http://www.westgov.org/images/dmdocuments/TransmissionRoadMap2010.pdf.

66. Order 1000, *supra* note 61, at 49,942 ("The Commission is not requiring either interconnectionwide planning or interconnectionwide cost allocation.").

67. Order 1000, *supra* note 61, at 49,860.

68. Klass & Wilson, *supra* note 18, at 1870 (quoting Sari Fink et al., National Renewable Energy Laboratory, A Survey of Transmission Cost Allocation Methodologies for Regional Transmission Organizations 2 (2011), http://www.nrel.gov/docs/fy11osti/49880.pdf).

69. Klass & Wilson, *supra* note 18, at 1870.

70. *See, e.g.*, Alexandra B. Klass, *Takings and Transmission*, 91 N.C. L. REV. 1079, 1120–31 (2013) (comparing the "private independent [merchant] transmission lines" and traditional public utility lines in the context of eminent domain).

71. *See* Werntz, *supra* note 54, at 424–26.

72. Werntz, *supra* note 54, at 425.

2015;[73] the Zephyr Transmission project, scheduled to begin construction in 2017;[74] and the TransWest Express Transmission project, due to begin construction in 2015.[75] In addition, some of these markets seem competitive as alternative private proposals have been made for some of the same routes.[76]

In conclusion, wind power's scattered nature will continue to challenge its development until transmission construction conundrums can be resolved. Expanding FERC's authority may provide many long-term benefits for RTO lines, but continued delays threaten effective development.[77] Merchant lines may have their problems,[78] but currently these private sector solutions appear to be the more efficient solution for funding transmission lines to scattered wind resources.

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73. The SunZia Southwest Transmission Project is the first of the Rapid Response Team for Transmission (RRTT) projects to receive Department of Interior approval for its Right of Way. ETRANS FEDERAL PERMITTING TRANSMISSION TRACKING SYSTEM, http://trackingsystem.nisc-llc.com/etrans/utility/Search.seam. After receiving the green light from the federal government, SunZia projected an early 2016 start date for construction. Zachary Ziegler, *Power Line Project Gets Final Federal Permit*, ARIZ. PUB. MEDIA (Jan. 27, 2015), https://news.azpm.org/p/news-spots/2015/1/27/55220-power-line-project-gets-final-federal-permit/. However, the project must still receive approval from the New Mexico and Arizona state land boards and hit a snag in New Mexico where one official put the process temporarily on hold for further review. Staci Matlock, *Land Commissioner Delays SunZia Transmission Line for Further Review*, SANTA FE NEW MEXICAN (Jan. 29, 2015), http://www.santafenewmexican.com/news/local_news/land-commissioner-delays-sunzia-transmission-line-for-further-review/article_acb099d0-7512-53b2-9b1c-f65222d28680.html.

74. *Zephyr Power Transmission Project*, DUKE AM. TRANSMISSION CO., http://www.datcllc.com/projects/zephyr/ (last visited Nov. 7, 2015). Not one of the seven pilot projects undertaken by the Rapid Response Team for Transmission, but on a similar schedule as the large pilot merchant projects. *Id.*; *Coordination of Federal Transmission Permitting on Federal Lands (216(H))*, ENERGY.GOV, http://www.energy.gov/oe/services/electricity-policy-coordination-and-implementation/transmission-planning/coordination (last visited Nov. 7, 2015).

75. *Delivering Wyoming Wind Energy to the West*, TRANSWEST EXPRESS, LLC, http://www.transwestexpress.net/index.shtml (last visited Nov. 7, 2015).

76. Nathanael Massey, *Renewable Energy: Private Transmission Ventures Aim to Send Wyo.'s Wind Power South*, E&E PUBLISHING, LLC (Feb. 1, 2013), http://www.eenews.net/stories/1059975650 (noting that multiple lines are being proposed and constructed to carry Wyoming wind to the southwestern states).

77. In addition, FERC 1000 has limited application, "only appl[ying] to jurisdictional public utilities, which include only the investor-owned utilities, and the RTOs which manage them under the Federal Power Act. This would include only approximately less than 200 entities among the approximately 3,000 utilities in the U.S." Steven Ferrey, *Pentagon Preemption: The 5-Sided Loss of State Energy and Power*, 2014 U. ILL. J. L. TECH. & POL'Y 393, 420 (2014).

78. *E.g.*, *Recent Rulings from FERC*, 4080 PUR Util. Reg. News 4 (July 27, 2012) (describing FERC decisions in favor of incumbent utilities as opposed to "**merchant transmission** developers regarding ownership and the right to build newly planned lines or related grid-related facilities"); Kevin B. Jones, David Clarke & James Parmelee, *The LMP Model: Bottlenecking Merchant Transmission*, 141 No. 8 Pub. Util. Fort. 35 (Apr. 15, 2003) (describing pricing and contract issues that are necessary to incentivize market-based solutions).

V. UNNATURAL MONOPOLIES: WHY UTILITIES DON'T BELONG IN ROOFTOP SOLAR MARKETS

TROY A. RULE*****

Distributed solar energy development has increased exponentially in the United States over the past decade. Much of this development has come in the form of photovoltaic ("PV") solar panel installations on the rooftops of homes and small businesses. A combination of government incentive programs and falling PV prices has made these rooftop solar energy systems an increasingly attractive investment for electric utility customers throughout the country.[79]

Although most rooftop solar energy companies surely welcome this coming-of-age of their industry, many electric utilities understandably take a less favorable view of it. Utility customers with rooftop solar panels tend to purchase far less electricity from their utilities than customers who have no solar panels. Consequently, the recent growth of distributed solar energy is beginning to adversely impact utilities' revenues. Unfortunately for utilities, a strategy of increasing electricity rates to offset revenue growth reductions resulting from the emergence of rooftop solar technologies might well exacerbate rather than mitigate the problem. Such rate increases serve only to make rooftop solar power more cost-competitive with grid-supplied electricity and thereby prompt even more customers to go solar.

With few other places to turn for additional revenue, utilities could eventually find themselves in what some have labeled a "death spiral": a pattern in which electricity rates climb ever higher, prompting ever more customers to install their own distributed solar energy systems.[80] In the worst-case version of this pattern, the spiral of rising electricity rates and increasing rooftop solar panel installations accelerates until the utility ultimately sinks into insolvency.

Many utilities throughout the country are understandably seeking for ways to address the growing threats that distributed solar energy technologies pose to their long-term survival. Over the past few years, numerous utilities in the United States have advocated for policy reforms that, if implemented, would unquestionably slow the pace of rooftop solar energy installations in their territories. These reform proposals have taken

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79. For information about the recent growth of rooftop solar energy, *see generally* SOLAR MARKET INSIGHT REPORT 2014 Q1, SOLAR ENERGY INDUS. ASS'N, (2014), http://www.seia.org/research-resources/solar-market-insight-report-2014-q1 (noting that the United States "installed 1,330 MWdc of solar PV in Q1 2014, up 79% over Q1 2013, making it the second-largest quarter for solar installations in the history of the market").

80. *See, 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?_r=0 (stating that, "[a]s utilities put a heavier burden on fewer customers, it increases the appeal for them to turn their roofs over to solar panels" and that "[u]tility executives call this a 'death spiral'"); Liam Denning, *Lights Flicker for Utilities*, WALL STREET J. (Dec. 22, 2013), http://www.wsj.com/articles/SB10001424052702304773104579270362739732266 (noting some investors' concerns about a "looming 'death spiral' for utilities, "with solar power as the culprit").

a wide variety of forms, from increasing the fixed portion of customers' utility bills to imposing special fees on solar energy users to reducing customers' benefits under net metering programs. A few utilities have found some limited success in pursuing these types of reforms. However, most utilities are still searching for new ways to shore up their long-term stability against a rising tide of distributed solar technologies.

Interestingly, a small number of utilities have recently begun experimenting with an entirely new, "if you can't beat 'em, join 'em" sort of response to the rapid rise of distributed solar. This type of strategy is manifest in a handful of newly-proposed projects that would essentially allow utilities to directly compete as producers in private rooftop solar markets. Perhaps most notable among these projects is the one announced in 2014 by the investor-owned utility Arizona Public Service Co. ("APS"), which services more than one million customers in Arizona. Under its plan, APS will lease rooftop space from 1,500 residential households in exchange for a $30 per month credit on those households' electricity bills.[81] APS will then contract with private companies to install solar PV systems on all 1,500 rooftops. APS will own all of the solar panels involved in the project and the electricity the panels generate, which will flow directly onto the grid. Importantly, the $30 bill credit APS is offering to customers under its plan exceeds the average monthly net utility bill savings APS customers can presently get by purchasing or leasing rooftop solar panels in the private market and thereby buying less power from the utility.[82] In other words, the APS plan will undercut pricing in the competitive private rooftop solar energy market within its territory, giving customers little economic reason to go solar through any entity other than APS.

Shortly after APS released its proposed rooftop solar plan, Tucson Electric Power ("TEP")—a different investor-owned utility that also operates in Arizona—proposed a very similar sort of project. Under TEP's proposed plan, residential customers would lease their rooftop space to the utility in exchange for the right to lock in a fixed price for grid-delivered electric power for 25 years.[83] Like APS, TEP anticipates hiring local contractors to install solar PV systems on the rooftops of the homes of customers who enroll but TEP would own the systems and all of the power they generate. Comparable utility proposals have recently been floated in other states as well.

What are the potential long-term consequences of allowing utilities to compete directly within the rooftop solar energy market through these types of programs? And what sorts of considerations should inform policy decisions relating to this trend? Policies

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81. The APS proposal initially involved 3,000 rooftops but was later reduced to 1,500. *See generally* Ryan Randazzo, *APS Wants to Put Free Solar Panels on 3,000 Homes*, AZ CENTRAL (July 28, 2014), http://www.azcentral.com/story/money/business/2014/07/28/aps-wants-put-free-solar-panels-homes/13299121/ [hereinafter Randazzo, *APS Proposal*] (describing the APS proposal); Ryan Randazzo, *APS Will Move Ahead with Free Solar*, AZ CENTRAL (Dec. 19, 2014), http://www.azcentral.com/story/money/business/2014/12/19/aps-will-move-ahead-free-solar/20670299/ (noting that the project received state utility commission approval but for only 1,500 homes rather than 3,000 homes). Additional information about the APS rooftop solar proposal is also posted on the utility's web page at http://www.aps.com/en/ourcompany/aboutus/investmentinrenewableenergy/Pages/azsun.aspx?src=azsun.

82. *See* Randazzo, *APS Proposal*, *supra* note 81 (noting that, when APS utility customers lease panels from the private rootop solar company SolarCity, "their new, lower power bills combined with the lease payments bring about $5 to $10 a month in savings for customers").

83. *See* Robert Walton, *Tucson Electric Power Proposes New Utility-Owned Rooftop Solar Program*, UTILITYDIVE (Aug. 20, 2014), http://www.utilitydive.com/news/tucson-electric-power-proposes-new-utility-owned-rooftop-solar-program/299840/ (describing Tucson Electric Power's proposal and quoting one solar energy industry advocate as accusing the utility of "trying to go into a completely new market and compete on an unlevel playing field in a market that's already served by competitive forces").

allowing electric utilities to enter into established, competitive markets are unprecedented and raise significant policy concerns. The impropriety of welcoming utilities into the rooftop solar energy market is most easily illuminated through the basic microeconomics framework that has long served as the primary theoretical basis for utility regulation itself.

A. Natural Monopoly Theory

The basic characteristics of electricity distribution make it inherently prone to a condition that economists describe as the "natural monopoly" problem.[84] A natural monopoly is a firm that can produce all of the output demanded in its relevant market for a lower aggregate cost than is achievable by a group of smaller, competitive firms. This capability clearly exists for utilities in retail electricity distribution markets. The large up-front expenditures associated with building out an extensive infrastructure system capable of distributing electric power to customers throughout a region make it very difficult for firms to enter such markets and effectively compete with incumbent utilities. In the absence of government intervention, such utilities would thus be largely free to act like monopolies, charging excessively high prices and raking in large profits without serious risk of a loss of market share.

In recognition of this market failure, a heavy regulatory structure has long sought to prevent inefficient behavior by natural monopolies within the electricity distribution industry. Such regulations generally prohibit utilities from charging excessive prices and ensure that utilities provide service to all qualified customers within their service areas. In exchange for these obligations, state regulators protect utilities from certain types of competition and allow them to earn a reasonable return on their infrastructure investments. Although it is far from perfect, this regulatory approach has been fairly effective at promoting reliable, low-cost electric power distribution for a very long time.

B. Rooftop Solar Markets are Not Prone to Natural Monopoly Problems

Unfortunately, the current utility regulatory system is poorly suited for use in competitive markets such as the market for rooftop solar energy installations. Unlike markets for grid-supplied electricity, the market for rooftop solar energy installations is not prone to the natural monopoly problem. Entering the rooftop solar market as a producer does not require exceptionally large up-front investments. Low barriers to entry allow multiple retail solar panel sellers and installers to efficiently compete on price, quality and service. Likewise, it is not a waste of resources for multiple smaller, competing rooftop solar businesses to co-exist in the same geographic area. Accordingly, healthy market competition already exists in the rooftop solar industry, helping to promote continued innovation, quality products, and reasonable profit margins. Like the existing markets for rooftop shingles or rooftop gutters, the market for rooftop solar PV can function very efficiently without the sort of heavy government intervention that electricity distribution markets require.

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84. For a primer on natural monopolies and the predominant approach to regulating them, *see generally* FRED BOSSELMAN ET AL., ENERGY, ECONOMICS AND THE ENVIRONMENT 53–65 (Foundation Press 3d ed. 2010).

These fundamental differences between electricity distribution markets and the rooftop solar markets greatly affect how policymakers should approach project proposals like those of APS and TEP described above.[85] Since rooftop solar markets are not prone to natural monopoly problems, utilities operating within regulatory regimes designed to address natural monopoly problems have no place in these markets. Allowing elements of a heavy regulatory structure designed to govern natural monopolies to creep into such private competitive markets is akin to administering a powerful prescription drug to a patient who is not sick: no real benefits are likely to result, yet it has the potential to cause costly and harmful side effects.

To permit regulated utilities to compete as producers in rooftop solar markets through projects like those proposed by APS and TEP would essentially stack the deck in such utilities' favor. Regulated utilities often have access to lower-cost capital, large customer bases, and market risk protections that simply are not available to non-utility rooftop solar installation firms. Lacking equivalent advantages, many companies are likely to pull out of rooftop solar markets where utilities are permitted to directly compete. As they do, an industry that once thrived under healthy competition will gradually degenerate into one unnecessarily burdened with inefficiencies and stifled innovation.

C. Avoiding an "Unnatural Monopoly" Problem in the Rooftop Solar Industry

The present struggle between electric utilities and the rooftop solar energy industry is not the first time that a regulated utility has sought to protect its monopoly against disruptive innovation. Some have used the term "unnatural monopoly" to describe such instances when a regulated utility is permitted to enter an industry that is not prone to natural monopoly problems.[86] Policies that perpetuate such unnatural monopoly problems tend to be highly inefficient and are rarely cost-justified.[87]

For example, an analogous sort of unnatural monopoly problem existed toward the end of AT&T's control of telecommunication markets in the 1980s and 90s. Understandably, AT&T would have liked to respond to technological advancements that were transforming the landline telephone industry through new ventures enabled the company to compete directly in the emerging markets that threatened its monopoly position.[88] However, Congress and regulators eventually erected various barriers between AT&T and those emerging technology markets to help prevent AT&T from abusing its incumbent utility status to gain an anticompetitive advantage in those new industries.[89]

A similar sort of policy response is needed today in the context of rooftop solar energy. Policymakers would never permit a regulated electric utility to begin selling

85. *See generally supra* text accompanying nn. 84–86.

86. *See generally* Adam D. Thierer, *Unnatural Monopoly: Critical Moments in the Development of the Bell System Monopoly*, 14 CATO J. 267 (1994), http://object.cato.org/sites/cato.org/files/serials/files/cato-journal/1994/11/cj14n2-6.pdf.

87. *See id.* at 267 (noting that utility regulation in the telecommunications industry in the 1990s was "impeding the growth of new technologies, jobs, and exports, while simultaneously denying consumers the benefits of competition.").

88. *See* Jordan Jay Hillman, *Telecommunications Deregulation*: *The Martyrdom of the Regulated Monopolist*, 79 NW. U. L. REV. 1183, 1224 (1984) (stating that "AT&T would undoubtedly have preferred to enter" emerging, unregulated markets for computer-based data processing "free from any structural constraints").

89. *See id.* at 1224–29 (describing numerous constraints on AT&T's ability to compete directly in emerging technology markets that threatened its monopoly on telecommunication services).

rooftop shingles or rooftop gutters in the private marketplace. For similar reasons, entities that enjoy the advantages of being regulated electric utilities should not be permitted to compete directly in the market for rooftop solar installations. Electric utilities and their subsidiaries should be required to forfeit all regulatory protections and become fully privatized before competing as producers in these markets. This principle should apply even to subtle forms of market entry like those exemplified by the recent APS and TEP project proposals. Policies that consciously guard against unnatural monopoly problems through these and other means will promote greater economic efficiency as innovation continues to transform electricity markets in the coming years.

VI. THE RISKS OF OPTING OUT OF THE CLEAN POWER PLAN FOR WESTERN STATES

MELISSA POWERS******

A. Introduction

In June 2014, the Environmental Protection Agency (EPA) published its proposed Clean Power Plan, a Clean Air Act regulation that would require existing fossil fuel-fired power plants to reduce their carbon dioxide emissions.[90] Opposition to the proposal was swift. Companies in the coal industry and several states preemptively challenged the Clean Power Plan in court, arguing that EPA lacks statutory authority to regulate the emissions from existing power plants.[91] Opponents to the Clean Power Plan also argued in court, before Congress, and in the press that the plan was unconstitutional.[92] Many states and regulated parties likewise asserted that the plan would be unworkable and unduly expensive. Finally, in March 2014, in an asserted attempt to fight back against the Obama Administration's purported "war on coal," Senator Mitch McConnell began to urge states to "just say no" to the Clean Power Plan by refusing to adopt state strategies to implement the plan's emissions limits.[93]

The "just say no" campaign immediately attracted significant media attention and opposition from EPA and the Clean Power Plan's supporters.[94] These responses undoubtedly fulfilled some of Senator McConnell's goals to drive further wedges between advocates and opponents of the Clean Power Plan. However, setting politics aside, it would be shortsighted and counter-productive for western states to heed Senator McConnell's advice. As this essay will explain, western states that pursue an "opt-out" strategy will surrender significant decision-making authority to the EPA as a result of the cooperative-federalism structure of the Clean Air Act. Although these states could ultimately regain the power to administer the Clean Power Plan, they would nonetheless lose the ability to establish a guiding structure for the Clean Power Plan's implementation in the West. By the time states step in to take over the Clean Power Plan from EPA, it could be too late for them to reverse the course set by other states interested in creating a regional framework for implementing the Plan. Thus, rather than opt out, this essay

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90. Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 79 FED. REG. 34,830 (June 18, 2014) (to be codified at 40 C.F.R. pt. 60) [hereinafter *Clean Power Plan*].

91. *See* West Virginia v. U.S. Envtl. Prot. Agency (*In re* Murray Energy Corp.), 788 F.3d 330, 333 (D.C. Cir. 2015).

92. *See* Coral Davenport, *McConnell Urges States to Help Thwart Obama's "War on Coal"*, N.Y. TIMES, Mar. 19, 2015, http://www.nytimes.com/2015/03/20/us/politics/mitch-mcconnell-urges-states-to-help-thwart-obamas-war-on-coal.html?_r=0.

93. Mitch McConnell, Op-Ed, *States Should Reject Obama Mandate for Clean-Power Regulations*, LEXINGTON HERALD-LEADER, Mar. 3, 2015, http://www.kentucky.com/2015/03/03/3725288_states-should-reject-obama-mandate.html?rh=1.

94. Davenport, *supra* note 92; Greg Sargent, *Mitch McConnell Has a Plan to Derail Obama's Climate Agenda. It Might Actually Work.*, WASH. POST, Mar. 23, 2015, http://www.washingtonpost.com/blogs/plum-line/wp/2015/03/23/mitch-mcconnell-has-a-plan-to-derail-obamas-climate-agenda-it-might-actually-work/; *Mitch McConnell: An Example of When "Just Say No" Goes Wrong*, SIERRA CLUB COMPASS, Mar. 16, 2015, http://www.sierraclub.org/compass/2015/03/mitch-mcconnell-example-when-just-say-no-goes-wrong.

argues that western states—even those opposed to the Plan—should start planning their implementation strategies.

Part B of the essay briefly introduces the Clean Power Plan and the structure the Clean Air Act establishes for implementing existing source emissions standards. Part C discusses the underlying objective of Senator McConnell's opt-out advice and how that would affect states that pursued an opt-out strategy. Part D then argues that western states should eschew the opt-out approach, even if they otherwise object to the Clean Power Plan.

B. The Clean Power Plan in a Nutshell

The Clean Power Plan is a proposed regulation under Clean Air Act section 111(d) that would require existing fossil fuel-fired power plants to reduce their emissions of carbon dioxide. Section 111(d) generally gives states the primary responsibility for regulating existing source emissions, subject to EPA-established requirements.[95] Section 111(d) regulates a narrow set of pollutants, [96] however, and it has been rarely used to date. EPA's proposal for applying section 111(d) to carbon dioxide emissions from power plants is undoubtedly ambitious.

Pollutants regulated under section 111(d) are subject to "standards of performance."[97] A standard of performance is

> a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.[98]

Traditionally, EPA has treated standards of performance as technology-based emissions limitations achievable by the affected sources.

With the proposed Clean Power Plan, however, EPA focused on the phrase "best system of emission reduction" to propose emissions limitations based on what the electricity system could achieve as a whole.[99] Under this system-wide approach, EPA proposed emissions limitations that could be achieved through the use of four building blocks: 1) efficiency gains at each affected power plant, 2) reduced use of high-emitting affected power plants in favor of increase use of lower-emitting affected power plants, 3) reduced generation at all affected power plants in favor of low- and zero-carbon sources (i.e., renewable and nuclear power plants), and 4) reduced generation at all affected power plants through energy efficiency.[100] In other words, rather than consider how technology applied only to regulated facilities might lower emissions, EPA considered how improvements to each state's electricity system might enable reduced emissions at each

95. 42 U.S.C. § 7411(d)(1) (2012).
96. *Id.* The scope of this regulatory power is at issue in the *Murray Energy* lawsuit, *supra* note
97. 42 U.S.C. § 7411(d)(1) (2012).
98. *Id.*; 42 U.S.C. § 7411(a)(1) (2012).
99. *Clean Power Plan*, *supra* note 90, at 34,834–35.
100. *Id.* at 34,836.

affected source. EPA then created state-specific emissions rates (what EPA calls state-specific goals) that states would implement.[101]

States have the primary responsibility for implementing section 111(d). Specifically, section 111(d) directs EPA to "establish a procedure" under which states shall submit to the EPA a plan establishing standards of performance for regulated existing source emissions and requirements for the implementation and enforcement of the standards of performance.[102] If a state fails to submit a satisfactory plan, EPA may promulgate a federal plan instead.[103]

In the draft Clean Power Plan, EPA likewise proposed that states would play the primary role in implementing the standards of performance for the affected power plants. Under EPA's proposed rules, states could therefore decide whether to apply the state-specific goals to the affected sources or whether to develop an alternative compliance strategy.[104]For example, states might adopt a cap-and-trade program to reduce statewide carbon dioxide emissions.[105] Or states might aim to displace carbon dioxide emissions by increasing renewable power generation.[106] Ultimately, under the proposed Clean Power Plan, states would have broad discretion so long as they adopt their own plan. If, however, a state opts out of the planning process, EPA would decide how to implement the state-specific goals.

C. The "Just Say No" Strategy

EPA's draft rule prompted an early—and likely premature—rush to the courthouse, first by fossil fuel producers and then by several Republican states. Their suits raise a host of legal and constitutional arguments. The constitutional arguments have earned quite a bit of media attention, largely because Laurence Tribe—who is generally considered a liberal constitutional scholar—has made them.[107] Seemingly emboldened by these legal arguments[108] (but also perhaps fearful that the D.C. Circuit would dismiss the suits as unripe), Senator McConnell jumped into the fray with his "just say no" campaign. In an op-ed[109] and a letter sent to the National Governors Association,[110] Senator McConnell urged state political leaders to refuse to adopt their own SIPs to implement the Clean Power Plan.

Senator McConnell appears to be motivated by a number of factors. First, he expressly stated that he hopes the opt-out strategy would serve as a stalling tactic, enabling the Clean Power Plan to languish while future legal challenges and repeal efforts ensue.[111] Underlying this hope must be his fear that the Plan will gather momentum and support as states work to implement it while legal challenges proceed. Second, Senator

101. *Id.* at 34,895.
102. 42 U.S.C. § 7411(d)(1).
103. 42 U.S.C. § 7411(d)(2).
104. *Clean Power Plan*, *supra* note 90, at 34,833, 34,837–39.
105. *Id.* at 34,837–39.
106. *Id.* at 34,838–39. Alternative strategies, like one based on renewable power generation, would still have to meet the required emissions reductions.
107. Davenport, *supra* note 92.
108. *Id.*
109. McConnell, *supra* note 93.
110. Letter from Sen. Mitch McConnell to Nat'l Governors Ass'n (Mar. 19, 2015), http://d35brb9zkkbdsd.cloudfront.net/wp-content/uploads/2015/03/McConnelltoGovernors.pdf [hereinafter *McConnell letter*].
111. *Id.* at 3.

McConnell may be trying to upset the international negotiations to create the next climate change treaty.[112] If enough states opt out of the Clean Power Plan, this may send a message to the rest of the world that the United States is not serious about reducing its own greenhouse gas emissions. Third, the opt-out strategy could help perpetuate the partisan political divide that has enabled the Republican Party to regain control of Congress and attract massive political donations. If states refuse to develop their own plans, and EPA develops plans in their place, this would feed into Republican attempts to portray the President as an out-of-control dictator.[113] Whatever his motivations, Senator McConnell's opt-out proposal has both garnered praise and incited outrage.

D. Opting Out is Not in Western States' Best Interests

While some states may find the opt-out strategy politically appealing, they should reject Senator McConnell's "just say no" advice. States that opt out will miss the opportunity to influence any regional plans that western states may develop under the Clean Power Plan framework. While states would have the opportunity to develop an SIP and take over the planning and implementation process at a later time, it could be too late for those states to meaningfully affect policy. Moreover, opting out is an impractical strategy for western states with utilities that operate in multiple jurisdictions. Finally, opting out could undermine states' nascent renewable energy industries at the very moment when renewable power production could become more lucrative.

States that "opt out" will miss out on opportunities to influence regional plans. Although it is possible that states in the West could pursue a go-it-alone strategy, most observers think that the history of electricity coordination between western states makes it more likely that states would enter into regional plans.[114] States that sit on the sidelines could lose influence in the planning process. For example, some observers believe that Washington, Oregon, and California could enter into a regional implementation agreement that would flow from the states' agreement to cooperate to address climate change and boost renewable energy.[115] The states could potentially attempt to extend California's emissions trading program for greenhouse gases up the Pacific Coast (although that would likely require enacting legislation in Oregon and Washington) or they might instead design a renewable energy credit trading scheme to facilitate renewable power development. Under either context, other states could experience knock-on effects they could not directly control. For example, a regional agreement between the Pacific Coast states could influence the planning decisions of the Northwest Power and Conservation Council (NWPCC), of which Idaho and Montana are members, along with Oregon and Washington. The NWPCC develops five-year plans for energy use and conservation based on a number of assumptions, including economic conditions, regulatory requirements, price forecasts, population growth, and other factors that

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112. Davenport, *supra* note 92.

113. *See generally McConnell letter*, *supra* note 110.

114. See Angus Duncan, Clean Air Act Section 111(d) CO2 Reduction Compliance Pathways for the Pacific Northwest and Intermountain West States, 30 J. ENVTL. L. & LITIG. 303, 319 (2015).

115. *See* Ryan Koronowski, *California, Oregon, Washington, and British Columbia Agree to Cooperate on Reducing Carbon Pollution*, THNNK PROGRESS, Oct. 28, 2013, http://thinkprogress.org/climate/2013/10/28/2850021/california-oregon-washington-british-columbia-agreement/.

contribute to energy consumption.[116] If Oregon and Washington join a regional implementation plan but Montana and Idaho do not, NWPCC would still have to consider how Oregon and Washington's plan would affect the Northwest's energy mix. Thus, sitting the planning process out would not insulate states from the practical effects of a regional plan.

It is true that states could take back their implementation authority from EPA if they were to develop SIPs and receive EPA's approval at some later point. By that time, however, the state would either have to comply individually or join an existing regional plan (or try to create a separate regional agreement, which is unlikely). If a state that had opted out later sought to join a regional agreement, it could find itself at a disadvantage. The details of an emissions trading program could make compliance easier for some states and more challenging for others. As the old adage goes, "if you're not at the table, you're on the menu." Electricity regulators in Ohio made a similar point recently to their own political leaders, noting that an opt-out strategy could unduly tie the state's hands and expose their ratepayers to higher compliance costs.[117]

Opting out is also impractical and risky for utilities that operate in multiple states. PacifiCorp, which has subsidiaries that operate in California, Oregon, Washington, Idaho, Utah, and Wyoming, faces particular risk.[118] Its coal-fired power plants in Utah and Wyoming currently provide a substantial amount of power to the other states. If some of these other states adopt implementation plans that go beyond EPA's proposed guidelines, their reliance on imported coal-based power could drop below expectations. If demand drops substantially, PacifiCorp could find the plants uneconomical to operate, and it could seek rate increases in the states that opted out to compensate for lower demand. While a regional plan could produce these effects as well, utilities and states would at least be able to plan strategically for the anticipated reductions on coal-fired power production. Sitting the planning process out would undermine any strategic efforts.

Finally, states that opt out may miss out on renewable power development opportunities. For example, a Pacific Coast regional renewable energy plan could promote the formation of new long-term contracts and development of new transmission lines to facilitate power deliveries from eastern Washington and Oregon (which have a lot of wind and solar power) to energy-hungry California. Other western states with wind and solar resources might find it more difficult to access California's renewable energy market. Insufficient transmission capacity has already been a hurdle in states like Montana, and a failure to plan at the regional level for renewable power growth could place states like Montana at a further disadvantage.

In sum, while the opt-out idea may sound politically appealing to state leaders who believe the Clean Power Plan is illegal and unwise, the risks of opting out are too great, particularly in the West. States who oppose the Clean Power Plan would be better off following the approach Ohio regulators have advocated: let the political leaders pursue their legal challenges in court, but let the regulators continue planning, just in case. And

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116. *See, e.g.*, *Sixth Northwest Conservation & Electric Power Plan*, NW. POWER & CONSERVATION COUNCIL (2010), https://www.nwcouncil.org/energy/powerplan/6/plan/.

117. Rod Kuckro, *Ohio Regulators Tell Lawmakers to Butt Out on EPA's Clean Power Plan*, ENERGYWIRE, Mar. 27, 2015, http://www.eenews.net/energywire/stories/1060015862/search?keyword=Regulators+Tell+Lawmakers+to+Butt+Out+on+EPA's+Clean+Power+Plan.

118. *About Us, Company Overview*, PACIFICORP, http://www.pacificorp.com/about/co.html (last visited Nov. 8, 2015).

who knows? Maybe the regulators will decide that the Clean Power Plan offers opportunities, not just obligations.

VII. RENEWABLE ENERGY ON PUBLIC LANDS: HOW U.S. POLICY FAILS TO PROMOTE RENEWABLES

NICK LAWTON*******

The United States and the Obama administration purport to promote renewable energy on federal public lands.[119] However, policies in place and in progress fail to create a regulatory environment that promotes renewables nearly as effectively as fossil fuels. Consequently, U.S. energy production from public lands will likely continue to skew toward fossil fuels.

The United States owns roughly 640 million acres of public lands, with most situated in 11 western states.[120] Indeed, the United States owns roughly half of all lands in the West, most of which falls under control of the Bureau of Land Management (BLM) and the United States Forest Service (USFS).[121] In contrast, the United States owns roughly 4% of the land in Eastern states.[122] Thus, public lands management is mostly a western issue.

Because public lands include some areas with excellent access to sun and wind, land management policy is critical to western energy development. The Wilderness Society has estimated that U.S. public lands have the technical potential to generate 2,900 gigawatts of solar power in the Southwest and 206 gigawatts of wind power throughout the West.[123] In comparison, the United States needed 966 GW of generating capacity in 2013 to ensure stable power supplies.[124] Thus, U.S. public lands have the potential to generate far more renewable energy than the nation actually requires.[125]

Because the United States governs public lands with complex regulations, western states face unique challenges for renewable energy development. Nevertheless, western states have overwhelmingly adopted policies requiring renewable energy to satisfy significant shares of state energy use.[126] And these goals will likely grow more rigorous.

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119. *See, e.g.*, Energy Policy Act of 2005, Pub. L. No. 109-58, § 931, 119 Stat. 594, 868 (2005) (setting forth renewable energy development objectives); The President's Climate Action Plan of June 2013, EXEC. OFFICE OF THE PRESIDENT (2013), http://www.whitehouse.gov/sites/default/files/image/president27aclimateactionplan.pdf (noting that "President Obama has set a goal to double renewable electricity generation once again by 2020").

120. Cong. Research Serv., Federal Land Ownership: Overview and Data 1 (2012), https://fas.org/sgp/crs/misc/R42346.pdf.

121. *Id.*

122. *Id.*

123. *Renewable Resource Potential on Public Lands*, WILDERNESS SOC'Y (Oct. 21, 2009), http://wilderness.org/sites/default/files/legacy/Website-Renewable%20Resource%20Potential%20On%20Public%20Lands.pdf.

124. *How Much Electric Supply Capacity is Needed to Keep U.S. Electricity Grids Reliable?*, U.S. ENERGY INFO. ADMIN. (Jan. 23, 2013), http://www.eia.gov/todayinenergy/detail.cfm?id=9671.

125. Of course, to satisfy U.S. energy demand reliably, adequate energy storage and transmission assets would be necessary, and those indispensible elements for a renewably powered grid do not yet exist.

126. *See Renewable Portfolio Standard Policies*, DATABASE OF ST. INCENTIVES FOR RENEWABLES & EFFICIENCY, http://ncsolarcen-prod.s3.amazonaws.com/wp-content/uploads/2015/01/Renewable-Portfolio-Standards-with-Solar-and-DG-Provisions.pptx (last visited Nov. 8, 2015) (showing that most western states have enacted a Renewable Portfolio Standard).

The falling price of renewable energy makes it increasingly desirable,[127] and the federal Clean Power Plan may drive renewable energy development.[128] California has already proposed requiring 50% renewable energy by 2050.[129] Reaching expanded renewable energy development goals—and the ultimate goal of a carbon-free electricity system—will likely require renewable energy from public lands. Both because BLM administers many public lands, and because BLM lands are generally well suited for renewables, most development will likely occur on BLM lands.

Title V of the Federal Lands Policy and Management Act (FLPMA) governs renewable energy development on BLM Lands.[130] Under BLM's current regulations, developers must obtain "rights of way,"[131] which generally are not competitive. BLM issues rights of way for renewables on a first-come, first-served basis, managing competitive leasing only when two developers apply for rights to the same parcel.[132] To obtain a right of way, a developer must submit a development plan, conduct environmental impact analyses, and pay fair market value to the U.S. Treasury.[133] Neither BLM nor states receive revenue directly from rights of way.[134]

Additionally, BLM has begun integrating renewable energy planning into comprehensive Resource Management Plans (RMPs).[135] In this process, BLM identifies lands best suited for renewables and closes other parcels due to conflicts with wildlife or other land uses. Proposed RMPs in which BLM has done this suggest that the agency will likely close many lands to renewables.[136] Because the RMP process requires significant environmental analysis, to which later development can refer, this process will in theory save later developers time and money.

Federal mandates require BLM to permit some renewable energy development. The Energy Policy Act of 2005 requires BLM to approve at least 10,000 megawatts (MW) of

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127. *E.g.*, Silvio Marcacci, *Analysis: 50% Reduction in Cost of Renewable Energy Since 2008*, CLEANTECHNICA (Sept. 11, 2013), http://cleantechnica.com/2013/09/11/analysis-50-reduction-in-cost-of-renewable-energy-since-2008/.

128. *E.g.*, *Renewable Generation in the Clean Power Plan*, CTR. FOR CLIMATE AND ENERGY SOLUTIONS, http://www.c2es.org/federal/executive/epa/carbon-pollution-standards-renewable-energy-map (last visited Nov. 8, 2015) (depicting current renewable energy development and necessary development to meet Clean Power Plan targets).

129. Nick Lawton, *California Governor Jerry Brown Proposes Significant RPS Expansion*, CHARGED DEBATE (Jan. 6, 2015), http://greenenergyinstitute.blogspot.com/2015/01/california-governor-jerry-brown.html.

130. Cong. Research Serv., Energy Projects on Federal Lands: Leasing and Authorization 16 (2012), https://www.fas.org/sgp/crs/misc/R40806.pdf.

131. *Id.* at 17.

132. 43 C.F.R. § 2804.23 (2015).

133. *Id.* at § 2804.12.

134. Competitive Processes, Terms, and Conditions for Leasing Public Lands for Solar and Wind Energy Development and Technical Changes and Corrections, 79 Fed. Reg. 59,022-01, 59,027 (proposed Sept. 30, 2014) (to be codified at 43 C.F.R. pts. 2800, 2880).

135. *E.g.*, BARBARA SHARROW, BUREAU OF LAND MGMT. ,UNCOMPAHGRE FIELD OFFICE RMP PLANNING FACT SHEET: RENEWABLE ENERGY RESOURCES, (2010), http://www.blm.gov/style/medialib/blm/co/field_offices/uncompahgre_field/documents.Par.38352.File.dat/UFO%20RMP%20Fact%20Sheet%207.3%20Renewable%20Energy.pdf.

136. *See* Henry Brean, *BLM Plan Would Tag More of Southern Nevada for Protection*, LAS VEGAS REVIEW-JOURNAL (Nov. 4, 2014), http://www.reviewjournal.com/news/blm-plan-would-tag-more-southern-nevada-protection (noting that the proposed RMP for the Las Vegas region would close more than 10 times as much land as it would designate as appropriate for solar development).

renewables on public lands by 2015,[137] while President Obama's Climate Action Plan requires approval of at least 20,000 MW by 2020.[138] Since 2010, BLM has approved 33 solar projects with capacity of over 8,000 MW, 39 wind projects with capacity of 5,557 MW, and 59 geothermal facilities with capacity of 1,500 MW.[139] Thus, BLM is making progress toward federal goals.

However, in other regards renewable energy development on public lands appears laggardly. The Los Angeles Times reports that in California, BLM has approved only 18 of 375 applications for renewable energy rights of way since 2007.[140] The American Wind Energy Association reports that through 2012, only 1.4% of wind energy was sited on public lands.[141] The Solar Energy Industries Association reports that public lands host only 23% of operational utility-scale solar facilities and only 36% of facilities under construction.[142] And the National Wildlife Federation criticizes current regulations as "outdated and inefficient," inadequate to assess wildlife impacts, and prone to increase "costs and risk to investors."[143] Thus, public lands still pose a daunting challenge for renewable energy.

Both BLM and Congress have proposed reforms that would ostensibly promote renewable energy on public lands. BLM is currently considering comments on a new competitive leasing rule.[144] Meanwhile, the 113th Congress considered, but failed to pass, a similar bill that would also have shared revenues.[145] However, neither measure will significantly alter the regulatory landscape for renewable energy on public lands.

Under BLM's proposed rule, competitive leasing would become the default for renewable energy.[146] The proposed rule aims to channel development to "designated leasing areas" (DLAs) by offering more favorable lease terms for projects located therein, including lower rents and fees.[147] All projects would owe acreage-based rent and a fee based on electricity generating capacity.[148] Revenues would remain with the U.S. treasury.[149]

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137. Energy Policy Act of 2005, *supra* note 119, at § 211, 660.

138. Secretary Jewell Underscores Importance of Landscape-Level Approach, Mitigation in Meeting President's Renewable Energy Goals on Public Lands, U.S. DEP'T OF THE INTERIOR (Aug. 13, 2013), http://www.blm.gov/wo/st/en/info/newsroom/2013/august/NR_08_13_2013.html.

139. *New Energy for America*, US DEP'T OF THE INTERIOR BUREAU OF LAND MGMT. (last updated July 1, 2015), http://www.blm.gov/wo/st/en/prog/energy/renewable_energy.html.

140. Julie Cart, *Gov. Brown's Renewable Energy Plan Could Boost Solar, Wind Industries,* L.A. TIMES (Jan. 7, 2015), http://www.latimes.com/local/california/la-me-renewable-goals-20150108-story.html.

141. *Public Lands and Wind Energy*, AM. WIND ENERGY ASS'N, http://www.awea.org/Issues/Content.aspx?ItemNumber=858 (last visited Nov. 8, 2015).

142. Hearing on Breaking the Logjam at BLM: Examining Ways to More Efficiently Process Permits for Energy Production on Federal Lands Before the S. Comm. on Energy and Nat. Res., 113th Cong. 6 (2014) (testimony of Arthur Haubenstauck, Chair of Utility Scale Solar Power Division, Solar Energy Industries Association), http://www.energy.senate.gov/public/index.cfm/files/serve? File_id=da4d37eb-9f3b-4eae-8c11-7f9c6b0c6f92.

143. , NAT'L WILDLIFE FED'N, PUBLIC LANDS AND RENEWABLE ENERGY DEVELOPMENT ACT OF 2013 FACT SHEET 1 (2013), http://www.nwf.org/pdf/Policy-Solutions/NWF_PLRED2013_Factsheet_final.pdf.

144. Competitive Processes, Terms, and Conditions for Leasing Public Lands for Solar and Wind Energy Development and Technical Changes and Corrections, 79 Fed. Reg. at 59,022.

145. Public Lands Renewable Energy Devolopment Act of 2013, H.R. 596, 113th Cong. § 1 (2013).

146. Competitive Processes, Terms, and Conditions for Leasing Public Lands for Solar and Wind Energy Development and Technical Changes and Corrections, 79 Fed. Reg. at 59,022–23.

147. *Id.* at 59,023.

148. *Id.*

149. *Id.* at 59,027.

BLM's proposed rule would help avoid wildlife and land use conflicts by channeling development to DLAs, but would not otherwise make development easier. In fact, the proposed rule has several weaknesses. BLM recognizes that capacity factors for renewables vary geographically, but the rule would use only one national average,[150] fixing an inappropriately high fee for less sunny or windy climes. Similarly, the rule would charge inflexible fixed fees to variable generators,[151] which would produce hardship in less sunny or windy times. Additionally, the rule inflates capacity fees through reliance on high, outdated wholesale power prices.[152] The greatest defect, though, is delayed gratification. Designating DLAs in RMPs will take years: one proposed RMP in Colorado took 8 years to develop.[153] Consequently, the rule's main incentives will take effect slowly and variably, risking geographical inequity. More fundamentally, the rule focuses more on getting more money out of renewable energy, rather than lowering its costs or easing its access to lands, suggesting that it would not really promote more renewable energy.

The 113th Congress, meanwhile, considered a more helpful bill, but failed to pass it.[154] That bill would also have promoted competitive leasing, but its most interesting feature was royalty sharing. Under the bill, the U.S. Treasury would have received only 10% of revenues, the land-management agency (usually BLM) would have received 15%, and states and counties would have received 25% each. The remaining 25% would have gone to a conservation fund to restore lands or wildlife damaged by renewable energy development. However, despite broad support from states, counties, and environmentalists, the 113th Congress failed to pass this bill. The odds of a similar bill passing the 114th Congress seem negligible.

Thus, neither the current system nor proposed reforms will likely change the regulatory landscape for renewables on public lands. Policies favoring fossil fuels will likely persist. Current approval rates for renewable energy rights of way versus fossil fuel leases suggest the latter are far easier to obtain. The L.A. Times reports that BLM has approved only 18 of 375 renewable energy rights of way in California since 2007.[155] In contrast, Greenwire reports that many companies are stockpiling thousands of unused oil and gas extraction permits.[156] In sum, the federal government's sound and fury about promoting renewable energy on public lands seem to signify nothing.

150. *Id.* at 59,044–45.

151. *Id.* at 59,023.

152. Competitive Processes, Terms, and Conditions for Leasing Public Lands for Solar and Wind Energy Development and Technical Changes and Corrections, 79 Fed. Reg.at 59,045.

153. *KFO & CRVFO RMP Revision General Schedule*, U.S. DEP'T OF THE INTERIOR BUREAU OF LAND MGMT., http://www.blm.gov/co/st/en/BLM_Programs/land_use_planning/rmp/kfo-gsfo/general_schedule.html (last updated Sept. 5, 2014) (showing that RMP revision began in 2006 and ended in 2014).

154. Public Lands Renewable Energy Development Act of 2013, H.R. 596, 113th Cong. (2013).

155. Cart, *supra* note 140.

156. Phil Taylor, *Energy Companies Stockpiling Drilling Permits Across West*, GREENWIRE (Oct. 23, 2014), http://www.eenews.net/greenwire/stories/1060007795.

VIII. UTILITY REFORM IN HAWAII AND NEW YORK: IMPLICATIONS FOR THE NORTHWEST

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The American energy sector is rapidly evolving. Renewables are approaching economic parity with fossil resources,[157] and President Obama has demonstrated a newfound resolve to act to combat climate change.[158] Recognizing the disruptive potential of this evolution, state regulators are beginning to develop reforms to encourage the transition toward a cleaner, smarter, and more resilient electricity system.

Hawaii and New York were among the first states to pursue these reforms in a comprehensive manner. Within a period of four days between April 24 and April 28, 2014, both states issued sweeping proposals to modernize their electric industries. This article examines these proposed reforms and evaluates the impacts these policies may have on the electric industry in the Northwest.

A. Background

Despite the similarities of Hawaii's and New York's proposals, the circumstances that motivated these states to implement reforms differ considerably.

The Hawaiian electricity system is unique in the United States; it is not interconnected with the mainland, it is fueled primarily by imported petroleum, and it boasts the most customer-sited solar generation in the country. Due to these factors, Hawaii has the highest retail electric rates in the nation. As a result, Hawaiians have embraced the state's net metering program, installing rooftop solar on as many as 11% of households on some islands. Additionally, the state boasts the highest Renewable Portfolio Standard (RPS) in the country—40% renewable energy by 2030—with an additional 30% load reduction from energy efficiency. Facing high energy costs, aggressive RPS requirements, and the impending economic parity of some renewable resources with fossil fuel resources, Hawaii's PUC recognized the need to reform its regulatory regime to reflect the state's energy realities and ambitions.

On April 28, 2014, the Hawaii PUC directed the state's investor-owned utilities, which collectively comprise the HECO Companies (HECO) to file plans in accordance with the state's policy objectives. To guide HECO in drafting those plans, the PUC concurrently issued its *Commission's Inclinations on the Future of Hawaii's Electric Utilities* (*Commission's Inclinations*) white paper.[159] HECO subsequently filed its required plans on August 26, 2014.[160]

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157. Diane Cardwell, *Solar and Wind Energy Start to Win on Price vs. Conventional Fuels*, N.Y. TIMES (Nov. 23, 2014), http://www.nytimes.com/2014/11/24/business/energy-environment/solar-and-wind-energy-start-to-win-on-price-vs-conventional-fuels.html?_r=0.

158. *See, e.g.*, *Clean Power Plan*, *supra* note 90.

159. Pub. Util. Comm'n, 314 P.U.R. 4th 49 (Haw. Pub. Util. Comm'n April 28, 2014) [hereinafter Commission's Inclinations] (referencing Exhibit A).

160. As of March 1, 2015, these plans are still awaiting PUC approval. On December 3, 2014, NextEra Energy announced that it had agreed to purchase HECO for $4.3 billion, contingent upon approvals from state and federal regulators. That sale will not impact HECO's filed plans.

The motivating circumstances that culminated in Hawaii's reforms differ from the circumstances in New York. New York deregulated its electric industry in 1996, which means that Independent Power Producers own most of the state's generation facilities and customers can purchase power from over 50 non-utility energy suppliers. Nevertheless, New York has the fifth highest electricity rates in the U.S. [161] In addition, the impacts of Hurricane Sandy highlighted the importance of grid resilience in the state.

On April 24, 2014, in response to directives from the New York Public Service Commission (PSC), the New York State Department of Public Service (DPS) released a staff report and proposal, entitled *Reforming the Energy Vision* (*REV*), which proposed an array of sweeping reforms to the state's electric industry.[162] The following day, the PSC issued an order initiating a two-track proceeding to consider and recommend specific regulatory actions to address the issues raised in the *REV*. [163]

B. Reforms

The utility reform proposals that Hawaii and New York each put forward include a number of policy similarities, despite the divergent circumstances that led the states to initiate reforms. These common elements include the modernization of the distribution system, customer engagement and the development of a market structure to support a modern distribution system, and changes to the regulatory regime to reflect those new realities.

1. Distribution System Managers

In both Hawaii's *Commission's Inclinations* and New York's *REV* proposals, regulators anticipate a transition away from the traditional utility model of electricity generation and delivery towards a more dynamic and flexible system of integrated distributed energy resources (DER), including customer-sited generation, demand response, and energy efficiency. Utility roles will thus need to shift from electricity generators and providers to distribution system managers that facilitate DER development while ensuring system reliability.

In its *Commission's Inclinations* guidance document, the Hawaii PUC highlighted the need for HECO to develop a distribution system that can both deliver power to customers and accept power from distributed resources.[164] To address that need, the PUC ordered HECO to file a plan to modernize the distribution grid.

In its *REV* straw proposal and report, the New York DPS proposed to create entities—Distributed System Platform Providers (DSPPs)—specifically responsible for managing the distribution grid. The New York DPS envisions that DSPPs will play three primary roles in the future of New York's electricity system: 1) operating and maintaining

161. U.S. Energy Info. Admin., *Rankings: Average Retail Price of Electricity to Residential Sector, June 2015 (cents/kWh)*, EIA.GOV, http://www.eia.gov/state/rankings/?sid=NY#series/31 (last visited Nov. 30, 2015).

162. N.Y.S. Dep't of Pub. Serv., Case 14-M-0101, Reforming the Energy Vision, NYS Department of Public Service Staff Report and Proposal (2014) [hereinafter REV].

163. Reforming the Energy Vision, Case 14-M-0101, 2014 WL 1713082, at *6 (N.Y.P.S.C. April 25, 2014) (proc. on motion).

164. Commission's Inclinations, *supra* note 159.

the distribution grid; 2) managing markets and tariffs to monetize DER integration; and 3) serving as an intermediary between retail customers and the transmission grid. The *REV* identifies incumbent distribution utilities as the optimal entities to fill that role.[165]

2. Customer Engagement

In both the *Commission's Inclinations* and the *REV* proposals, customer engagement is deemed important to distribution system operations. Although both states' reforms represent significant departures from the traditional electricity consumer model, customers may still choose to receive bundled electricity service under the proposed reforms.

In Hawaii, where renewable energy is approaching economic parity with traditional resources, the PUC directed HECO to consider upgrading the distribution system to accommodate distributed generation and demand response. Likewise, New York regulators envision widespread participation in an active distribution market, where DER consumers can sell products and services from their systems.

3. Regulatory Reforms

Regulators in both Hawaii and New York proposed rate design and ratemaking reforms to facilitate the modernization of their distribution systems. These rate design reforms attempt to address cost allocation issues and allow customers to select electricity products and services based on their individual needs. The states' proposed ratemaking reforms decouple volumetric electricity sales from utility profits, and instead connect profits with desirable policy outcomes. Rather than discussing both states' rate design and ratemaking reform proposals, the following sections consider Hawaii's proposed rate design reforms and the changes that DPS staff proposed to New York's ratemaking regime.

C. Hawaii's Rate Design Reforms

The Hawaii PUC proposed a number of options for reforming HECO's rate design to address perceived cost allocation issues associated with Hawaii's high levels of distributed generation. These options include: 1) implementing an unbundled retail electricity rate structure, 2) transitioning to capacity-based, fixed-cost based pricing, and 3) adopting a supplemental power supply pricing structure. The mechanics of these options vary, but each would charge DG customers for the grid-related services they consume.

In response, HECO proposed eliminating Hawaii's Net Energy Metering (NEM) program and allocating distribution-related costs among DG customers via fixed charges.[166] HECO asserted that the NEM program creates cost-allocation inequities, because NEM customers do not pay their share of the costs associated with safely and reliably delivering electricity.[167] In place of the NEM program, HECO proposed to compensate DG customers through a tariff rate indexed to a market-based proxy, such as a renewable energy power purchase agreements.[168] In addition to effectively decreasing

165. REV, *supra* note 162, at 25.
166. Commission's Inclinations, *supra* note 159, at 6–7.
167. *Id.* at 6–10.
168. *Id.* at 6–15.

their compensation, HECO proposed to subject DG customers to fixed interconnection and grid services charges.[169] These reforms would significantly diminish the value of consumer-owned DG resources.

D. New York's Ratemaking Reforms

New York's DPS staff proposed a variety of modifications to New York's ratemaking model, including implementing 1) long-term rate plans, 2) outcome (or results-based) ratemaking, 3) symmetrical incentives, and 4) revenue decoupling mechanisms.

First, the *REV* proposed to extend the rate plan period up to eight years, a move which would provide added certainty, reduce expenses related to contested rate cases, and encourage utilities to reduce expenses to achieve higher profits. Second, the *REV* proposed outcome or results-based ratemaking. Rather than incentivizing capital-intensive investments, outcome-based ratemaking would reward utilities for achieving customer value and desirable policy objectives. Third, the *REV* proposed symmetrical incentives, which would retain negative incentives and include positive incentives for utilities that provide high-quality service or otherwise achieve policy goals. Fourth, the *REV* proposed revenue decoupling mechanisms, which remove the connection between a utility's electricity sales volume and its revenue.

E. Impacts in the Northwest

The Northwest electric industry bears little semblance to the industries in Hawaii or New York, and most of the factors driving those states towards comprehensive utility reform are not present in the region. First, Northwestern states generally have among the lowest electricity rates in the country. Second, the region contains a large number of publicly-owned utilities, which are not under the jurisdiction of state regulators. Third, DG penetration in the Northwest is limited, so utilities are not clamoring for cost-recovery reforms to the same extent as in Hawaii. The Northwest, then, has the luxury of adopting a "wait-and-see" approach to comprehensive utility reform.

However, Northwest states will likely have to pursue similar reforms eventually. Federal and state policies, such as the federally-proposed Clean Power Plan, state RPS goals, and widespread net metering programs, will drive the deployment of DERs. States should avoid following a piecemeal approach to reform, which could create impacts that frustrate public policy goals. For example, eliminating net-metering programs without first establishing a robust rate design model will dampen development of DERs. Instead, Northwestern states should monitor the reforms in Hawaii and New York and develop a set of best practices to implement at an appropriate time.

F. Conclusion

Advances in renewable energy technologies and mounting concerns about climate change are driving a transition in the U.S. electric industry, and Hawaii and New York were among the first states to pursue comprehensive utility reforms to address these

169. *Id.* at 6–15.

changes. Regulators in both states proposed similar reforms to encourage the transition to a modern electricity system, including creating entities to manage the distribution system, facilitating customer engagement, and reforming the rate design and ratemaking models to reflect new realities. Although the Northwest electric industry does not yet face the same pressures as the industries in Hawaii and New York, Northwestern regulators should monitor the reform processes in those states, and develop a set of best practices to implement at an appropriate time.

IX. TRANSITIONING FROM COAL TO CLEAN ENERGY IN THE WEST: THE CLEAN POWER PLAN'S IMPLICATIONS FOR THE WESTERN GRID

AMELIA SCHLUSSER*********

In June 2014, EPA issued a draft rule to regulate carbon dioxide emissions from existing electricity generating units in accordance with section 111(d) of the Clean Air Act.[170] This proposed rule, known as the Clean Power Plan (CPP), requires all states to reduce carbon emissions rates from existing power plants by a specified percent below 2012 levels by 2030. In the western United States, these emission goals range from 19% in Wyoming to 72% in Washington. EPA proposed for states to meet these targets through a series of "building blocks," which include increasing coal plant efficiencies, replacing coal power with natural gas, increasing renewable energy generation, and increasing energy efficiency.

The electricity needs of the western United States are served through the Western Interconnection, which is an electrical grid spanning eleven states. As proposed, the CPP will alter the generation mix in the west, which presents significant implications for the grid. Western states currently generate more than 32,000 MW of electricity from coal.[171] Some western states are far more reliant on coal than others; for example, nearly 89% of Wyoming's electricity came from coal in 2013.[172] Coal also played a significant role in shaping the western transmission system. Coal-fired power plants are the primary baseload resources in the intermountain west, and the transmission system was designed to connect these plants to major cities. However, due to the CPP and other state and federal policies, EPA anticipates significant coal plant retirements in the west between 2010 and 2024.[173] The Western Electricity Coordinating Council (WECC)[174] projects that 8,643 MW of western coal generation will retire by 2025.[175] Meanwhile, the CPP's renewable energy target for the west calls for the west to generate an additional 78,811,741 MWh from renewable resources by 2030.[176]

These anticipated changes in the west's generation mix create challenges and opportunities for transmission planning and grid modernization throughout the region. On the one hand, the anticipated coal plant retirements will significantly reduce the west's baseload generating capacity, which may create reliability concerns for the grid. On the

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170. *Clean Power Plan*, *supra* note 90.

171. W. ELEC. COORDINATING COUNCIL, EPA CLEAN POWER PLAN: PHASE I – PRELIMINARY TECHNICAL REPORT 12 (2014), https://www.wecc.biz/Reliability/140912_EPA-111(d)_PhaseI_Tech-Final.pdf [hereinafter WECC CPP REPORT](Figure 3: Resource Mix in US Portion of the Western Interconnection).

172. *Wyoming: State Profile and Energy Estimates*, U.S. ENERGY INFO. ADMIN., http://www.eia.gov/state/?sid=WY#tabs-4 (last updated Aug. 21, 2014).

173. WECC CPP REPORT, *supra* note 171, at 15.

174. The Western Electricity Coordinating Council is the regional reliability council for the Western Interconnection.

175. WECC CPP REPORT, *supra* note 171, at 13, 16. These projections are based on known and announced retirements.

176. *GHG Abatement Measures*, U.S. ENVT'L PROT. AGENCY OFFICE OF AIR AND RADIATION (June 10, 2014), http://www2.epa.gov/sites/production/files/2014-06/documents/20140602tsd-ghg-abatement-measures.pdf.

other hand, this presents an opportunity to replace polluting coal power with sustainable renewable energy resources.

A. The Challenges: Transmission Constraints and Reliability Concerns

The western United States has the potential to generate more than enough renewable energy to satisfy the CPP's emission reduction requirements. However, there are two primary challenges to deploying high levels of renewable energy over the western grid. First, the west lacks the infrastructure necessary to connect remote, high-quality renewable energy hubs to major load centers. Second, replacing baseload coal power with variable renewable energy can create reliability and integration challenges. Fortunately, these challenges are not insurmountable and they provide an opportunity to create a sustainable, reliable grid.

1. Transmission Constraints

The Western Governors Association's Western Renewable Energy Zones (WREZ) initiative identified a number of "hubs" with access to high-value renewable energy.[177] These WREZ hubs have the potential to provide all of the substitute energy required under the proposed CPP, but a lack of transmission access impedes development at these sites. Renewable energy developers generally are not interested in constructing projects in remote areas unless transmission already exists or there is a high degree of certainty that transmission will be constructed in the near future. Because many WREZ hubs are in remote areas without transmission access, western states will need to expand and optimize the grid to access these high-quality resources.

However, western grid expansion faces a number of hurdles. The main obstacles for developing interstate transmission include 1) demonstrating that new transmission is needed and in the public interest; 2) siting challenges, including inconsistent and uncoordinated regulatory frameworks; and 3) cost allocation and recovery challenges. These constraints present significant uncertainty for potential transmission developers and make it difficult for developers to secure financing, obtain necessary approvals and permits, and recover costs from ratepayers.

2. Reliability Concerns

Grid reliability depends on the transmission operator's ability to balance load (i.e. energy demand) and resource availability (i.e. generation) within the transmission system at all times. The National Energy Regulatory Commission (NERC) recently issued an *Initial Reliability Review* of the CPP, which expressed concerns that the rule could compromise the reliability of the U.S. power grid.[178] NERC's concerns are premised on the understanding that baseload resources inherently promote grid reliability and stability by providing stable energy output to satisfy consumer energy demand. Variable

177. *See* Lisa Schwartz, Renewable Resources and Transmission in the West: Interviews on the Western Renewable Energy Zones Initiative, W. Governors' Ass'n (2012), www.raponline.org/document/download/id/4797.

178. N. AM. ELEC. RELIABILITY CORP., POTENTIAL RELIABILITY IMPACTS OF EPA'S PROPOSED CLEAN POWER PLAN: INITIAL RELIABILITY REVIEW (2014), http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/Potential_Reliability_Impacts_of_EPA_Proposed_CPP_Final.pdf.

renewable resources, such as wind or solar power, generally cannot adjust their output to reflect changes in demand. Because grid operators must ensure that power levels in the grid remain in balance at all times, managing variable renewable resources can be a challenge.

Changes in the size or location of available generating resources make it difficult for grid operators to maintain balance on the system. NERC's *Initial Reliability Review* warned that implementation of the proposed CPP may strain the grid's "Essential Reliability Services," which are necessary to maintain balance between supply and demand.[179] These services include 1) generation and load balancing; 2) voltage stability; and 3) frequency response. In the western grid, baseload coal plants help maintain voltage stability within an acceptable range and respond to changes in frequency following sudden losses of generation or load. Coal retirements in the region will reduce availability of these reliability services. At the same time, increases in variable renewable generation may require additional ramping of existing baseload resources, which could impose an extra strain on existing resources.

The coal retirements called for under the proposed CPP may impose short-term reliability constraints on the western grid, and increased deployment of variable renewable resources will initially strain the flexibility of the grid. However, western states can mitigate these challenges through a coordinated, strategic effort to modernize the grid.

B. The Solutions: Modernizing the Grid

By promoting strategic transmission development, optimizing grid operations, and deploying advanced technologies, western states can increase the capacity and efficiency of the grid and effectively integrate large amounts of renewable energy onto the system. These investments will enable the west to transition from coal-fired power to renewable power without sacrificing grid reliability, stability, or flexibility.

Western states can incentivize strategic interstate transmission development by implementing comprehensive transmission planning policies, coordinating siting requirements, and revising cost allocation methods to incentivize optimal regional development. First, states and transmission providers should engage in coordinated planning to identify both new and existing transmission facilities that can meet the region's needs under the CPP.[180] If this planning process identifies a need for new transmission facilities, planners should prioritize development in areas that provide the greatest access to high-quality renewable resources. Second, regulators should establish a uniform, streamlined process for siting, approving, and constructing interstate transmission lines. Third, regulators should establish cost allocation mechanisms to apportion transmission costs fairly among all beneficiaries.[181]

179. *Id.* at 2, 18.

180. The Federal Energy Regulatory Commission's (FERC) Order 1000 directs each public utility transmission provider to participate in a regional transmission planning process that produces a regional transmission plan. Order 1000, *supra* note 61.

181. FERC's Order 1000 also requires the regional planning process to establish a regional cost allocation method that allocates the costs of new regional or interregional transmission facilities among the facility's beneficiaries "in a manner that is at least roughly commensurate with the estimated benefits of that facility in each of the transmission planning regions." *Id.* at 589.

Western states can effectively integrate high levels of renewable energy onto the grid without compromising reliability by optimizing grid operations, implementing advanced technologies, and adopting regional market-based mechanisms to increase transmission efficiency. First, western states can optimize grid operations to balance increasingly variable loads. This entails promoting geographically diverse resource development, improving forecasting processes, implementing intra-hour scheduling, improving reserve sharing, and enabling dynamic transfers between balancing areas. Second, western states can deploy advanced technologies to increase transmission capacity on existing lines. These technologies include smart grid-enabled demand response, dynamic line rating systems, and increased deployment of energy storage, distributed generation, and non-variable renewable resources. Finally, western states can explore regional market-based approaches, such as Energy Imbalance Markets, that may allow more efficient use of existing transmission by providing real-time access to unused transmission capacity across the region.

C. Conclusion

Implementing the CPP will present a number of challenges for the western grid, yet it also provides an opportunity to modernize and optimize the grid to accommodate more sustainable energy resources. The grid is a highly interconnected system, and shifts in one state's resource mix may cause reliability issues in other states. Therefore, if states choose to implement the CPP by themselves, the entire grid may suffer. Western states should instead work together in a cooperative, collaborative manner to preemptively address inevitable changes in the western resource mix. In doing so, states should strategically invest in facilities, technologies, and operational practices that strengthen the western grid as a whole and facilitate the transition to a clean, renewable energy sector.