NATURAL GAS IS CHANGING THE CLEAN ENERGY GAME, BUT THE GAME IS NOT OVER

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Not everyone appreciates that environmental regulation and energy law are inherently, and inextricably, linked.[1] Electricity generation for industrial and residential consumers was one of the major drivers behind environmental regulation, but despite this long-standing connection,[2] environmental law and energy law have often operated in separate silos. This fact has led to disjointed and ineffective policy and a poor understanding of the full scope of legal, regulatory, and business issues in the energy sector. This is finally beginning to change.

In his article, *Clean Energy Federalism*, Professor Felix Mormann analyzes the keys facets of how energy law and environmental law intersect, as he considers how to implement a program to "decarbonize America's energy economy."[3] In this forward-thinking piece, Professor Mormann considers the potential role of renewable portfolio (RPSs) and feed-in tariffs (FITs) and how concurrent implementation at the federal and state level could support a lower-carbon energy future.[4] His conclusion—"that one clean energy policy (RPS) be implemented at the federal and another (FIT) at the state level"—is likely correct from a policy-optimization perspective.[5] Still, as Professor Mormann acknowledges, such policies can face enormous political hurdles.[6]

One of the biggest hurdles are the costs incurred (and still being incurred) by existing generating facilities. Fossil fuels continue to dominate the U.S. electricity sector, and change is coming, but slowly. For 2015, though down from 52% in 2000,[7] coal still provided 33% of the nation's electricity; natural gas provided another 33% of generation

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1. Lincoln L. Davies, *Power Forward: The Argument for A National RPS*, 42 CONN. L. REV. 1339, 1391–92 (2010) (footnotes omitted) ("It is well-documented that energy and environmental law operate in separate worlds that rarely overlap, despite the fact that their subject matters are intrinsically intertwined.")

2. *Id.* at 1392. ("Energy and the environment are two sides of the same problem. Energy law dictates our resource use; environmental law controls the effects of that use. Energy use drives our ecological problems; those problems cause us to question how we use energy.")

3. Felix Mormann, *Clean Energy Federalism*, 67 FLA. L. REV. 1621, 1626–27 (2015).

4. *See id.* at 1624–26, 1627–28.

5. *Id.* at 1672.

6. *Id.* at 1654 ("More than two decades of fruitless congressional debate over a federal RPS offer ample proof of the enormous challenges of building support for a strong federal commitment to renewable energy.").

7. U.S. ENERGY INFO. ADMIN., DOE/EIA-0226, ELECTRIC POWER MONTHLY 1 (2001), http://www.eia.gov/electricity/monthly/archive/pdf/02260103.pdf.

by utility-scale facilities.[8] Natural gas increased from 16% in 2001, meaning that gas accounted for 17% of the 19% decline in coal generation.[9] The data makes clear: Nothing displaces coal faster than natural gas.

Nuclear power makes up another 20% of generation, meaning that only about 13% of electricity comes from renewable sources (hydropower: 6%; biomass: 1.6%; geothermal: 0.4%; solar: 0.6%; wind: 4.7%).[10] Although fossil fuels and nuclear are still the largest generators, and natural gas is clearly the big winner of late, the amount of electricity generation from renewables has increased significantly. Electricity generation from wind has shown a particularly significant increase, jumping from 0.1% to 4%.[11]

As such, despite still representing less than 15% of the overall generation market, there is evidence that renewables are starting to make strides in the sector alongside the more traditional big-time players.[12] On the world stage, renewable energy installations are continuing to increase—even as subsidies for renewables fall—because prices are continuing to decrease.[13] The energy sector can be expected to continue its diversification, in part because diversification is valuable for utility reliability and resilience, as well as for financial management purposes.[14] For developing nations, these changes are linked more to energy security and environmental concerns like clean air, than they are to a pursuit of low-carbon policies.[15]

Sometimes lost in the discussion about cleaner energy is that climate concerns are not the only reasons to consider renewable resources. Cleaner air, more stable prices, and locally sourced energy are also good reasons to consider renewable energy sources to supplement or replace more traditional generation resources.[16] Prices are a major factor, of

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8. *Frequently Asked Questions: What is U.S. Electricity Generation by Energy Source*?, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/tools/faqs/faq.cfm?id=427&t=3 (last visited July 12, 2016).

9. U.S. ENERGY INFO. ADMIN., *supra* note 16, at 1.

10. *See supra* note 7.

11. *How is The Fuel Mix for U.S. Electricity Generation Changing?*, U.S. ENERGY INFO. ADMIN (Feb. 19, 2016) https://www.eia.gov/energy_in_brief/article/fuel_mix_for_elect_generation.cfm.

12. *Renewable Energy: Not a Toy*, THE ECONOMIST (Apr. 11, 2015) http://www.economist.com/node/ 21647975/print.

13. *Id.*

14. *Id.*

15. *Id.* ("Nearly half of last year's investment was in developing countries, notably China, whose energy concerns have more to do with the near term than with future global warming. It worries about energy security, and it wants to clean up its cities' air, made filthy partly by coal-burning power plants.").

16. *Benefits of Renewable Energy Use,* UNION OF CONCERNED SCIENTISTS, http://www.ucsusa.org/clean_energy/our-energy-choices/renewable-energy/public-benefits-of-renewable.html#.V31rPk9TGUk (last visited July 2, 2016).

course, but as price differences decrease, other considerations will take a more prominent role in the analysis.

The closing of the price differential between resources has helped renewables, especially wind, increase their portion of the generation fuel mix,[17] but dramatic swings in prices for any resource can make the market, and relevant laws and policies, hard to predict. Recent price drops in the natural gas market, facilitated by dramatic increases in available quantities due to shale production using horizontal drilling and hydraulic fracturing, have made fuel switching to natural gas an even more attractive option under the current energy and environmental regime.[18] In 2008, before the shale gas boom took hold, as much as 90% or more of new electric generation was fueled by natural gas.[19] Now, with lower gas prices, the fuel switching has continued at pace, with the bulk of the new natural gas generation replacing coal-fired generation.[20] This is a positive development for those looking to displace coal, but the change to natural gas also delays at least some of the shifting to renewables.

But all is not lost. The coal-fired generation that is displaced by natural gas could create at least some opportunity for a parallel increase in generation from renewable energy sources[21] because low natural gas prices will change some of the prior renewable market analyses. Some time ago, for example, the U.S. Energy Information Administration (EIA) determined that a 15% national RPS would result in an increase in retail electricity prices of roughly 1% over the 2005 to 2030 test period.[22] The EIA also analyzed a national RPS scheme with a 25% renewables mandate that determined the average retail electricity price would increase 6.2% under that test case.[23]

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17. *See supra* note 11.

18. *See* Joshua P. Fershee, *Facts, Fiction, and Perception in Hydraulic Fracturing: Illuminating Act 13 and* Robinson Township v. Commonwealth of Pennsylvania, 116 W. VA. L. REV. 819, 826, 863 (2014).

19. *See* Joshua P. Fershee, *Changing Resources, Changing Market: The Impact of A National Renewable Portfolio Standard on the U.S. Energy Industry*, 29 ENERGY L.J. 49, 57 (2008) (noting that in 2008 natural gas for electricity generation was being imported from other countries); U.S. GEN. ACCT. OFFICE, GAO-03-46, NATURAL GAS: ANALYSIS OF CHANGES IN MARKET PRICE 19 (2002), http://www.gao.gov/cgi-bin/getrpt?GAO-03-46 ("[N]atural gas is now the preferred source of energy for most new electric generation capacity.").

20. *See supra* note 8 and accompanying text.

21. *See* Fershee, *supra* note 18, at 826, 863.

22. U.S. ENERGY INFO. ADMIN., SR/OIAF/2007-03, IMPACTS OF A 15-PERCENT RENEWABLE PORTFOLIO STANDARD iv (2007), http://www.eia.gov/oiaf/servicerpt/prps/pdf/sroiaf(2007)03.pdf.

23. ENERGY INFO. ADMIN., SR/OIAF/2007-05, ENERGY AND ECONOMIC IMPACTS OF IMPLEMENTING BOTH A 25-PERCENT RENEWABLE PORTFOLIO STANDARD AND A 25-PERCENT RENEWABLE FUEL STANDARD BY 2025, xi (2007), http://www.eia.doe.gov/oiaf/servicerpt/eeim/pdf/sroiaf(2007)05.pdf.

In doing those reviews, though, the EIA use pre-shale development natural gas prices to calculate their predictions. The numbers assume a modest price decline for natural gas (and coal) because increased renewable energy sources for electricity generation would reduce demand for other fuel sources.[24] Another study predicted that a 15% federal RPS would lower the price of power overall and reduce demand for natural gas.[25] Again, though, all of these studies were conducted at a time when natural gas supplies were not expected to increase dramatically, and prices were up to three times higher than current prices.[26] As such, today's low natural gas prices, along with declining prices for renewable generation, would make mandating renewable energy usage through an RPS and a FIT less expensive today than it would have been in the 2007 models.[27]

As such, some may believe that low natural gas prices undercut the option Professor Mormann suggests is possible—the use of an RPS and FITs. That is not necessarily the case. Professor Mormann's option is still a reality, and the likelihood of success is more a question of priority than opportunity. In states with existing renewable energy mandates, natural gas-fired electricity generation can help facilitate integrating new renewable electricity generation, which is already needed to meet current RPS mandates.[28] The new natural gas-fired generation can be an

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24. U.S. ENERGY INFO. ADMIN., *supra* note 17, at 1; U.S. ENERGY INFO. ADMIN., *supra* note 23, at 16; *see also* Lincoln L. Davies, *Power Forward: The Argument for A National RPS*, 42 CONN. L. REV. 1339, 1374 (2010) (noting that many RPS proponents claim that renewables would help lower natural gas prices through reduced natural gas demand).

25. Woods MacKenzie, Press Release, *Federal Renewable Portfolio Standard Will Reduce Power and Natural Gas Costs, But Not Have a Significant Impact on GHG Emission Levels* (Mar. 2007), http://www.woodmacresearch.com/cgi-bin/wmprod/portal/corp/corpPressDetail.jsp?oid=826210; *see also* Joshua P. Fershee, *Changing Resources, Changing Market: The Impact of a National Renewable Portfolio Standard on the U.S. Energy Industry*, 29 ENERGY L.J. 49, 58–61 (2008) (discussing the possible impacts of the various scenarios).

26. *Natural Gas Prices*, U.S. ENERGY INFO. ADMIN. (June 1, 2016), http://www.eia.gov/dnav/ng/hist_xls/N9190US3a.xls. Nationally, wellhead natural gas prices were, per thousand cubic feet, as follows: 2007: $6.25; 2008: $7.97; 2009: $3.67; 2010: $4.48; 2011: $3.95; 2012: $2.66. *Id.* More recent pricing data is available for the Louisiana natural gas wellhead. *Natural Gas Wellhead Price*, CTR. FOR ENERGY STUDIES, http://www.enrg.lsu.edu/cgi-bin/natgas.php (last visited June 1, 2016). The average wellhead price between January 2013 and October 2015 was $3.64 per MCF. *Id.* (calculation done by author). The highest monthly average price per MCF was $5.71 in February 2014. *Id.* The lowest was also the most recent data available: $2.34 (October 2015). *Id.*

27. Lower natural gas prices would, though, likely result in cheaper electricity for all instances predicted in 2007, with or without implementation of an RPS or FIT. *Cf. id.*

28. Solar power resources are, in some cases, already backed up by natural gas generating facilities. *See, e.g.*, Angela Neville, *Top Plant: Martin Next Generation Solar Energy Center, Indiantown, Martin County, Florida*, POWER (Dec. 1, 2011), http://www.powermag.com/top-plantmartin-next-generation-solar-energy-center-indiantown-martin-county-florida.

important firming resource[29] for wind and solar energy, which are intermittent power resources.[30] These new gas generation facilities are replacing coal-fired units that were effective base-load power sources, but did not work with intermittent renewable resources because they do not cycle on and off (or up and down) efficiently or cost effectively.

This flexibility that many natural gas plants can offer may prove critical to increasing renewable energy resources in the United States. The National Renewable Energy Laboratory (NREL) conducted a study that suggested higher levels of intermittent solar and wind energy are likely to require "greater operational flexibility in fossil energy power plants."[31] Cycling up and down existing (meaning older) natural gas and coal generation facilities to accommodate integration of renewable resources can negatively impact things like operation and maintenance costs, emissions, and heat rates, but new generation plants, "particularly natural gas combustion turbine and combined cycle plants," are designed to incorporate this type of operational flexibility that minimizes or eliminate such penalties.[32]

These changes mean that many of the assumptions underlying existing RPS policies, and the future impact of renewables, are evolving. But instead of being an impediment, natural gas can be an opportunity for new and creative applications of new renewable generation technologies. Professor Mormann makes a compelling case that his proposed model for closely integrating both RPS and FIT policies can lead to a "better, more efficient allocation of investor and regulatory risk."[33] The emergence of cheap and abundant natural gas does not change that. In fact, it can support those policies. However, to be successful, any RPS and FIT policies must account for this changed reality.

One of the key strengths of Professor Mormann's theoretical framework is that his proposal adapts well to this new reality. Now is the time for lawmakers and regulators to put his plan into practice in pursuit of a clean, or at least cleaner, energy future. Natural gas can be part of the answer, but only if we let it.

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29. *See* Herman K. Trabish, *Getting Natural Gas, Solar, and Wind to Play Well Together*, GREENTECHMEDIA (June 21, 2013), http://www.greentechmedia.com/articles/read/Getting-Natural-Gas-Solar-and-Wind-to-Play-Well-Together.

30. Felix Mormann, *Requirements for a Renewables Revolution*, 38 ECOLOGY. L.Q. 903, 923 (2011) (stating that intermittency of renewable resources like wind and solar energy are "likely to require substantial grid reinforcements to handle the load peaks when . . . operating at full capacity").

31. NAT'L RENEWABLE ENERGY LAB., 1 RENEWABLES ELECTRICITY FUTURES STUDY 1–15, http://www.nrel.gov/docs/fy12osti/52409-1.pdf (last visited Mar. 14, 2014).

32. *Id.* ("[S]ome new power plants, particularly natural gas combustion turbine and combined cycle plants, are designed for flexible operation without these penalties.").

33. Mormann, *supra* note 3, at 1681.