

The Only Green That Matters Is the Green in Your Pocket: Advocating for Renewable Energy in Red States

Noah Guiney*

Addressing the threat of climate change will require a large-scale transition from fossil fuel-generated power to renewable energy. However, climate change has been politicized in the United States to such an extent that many states' lawmakers resist embracing wind and solar power for the simple reason that it is favored by liberals. Fortunately, there are now economic as well as environmental reasons why republican lawmakers should encourage solar and wind sectors in their states. This Note looks at how two traditionally "red" states—Texas and Arizona—have engaged with renewable energy. As this Note shows, Texas embraced wind power because it created jobs, improved reliability and lowered residents' energy bills. In Arizona, despite the size of the solar industry in the state, solar power remains controversial, in large part because most of the power is exported to California, giving little direct benefit to ordinary Arizonans. The Note concludes by arguing that renewable energy advocates should focus on the economic good that the industry can do in states that are traditionally skeptical of climate change.

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INTRODUCTION

In the winter of 2015, about six months before my wife and I moved to California, Boston experienced the worst winter in recorded history. Five consecutive weeks saw five consecutive blizzards, and by the end of March the city had suffered through 108.6 inches of snow.¹ I did not mind the freezing walks to the train station or the squelching of the snow as it leaked into my boots. But I felt that winter in my bank account.

In 2016, Massachusetts got 66 percent of its energy from natural gas-fired power plants.² This gas travels through the same pipelines as the gas used to heat over 50 percent of the homes in the state.³ Every winter this causes a shortage, and as temperatures drop electricity prices skyrocket.⁴ Consumers across the country can relate to my experience, and the majority of them do not have the luxury of thinking in the abstract about energy prices. For many, a winter price hike is not a talking point. It means a scaled-back Christmas, or a decision about which rooms in your apartment to heat at night.

Despite the worries of everyday ratepayers, many advocates think about environmental issues from a global perspective. And some of the issues facing today's environmentalists are global in scope. For example, the United States' recent decision to withdraw from the Paris Climate Accord threatens to undo the first planet-wide agreement on fighting climate change.⁵

However, just because the problems are global does not mean that the solutions have to be as well. What many environmental advocates fail to realize is that everyday, local issues present a financial opportunity to create environmental change. Take Massachusetts: ratepayers in the Bay State are subjected to price hikes for the simple reason that too much of their energy comes from natural gas power plants.⁶ If many of those plants were replaced by wind

1. *Frozen Over: Boston's Record Winter*, BOS. GLOBE, <https://www.bostonglobe.com/metro/specials/winter2015> (last visited Sept. 3, 2018).

2. *Massachusetts: Profile Overview*, U.S. ENERGY INFO. ADMIN., <https://www.eia.gov/state/?sid=MA> (last visited May 14, 2018).

3. *How Massachusetts Households Heat Their Homes*, MASS.GOV, <https://www.mass.gov/service-details/how-massachusetts-households-heat-their-homes> (last visited Sept. 3, 2018).

4. See, e.g., *Regional Wholesale Markets: December 2016*, U.S. ENERGY INFO. ADMIN. (Feb. 24, 2017), https://www.eia.gov/electricity/monthly/update/archive/february2017/wholesale_markets.php.

5. Michael D. Shear, *Trump Will Withdraw U.S. from Paris Climate Agreement*, N.Y. TIMES (June 1, 2017), https://www.nytimes.com/2017/06/01/climate/trump-paris-climate-agreement.html?_r=0.

6. Jack Newsham, *Electric Rates in Mass. Set to Spike This Winter*, BOS. GLOBE (Sept. 25, 2014), <https://www.bostonglobe.com/business/2014/09/25/national-grid-projects-percent-increase-for-winter-electricity-rates/MB181NGxTljzr56PZCD7QK/story.html>.

farms and solar plants, that fuel shortage would be much less pronounced.⁷ In other words, ratepayers have both economic and environmental reasons to invest in renewable energy.

Just as environmental opportunity is local, so too are the mechanisms for taking advantage of it. State and regional lawmakers set much of the United States' energy policy, responding to the problems of their constituents. And in every state there is legislation that, at least on some level, empowers states and state agencies to think critically about energy rates.⁸ While many politicians are skeptical of the threat of climate change, all politicians are receptive to the economic wellbeing of their constituents. Instead of trying to convince lawmakers of the environmental virtues of green energy, environmental advocates should focus on the economic benefits of renewable energy to ratepayers. This Note will show that political messaging that focuses on the economic benefits of renewable energy is the best way to promote renewable energy-friendly policies, even in conservative states. In particular, this Note uses state-level case studies to show the importance of messaging: Texas, as an example of the right way to sell renewable energy in conservative states, and Arizona, as the wrong way to sell renewable energy in conservative states. Further, this Note will use California as a case study to show how renewable energy affects the wholesale prices of electricity.

I. THE IMPORTANCE OF MESSAGING: THE PARIS CLIMATE ACCORD

It is a truism in politics that the way you sell something can be more important than the thing you are selling.⁹ America's relationship with climate science is a reminder of that fact.

The debate over climate change in America has two sides that map imperfectly over the country's partisan divide. On one side there are people and states, generally with Democratic politics and governments, who support policies aimed at mitigating the risks of global warming.¹⁰ The other side is made up of those—often identifying as Republican—who see these policies as an impediment to economic growth.¹¹ Both sides have only become more

7. See, e.g., *Regional Wholesale Markets: December 2016*, *supra* note 4.

8. See generally *Database of State Incentives for Renewables and Efficiency*, DSIRE, www.dsireusa.org (listing each state's energy efficiency incentives) (last visited Mar. 10, 2018).

9. See generally Warwick Smith, *Why Politicians Must Lie – and How Selling Ice-Creams Is Like an Election Campaign*, *GUARDIAN* (Aug. 26, 2014), <https://www.theguardian.com/commentisfree/2014/aug/27/why-politicians-must-lie-and-how-selling-ice-creams-is-like-an-election-campaign> (describing how many political contenders in developed democracies fall fairly close on the political spectrum, and therefore are forced to separate themselves from their opponents through lies).

10. See Jim Norman, *Democrats Drive Rise in Concern About Global Warming*, *GALLUP NEWS* (Mar. 17, 2017), <http://news.gallup.com/poll/206513/democrats-drive-rise-concern-global-warming.aspx>.

11. See *Energy and Environment*, *GOP*, <https://www.gop.com/issue/energy-and-environment> (last visited Mar. 10, 2018). It is worth noting that more and more self-identified Republicans are accepting that humans are causing climate change. See Norman, *supra* note 10.

entrenched in their ideas about climate change as the political landscape in the United States has become more partisan; views on climate change are now often litmus test issues for politicians.¹²

As climate change policy has become more about politics than science,¹³ the role of messaging in climate change policy has become more important. And there is perhaps no one whose rhetoric has had a greater impact on energy policy in the United States today than President Donald Trump. On the campaign trail he pledged early and often to withdraw from the Paris Climate Accord, one of the signature diplomatic achievements of his predecessor, President Barack Obama.¹⁴ To do so President Trump tapped into the “jobs versus the environment” argument that has characterized the debate for decades.¹⁵ However, he did so more aggressively—and arguably with more success—than climate-skeptic Republicans have done in the past. For example, he repeatedly argued against the “war on coal” and positioned himself as the protector of blue-collar coal miners against the evils of governmental environmental regulation.¹⁶ He attacked the science behind these environmental policies, insisting that climate change was a “hoax” perpetrated by the Chinese as a way to make American businesses less competitive,¹⁷ further building on the anti-intellectual rhetoric that had become prevalent in conservative discourse about global warming.¹⁸

All of these arguments came to a head when President Trump announced that the United States was withdrawing from the Paris Climate Accord on June 1, 2017.¹⁹ Trump justified his withdrawal by saying that he “was elected to represent the citizens of Pittsburgh, not Paris,” and that the American people had to be protected against the “draconian” measures of the international deal.²⁰ The reference to Pittsburgh was a clear nod to the working class; the city was one of

12. Coral Davenport & Eric Lipton, *How G.O.P. Leaders Came to View Climate Change as Fake Science*, N.Y. TIMES (June 3, 2017), <https://www.nytimes.com/2017/06/03/us/politics/republican-leaders-climate-change.html>.

13. *Id.*

14. Louis Jacobson, *Trump-O-Meter: Cancel the Paris Climate Agreement*, POLITIFACT (Jan. 26, 2017), <http://www.politifact.com/truth-o-meter/promises/trumpometer/promise/1379/cancel-paris-climate-agreement>.

15. *Id.*

16. *Trump at West Virginia Rally: 'We Are Putting Coal Miners Back to Work'*, KCRA (Aug. 3, 2017), <http://www.kcra.com/article/trump-promises-very-big-announcement-at-west-virginia-campaign-rally-1501799518/11372383>.

17. Edward Wong, *Trump Has Called Climate Change a Chinese Hoax. Beijing Says It Is Anything But.*, N.Y. TIMES (Nov. 18, 2016), <https://www.nytimes.com/2016/11/19/world/asia/china-trump-climate-change.html>.

18. See Phil Plait, *The GOP's Denial of Science Primed Them for the Illogic of Trump*, SLATE (June 30, 2016), http://www.slate.com/blogs/bad_astronomy/2016/06/30/donald_trump_is_the_inevitable_result_of_decades_of_gop_denial_of_reality.html. *But see* Mischa Fisher, *The Republican Party Isn't Really the Anti-Science Party*, ATLANTIC (Nov. 11, 2013), <https://www.theatlantic.com/politics/archive/2013/11/the-republican-party-isnt-really-the-anti-science-party/281219/>.

19. See Shear, *supra* note 5.

20. *Id.*

the great centers of American industry during the first half of the twentieth century.²¹ As Obama-Democrats are seen as out-of-touch international elites by many Trump voters,²² the President's mention of Paris was also a coded reference. Thus, Trump successfully painted the Paris Climate Accord as an attempt by an international group of politicians and their cronies to swindle Americans out of their hard-earned cash. The fact that the Accord was about global warming was irrelevant.²³

If climate science was meaningless to President Trump's decision to pull out of the Paris Climate Accord, and insignificant for his audience, then it does not make sense for green energy advocates to put climate science at the center of their arguments. Instead, they should focus on ways to make renewable energy fit within the "jobs and economy" rhetorical framework already established by Republican lawmakers. Fortunately, renewable energy advocates may do so easily. Renewable energy has shown itself to be a giant economic boon in the states that have embraced it by creating jobs and lowering energy prices. If there is one lesson that environmentalists learn from the fight over the Paris Climate Accord, it should be that the people who find climate science convincing have already been convinced. Now, the focus should be on making economic arguments to convince the rest.

II. OVERVIEW OF RENEWABLE ENERGY

Before this Note explores the messaging around renewable energy deployment, it is important to understand the way renewable energy works and how it fits into the American energy market. Twenty-five percent of the carbon dioxide that humans pour into the atmosphere comes from energy production and home heating, making it the largest single source of emissions worldwide.²⁴ Any efforts that aim to limit global warming must involve a significant, worldwide shift from fossil fuel generated power to renewable energy sources. Increasingly, renewable energy has come to mean wind and solar power.²⁵

21. See generally STEFAN LORANT, *PITTSBURGH: THE STORY OF AN AMERICAN CITY* (5th ed. 1999) (tracing Pittsburgh's frontier beginnings to its growth into one of the most heavily industrialized cities in the world).

22. See Robby Soave, *President Obama: Perception of Democrats as 'Latte Sipping, Politically Correct' Hurt Them*, REASON (Dec. 16, 2016), <http://reason.com/blog/2016/12/16/president-obama-perception-of-democrats>.

23. It is interesting to note that President Trump's rationale for withdrawing from the Paris Climate Accord is very similar to his reasons for opposing the North American Free Trade Association and the Trans-Pacific Partnership, both of which are free trade deals that the President thinks unfairly hurt American workers. See Gregory Krieg, *Donald Trump's Art of Undoing the Deal*, CNN (Oct. 6, 2017), <http://www.cnn.com/2017/10/06/politics/donald-trump-ending-deals/index.html>.

24. *Global Greenhouse Gas Emissions Data*, EPA, <https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data> (last updated Apr. 13, 2017).

25. Solar and wind power offer the opportunity to generate power without the negative environmental consequences associated with hydroelectric dams. For an overview of the greenhouse gas emissions related to hydroelectric power, see Nathan Barros et al., *Carbon Emission from Hydroelectric Reservoirs Linked to Reservoir Age and Latitude*, 4 NATURE GEOSCIENCE 593, 594-96 (2011).

In many ways wind power is more of a traditional energy source than solar. Much like coal or natural gas-fired power plants, wind farms are generally located out of sight of most energy customers and can produce large amounts of energy.²⁶ Further, as there are no fuel costs associated with generating wind power, this energy can be extraordinarily cheap—some Texas utilities give away their energy for free at night because wind generation is so plentiful.²⁷ These benefits have led to vast investments in wind generation, and in 2017 the sector produced 6.3 percent of the nation's electricity, making it the second most prevalent form of renewable energy, behind hydropower.²⁸

Wind power does come with its drawbacks, however. Turbines can only generate power when the wind is blowing, making wind an unreliable source of baseline power, at least when not connected to an energy storage system.²⁹ Wind farms themselves can be incredibly expensive to build. This is especially true for offshore wind farms,³⁰ which, while popular in Europe, have faced many hurdles to deployment in the United States.³¹ Finally, wind farms often run into local resistance of siting that plagues other large-scale developments.³² While property owners might like cheap, clean energy, many do not like to be able to see where it comes from.³³

Solar power complements wind power, and addresses many of wind's shortcomings. For example, while there have been some utility-scale solar developments in the United States,³⁴ a significant fraction of the industry has comprised of rooftop solar, where homeowners armed with government

26. *Centralized Generation of Electricity and its Impacts on the Environment*, EPA, <https://www.epa.gov/energy/centralized-generation-electricity-and-its-impacts-environment> (last visited Sept. 2, 2018).

27. See Clifford Krauss & Diane Cardwell, *A Texas Utility Offers a Nighttime Special: Free Electricity*, N.Y. TIMES (Nov. 8, 2015), https://www.nytimes.com/2015/11/09/business/energy-environment/a-texas-utility-offers-a-nighttime-special-free-electricity.html?_r=0.

28. *Frequently Asked Questions: What Is U.S. Electricity Generation by Energy Source?*, U.S. ENERGY INFO. ADMIN., <https://www.eia.gov/tools/faqs/faq.php?id=427&t=3> (last updated Mar. 7, 2018).

29. Nic Sharpley, *Unlocking the Potential of Wind Power with Energy Storage*, WINDPOWER ENGINEERING & DEV. (Oct. 3, 2013), <http://www.windpowerengineering.com/design/unlocking-potential-wind-power-energy-storage/>.

30. See, e.g., Mehmet Bilgili et al., *Offshore Wind Power Development in Europe and Its Comparison with Onshore Counterpart*, 15 RENEWABLE & SUSTAINABLE ENERGY REV. 905, 906 (2011), https://ac.els-cdn.com/S1364032110003758/1-s2.0-S1364032110003758-main.pdf?_tid=419a020a-70ad-4cbb-aba6-f6150b09749b&acdnat=1536031593_af1059c706633ddd88b081fec4e8c220.

31. See Eileen McNamara, *What Really Toppled Cape Wind's Plans for Nantucket Sound*, BOS. GLOBE (Jan. 30, 2015), <https://www.bostonglobe.com/magazine/2015/01/30/what-really-toppled-cape-wind-plans-for-nantucket-sound/mGJnwOPbCdfzZHtITxq1aN/story.html>.

32. See *id.*

33. See Eric R.A.N. Smith & Holly Klick, *Explaining NIMBY Opposition to Wind Power 2–3* (unpublished manuscript) (revised version delivered at the annual meeting of the American Political Science Association on Aug. 29, 2007), <http://www.polsci.ucs.edu/faculty/smith/wind.pdf>.

34. See, e.g., Cheryl Katz, *Northern Lights: Large-Scale Solar Power Is Spreading Across the U.S.*, YALE ENV'T 360 (Mar. 23, 2017), <http://e360.yale.edu/features/northern-lights-utility-scale-solar-power-spreading-across-the-us>.

subsidies buy solar panels to power their own properties.³⁵ However, like wind power, solar power is intermittent; photovoltaic cells can only generate electricity when the sun is shining, making solar panels a poor source of baseline power when not connected to an energy storage unit.³⁶ Perhaps more importantly, large numbers of solar panels distributed across thousands of homes offer large, systemic challenges to utilities.³⁷ Most rooftop solar units are subsidized using net metering programs, which allow homeowners to sell the excess power generated by their panels back to the grid.³⁸ This presents a problem, as utilities must service the lines connecting these houses to the grid while collecting very little revenue from them.³⁹ This has caused some industry experts to worry that net metering might lead to a “death spiral” where the costs of maintaining the grid are pushed onto fewer and fewer ratepayers.⁴⁰

Renewable power is an imperfect replacement for fossil fuel generation. However, renewables can offer significant economic benefits to both utilities and ratepayers. Neither wind nor solar require fuel to produce energy, which means that the cost of renewable generation is not dependent on the cost of the underlying fuel. This is especially relevant in colder states where natural gas is an important source of both electricity and home heating, and freezing temperatures drive up demand for both during the winter.⁴¹ Further, renewable energy benefits from generous incentives of both the state and federal level.⁴² While these incentives used to be crucially important for getting renewable

35. See *Solar Industry Data*, SOLAR ENERGY INDUSTRIES ASS’N, <https://www.seia.org/solar-industry-data> (last visited May 14, 2018). However, in the last few years, nonresidential solar installation has outpaced residential solar installation, both in amount of power capacity installed and in percentage of growth in the sector. See *Solar Market Insight Report 2017 Q4*, SOLAR ENERGY INDUSTRIES ASS’N, <https://www.seia.org/research-resources/solar-market-insight-report-2017-q4> (last visited May 14, 2018).

36. See *The Basics of Solar Power*, RGS ENERGY SOLAR CO. (Sept. 16, 2015), <https://rgsenergy.com/how-solar-panels-work/the-basics-of-solar-power>.

37. See Nicholas D. Laws et al., *On the Utility Death Spiral and the Impact of Utility Rate Structures on the Adoption of Residential Solar Photovoltaics and Energy Storage*, 185 APPLIED ENERGY 627, 627 (2017), <https://reader.elsevier.com/reader/sd/DE6C80C974B46E27B2CE562C8AC0CCA4E666456B6DDB1D12033E60032136330AE9200FAFA0E08D675F1FCFD76BC4A8D6>.

38. *Net Metering*, SOLAR ENERGY INDUSTRIES ASS’N, <https://www.seia.org/initiatives/net-metering> (last visited May 14, 2018).

39. See, e.g., Jon Chesto, *Lawmakers Revisit New Solar Power Fee*, BOS. GLOBE (Feb. 1, 2018), <https://www.bostonglobe.com/business/2018/01/31/lawmakers-revisit-new-solar-power-fee/R9Cf8SA0ai3bmFv6FsGpdK/story.html>

40. For an in-depth examination of the net metering “death spiral,” see Nicholas D. Laws et al., *supra* note 37, at 627–28.

41. See Paul J. Hibbard & Todd Schatzki, *The Interdependence of Electricity and Natural Gas: Current Factors and Future Prospects*, 25 ELECTRICITY J. 6, 7 (2012), https://ac.els-cdn.com/S1040619012000899/1-s2.0-S1040619012000899-main.pdf?_tid=9fddc4be-f2d2-4b5a-a980-9f927340426d&acdnat=1536031946_11ac646fdd6901f85c74d89c20224982.

42. See generally Gireesh Shrimali et al., *Wind Energy Deployment in the U.S.: An Empirical Analysis of the Role of Federal and State Policies*, 43 RENEWABLE & SUSTAINABLE ENERGY REV. 796 (2015), https://ac.els-cdn.com/S1364032114010193/1-s2.0-S1364032114010193-main.pdf?_tid=df50ccef-0ba7-46e8-a9d6-a7c4a7d3deaa&acdnat=1536032010_73bea3fec571f6ca8f25d720324db3e1 (examining the effectiveness of national and state-level policies that encourage wind energy development in the U.S.).

energy projects off the ground, the technology has advanced so that in many parts of the country utility-scale renewable projects are cost competitive on their own.⁴³

III. U.S. ENERGY POLICY

American energy policy is a jumbled mix of state and federal law,⁴⁴ developed over time and reflective of changing views of the government's role in the energy sector. It includes massive agencies that are testaments to New Deal-era federal interventions, like the Tennessee Valley Authority, as well as modern, state-led organizations, like the Regional Greenhouse Gas Initiative, which runs a carbon cap-and-trade scheme in the Northeast.⁴⁵ While energy providers across the country have the luxury of selling their power to captive markets, they also have to deal with a constellation of regulators of varying sizes and scopes, who can change the rules at any time.⁴⁶

To make sense of this landscape, it is important to understand how the energy market is structured. Much like other consumer products, energy can be traded on the wholesale market or the retail market.⁴⁷ The wholesale energy market is where utilities buy their power from power plants; the retail market is where ratepayers buy power from the utilities.⁴⁸ Both markets are regulated separately, and the government bodies charged with overseeing them have different goals.⁴⁹

A. The Wholesale Market

The Federal Energy Regulatory Commission (FERC), housed within the Department of Energy, is tasked with ensuring that the wholesale market runs smoothly.⁵⁰ One of its main concerns is that there is enough energy generation to meet demand, and that the markets operate in a fair, nondiscriminatory

43. Diane Cardwell, *Solar and Wind Energy Start to Win on Price vs. Conventional Fuels*, N.Y. TIMES (Nov. 23, 2014), https://www.nytimes.com/2014/11/24/business/energy-environment/solar-and-wind-energy-start-to-win-on-price-vs-conventional-fuels.html?_r=0 (“Those prices were made possible by generous subsidies that could soon diminish or expire, but recent analyses show that even without those subsidies, alternative energies can often compete with traditional sources.”).

44. See Kenneth L. Wiseman et. al., *Electricity Regulation in the United States: Overview*, Thomson Reuters Practical Law (Mar. 1, 2018), [https://content.next.westlaw.com/Document/Ieb49d7b91cb511e38578f7ccc38dcbee/View/FullText.html?contextData=\(sc.Default\)&transitionType=Default&firstPage=true&bhcp=1](https://content.next.westlaw.com/Document/Ieb49d7b91cb511e38578f7ccc38dcbee/View/FullText.html?contextData=(sc.Default)&transitionType=Default&firstPage=true&bhcp=1).

45. *Welcome*, REG'L GREENHOUSE GAS INITIATIVE, www.rggi.org (last visited Sept. 2, 2018).

46. See Wiseman et. al., *supra* note 44.

47. *Id.*

48. *Id.*

49. *Id.*

50. *About FERC*, FED. ENERGY REGULATORY COMM'N, <https://www.ferc.gov/about/about.asp?csrt=4449901153381748325> (last visited Sept. 2, 2018).

manner.⁵¹ Originally, utilities operated every aspect of the energy generation process, from the power plants to the transmission lines to the meters outside of customers' houses.⁵² In the wake of the global oil price spike caused by Iraq's invasion of Kuwait in 1990, Congress passed the Energy Policy Act of 1992, which gave FERC the power to create a wholesale energy market.⁵³ FERC did so in the late 1990s with a series of rules that allowed utilities to spin off their power plants and allow independent electricity providers to sell their power to consumers.⁵⁴ Subsequent FERC rules empowered states to create organizations that oversaw these newly deregulated markets.⁵⁵ These are called Independent Service Operators (ISOs) or Regional Transmission Organizations (RTOs).⁵⁶ Some ISOs only serve one state, such as the California ISO (CAISO), or the Electric Reliability Council of Texas.⁵⁷ Others serve entire regions, like ISO New England, which serves all of New England.⁵⁸ Other regions have decided not to take advantage of the authority granted to them by the FERC rules and do not have an ISO or RTO that handles the planning and oversight of their wholesale energy markets.⁵⁹ In these areas, utilities enter into bilateral contracts with power plants without the oversight of a regional planning body.⁶⁰ Energy sold on the wholesale market that is not controlled by a prior contract with a utility can be bought two ways: through the day-ahead market, where energy for the following day sold, and the real-time market, where energy is bought and sold throughout the day when it will be used.⁶¹ The day-ahead market helps to correct for price volatility by allowing utilities to buy electricity before an

51. FED. ENERGY REGULATORY COMM'N, STRATEGIC PLAN: FY 2014–2018, at 4–5 (2014), <https://www.ferc.gov/about/strat-docs/FY-2014-FY-2018-strat-plan.pdf>.

52. See W.M. WARWICK, A PRIMER ON ELECTRIC UTILITIES, DEREGULATION, AND RESTRUCTURING OF U.S. ELECTRICITY MARKETS 1.1 (rev. 2002), https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-13906.pdf.

53. See Jim Rossi, *The Common Law "Duty to Serve" and Protection of Consumers in an Age of Competitive Retail Public Utility Restructuring*, 51 VAND. L. REV. 1231, 1279 (1998).

54. See Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities, 61 Fed. Reg. 21,540, 21,540 (May 10, 1996) (Fed. Energy Regulatory Comm'n Order No. 888).

55. See Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities, 76 Fed. Reg. 49,842, 49,842 (Aug. 11, 2011) (Fed. Energy Regulatory Comm'n Order No. 1000) (allowing for private development of interstate powerlines); Preventing Undue Discrimination and Preference in Transmission Service, 72 Fed. Reg. 12,266, 12,269–70 (Mar. 15, 2007) (Fed. Energy Regulatory Comm'n Order No. 890) (requiring transmission providers to organize in state-wide or regional groups and to develop energy transmission plans).

56. Regional Transmission Organizations, 65 Fed. Reg. 810, 811 (Jan. 6, 2000) (hereinafter Fed. Energy Regulatory Comm'n Order No. 2000).

57. See *About Us*, CAISO, <http://www.caiso.com/about/Pages/default.aspx> (last visited Sept. 2, 2018); *About ERCOT*, ERCOT, <http://www.ercot.com/about> (last visited Sept. 2, 2018).

58. See *About Us*, ISO-NE, <https://www.iso-ne.com/about> (last visited Sept. 2, 2018).

59. See *About 60% of the U.S. Electric Power Supply Is Managed by RTOs*, U.S. ENERGY INFO. ADMIN. (Apr. 4, 2011), <https://www.eia.gov/todayinenergy/detail.php?id=790>.

60. See *id.*

61. See, e.g., *Day-Ahead and Real-Time Energy Markets*, ISO NEW ENG., <https://www.iso-ne.com/markets-operations/markets/da-rt-energy-markets> (last visited Mar. 11, 2018).

anticipated price spike, and the real-time market allows utilities to correct for any inaccurate energy forecasts.⁶² Roughly two-thirds of the United States' population gets their energy through regulated wholesale markets.⁶³

ISOs and RTOs take a whole host of actions to ensure that consumers have a reliable source of energy, and that they will continue to do so well into the future.⁶⁴ The most common is holding forward-capacity auctions.⁶⁵ These auctions are a planning exercise designed to ensure that there is enough energy being generated to meet future demand—in other words, that the grid has enough generating capacity to ensure that population and economic growth will not lead to blackouts.⁶⁶ The process is relatively straightforward. The ISO, using current demand and growth estimates, predicts how much energy would be required to power the grid at some future point⁶⁷—the New England ISO, for example, makes projections three years into the future.⁶⁸ It then sets a high baseline price, meant to represent what the utilities would pay power plants to generate electricity.⁶⁹ This higher price represents the price at which every power generator capable of powering the regional grid would make a profit.⁷⁰ At each round of the auction, the ISO lowers the price, causing inefficient or expensive power plants to drop out.⁷¹ The auction ends when the energy being profitably generated does not exceed demand.⁷² This price then becomes the baseline price that utilities can charge power plants for their energy in three years.⁷³ Not all ISOs hold these auctions, but all engage in some form of forward planning exercises.⁷⁴

62. *Id.*

63. MATHEW J. MOREY & LAURENCE D. KIRSCH, RETAIL CHOICE IN ELECTRICITY: WHAT HAVE WE LEARNED IN 20 YEARS? 1 (2016), <https://sites.hks.harvard.edu/hepg/Papers/2016/Retail%20Choice%20in%20Electricity%20for%20EMRF%20Final.pdf>.

64. See Federal Energy Regulatory Commission Order No. 2000, *supra* note 56.

65. NE-ISO, NYISO, and PJM all use forward-capacity auctions of some form or another. See C.K. Woo et al., *Merit-Order Effects of Renewable Energy and Price Divergence in California's Day-Ahead and Real-Time Electricity Markets*, 92 ENERGY POL. 299, 300 (2016), https://ac.els-cdn.com/S0301421516300635/1-s2.0-S0301421516300635-main.pdf?_tid=7c9e43cb-e800-4786-b293-b0b1063e87e9&acdnat=1536032873_e0ce4e2a1172f8131a054bf59d8626aa. CAISO joined them in 2016. *Cal-ISO to Start Solicitations for Back-Stop Power Capacity*, S&P GLOBAL PLATTS (Feb. 6, 2015), <https://www.platts.com/latest-news/electric-power/portland-maine/cal-iso-to-start-solicitations-for-back-stop-21961993>. The Electric Reliability Council of Texas has declined to set up a forward capacity market. Woo et al., *supra*, at 300.

66. See Woo et al., *supra* note 65, at 300.

67. *Id.* at 301.

68. *Forward Capacity Market*, ISO NEW ENG., <https://www.iso-ne.com/markets-operations/markets/forward-capacity-market> (last visited Mar. 24, 2018).

69. *Id.*

70. *Id.*

71. *Id.*

72. Adam James, *How a Capacity Market Works*, ENERGY COLLECTIVE (June 14, 2013), <http://www.theenergycollective.com/adamjames/237496/energy-nerd-lunch-break-how-capacity-market-works-and-why-it-matters>.

73. See *Forward Capacity Market*, *supra* note 68.

74. See James, *supra* note 72.

Forward capacity auctions are a crucial planning tool because they allow utilities and power generators to predict their costs and profits years into the future. They also serve as a useful signaling mechanism. High baseline prices set by forward capacity auctions tell energy providers that they could make a profit if they opened another power plant in the region—thereby achieving the ISO’s goal of ensuring the reliability of the grid.⁷⁵

B. The Retail Market

Unlike wholesale energy customers, most retail customers do not have a choice in who they can buy their power from.⁷⁶ In most states, ratepayers are still required to buy their power from utilities that have a regulated monopoly over a certain geographic area.⁷⁷ Therefore, for most Americans, their energy bill is determined by regulatory forces as opposed to the free market.⁷⁸ However, some states do allow what is called “Retail Choice,” where energy providers can compete for customers, as opposed to have their customers chosen for them by geography. Retail Choice is especially popular in the Northeast.⁷⁹ Further, some states draw a distinction between regular household customers and major industrial ones. For example, Georgia only allows Retail Choice for commercial and industrial customers with loads of 900 kilowatts or higher.⁸⁰

In states without Retail Choice, the prices that utilities can charge their customers are regulated by state public utilities commissions. These commissions set the retail prices by engaging in a cost of service analysis, which sets the prices that utilities can charge ratepayers at a certain percentage of the costs the utility bore in procuring the energy.⁸¹ These analyses are conducted in quasi-judicial proceedings in front of the public utility commission called rate cases, designed to provide due process to utilities, investors, and consumers.⁸² In states with Retail Choice the price paid by ratepayers is determined on the free market, although energy providers must still get permission from the relevant state regulators before they can offer their services to the public.⁸³

The operation of the wholesale and retail energy markets do provide transparency in the cost of electricity. However, the separation of the markets makes it very difficult to directly connect the impact of an additional power plant

75. See William W. Hogan, *Electricity Market Design: Energy and Capacity Markets and Resource Adequacy*, EUCI Conference 9 (Sept. 1, 2015), https://sites.hks.harvard.edu/fs/whogan/Hogan_EUCL_090115.pdf.

76. MOREY & KIRSCH, *supra* note 63.

77. *Id.*

78. *See id.*

79. *Id.* at 4 fig.1.

80. *Id.* at 1 n.1.

81. KARL McDERMOTT, COST OF SERVICE REGULATION IN THE INVESTOR-OWNED ELECTRIC UTILITY INDUSTRY: A HISTORY OF ADAPTATION 41 (2012), http://www.ourenergypolicy.org/wp-content/uploads/2012/09/COSR_history_final.pdf.

82. *Id.* at vii–viii.

83. *See id.*

on the rates eventually paid by customers. For example, while forward capacity auctions allow the public to see how building a new wind farm in an area might affect the baseline cost that a utility would pay for the farm's energy, there is no direct way of measuring how that wind farm would affect a family's energy bill.

IV. THE CONSERVATIVE CASE FOR GREEN ENERGY

As the previous subpart shows, the government, on both the state and federal levels, is intimately involved in setting energy prices.⁸⁴ This means that the political ideology of specific lawmakers and regulators at state agencies can have more impact on local energy policy than on the market price of generation. Therefore, many people would expect that Democrats, with their reputation for environmental advocacy and large-scale government intervention, would be more proactive in setting policies that encourage green energy generation and energy efficiency than their Republican counterparts. However, this is not always the case. Many deeply red states, such as Texas and Iowa, have enacted energy policies that are more commonly associated with the Democrats.⁸⁵ Why is this?

Scholars David Hess, Quan Mai, and Kate Brown determined that when stripped of their politically-charged rhetoric, many environmental policies actually fit neatly into a traditional conservative framework.⁸⁶ For example, bills that support energy efficiency, especially in government-owned buildings, fit nicely into an ideological framework that supports lower government costs and taxpayer advocacy.⁸⁷ Similarly, tax credits for solar power generation generally gain support from conservative lawmakers because they result in lower taxes for business, which in turn encourages economic growth.⁸⁸

Hess, Mai, and Brown examined three data sets to back up their assertions.⁸⁹ First, they looked at voting records in all fifty state legislatures on all renewable energy and energy efficiency bills from 2004–2015.⁹⁰ Second, they conducted interviews with state lawmakers, asking them about their support for certain renewable energy policies and the rationales behind them.⁹¹ They also looked at which bills were able to win support, and which ones were not.⁹² The results are illuminating. According to the authors, conservative lawmakers across the country said that “limiting the role of government, limiting government

84. See *supra* Part III.B.

85. See *infra* Part VI.

86. See David J. Hess et al., *Red States, Green Laws: Ideology and Renewable Energy Legislation in the United States*, 11 ENERGY RES. & SOC. SCI. 19, 19–20, 25 (2016), https://ac.els-cdn.com/S221462961530030X/1-s2.0-S221462961530030X-main.pdf?_tid=638dd1fe-e035-4119-94ec-ed79f1870258&acdnat=1536033500_d68afeb5237617030d1462387f9e1333.

87. *Id.* at 25.

88. *Id.*

89. *Id.*

90. *Id.* at 22.

91. *Id.*

92. *Id.*

mandates, reducing regulations, reducing cost burdens on consumers and the private sector, and supporting the needs of the private sector” are important factors that they consider when deciding to support a given bill.⁹³

Just as importantly, appeals to these sorts of rationales can be persuasive, especially in the face of initial conservative opposition. One example comes from the fight to create a Property Assessed Clean Energy (PACE) Program in Colorado, a state that has strong and entrenched Democratic and Republican political constituencies.⁹⁴ PACE programs offer building owners government loans, at a low interest rate, so that they can pay for environmentally-friendly upgrades that promote energy efficiency, renewable energy, or water conservation.⁹⁵ Initially, many conservative lawmakers in Colorado were skeptical of the PACE bill, because it seemed to be a program that increased government intervention in the private sector.⁹⁶ Proponents of the bill overcame this opposition in two ways. First, they amended the bill to account for the concerns of banks, who saw the PACE program as a government push into their line of business.⁹⁷ Second, they framed it as a pro-business bill that allowed business to hedge against the risk of future energy cost increases.⁹⁸ Once this seemingly environmental bill was framed as one that leveled the playing field for private industry, it was able to overcome conservative opposition.⁹⁹

Major renewable energy projects can similarly overcome conservative opposition if they are sold correctly. Advocates should focus on how investing in renewables will save businesses and homeowners money in the long run. Hess and his coauthors have shown that conservative lawmakers care about lowering costs for ratepayers and will even vote for legislation that increases government intervention if it is explained in a pro-business way.¹⁰⁰ The experiences of Texas and Arizona—neither of which can be described as a haven for coastal liberalism—show that renewable energy investments can indeed be good for ratepayers’ bank accounts.¹⁰¹ However, to make the case that renewable energy investments can fit into a traditionally conservative economic mindset, advocates need the data to show that increasing wind and solar power can actually lower rates for citizens and businesses. Luckily, the experience of California shows just that.

93. *Id.* at 25.

94. *Id.*

95. *What is PACE?*, PACENATION, <http://pacenation.us/what-is-pace/> (last visited Mar. 24, 2018).

96. Hess et al., *supra* note 86, at 25.

97. *Id.*

98. *Id.*

99. *Id.*

100. *Id.* at 24–25.

101. *See infra* Part VI.

V. UNDERSTANDING HOW RENEWABLES FIT INTO THE ENERGY GRID:
CALIFORNIA

California deserves its reputation as a national leader in renewable energy. The state legislature has, time and again, passed renewable energy standards that are far more ambitious than ones found in other parts of the country—the latest being Senate Bill 350, which will require state utilities to procure 50 percent of their electricity from renewable sources by 2030.¹⁰² The State's energy sector has done its best to keep up with the Legislature's enthusiasm for renewables. In 2017, 30 percent of the Golden State's power came from renewable sources.¹⁰³ Most of that came from solar and wind, but that number includes hydropower, biogas, and geothermal power as well.¹⁰⁴ For the most part, both the voters and the legislature in California have been convinced by the science of climate change.¹⁰⁵ Therefore, California does not tell us much about the political messaging around renewable energy. However, California experience reveals a lot about the economic effects of a large and diverse renewable energy portfolio.

California is one of three states, along with Texas and New York, that enjoys the benefits of having its own Independent System Operator to run its wholesale energy market, and the California ISO provides public information about the state's energy grid.¹⁰⁶ For example, real time pricing data is published online, allowing both energy industry professionals and researchers to see how wholesale price fluctuates throughout the day at each of the grid's nodes.¹⁰⁷ Despite this transparency, it is still very difficult to find data that connects the wholesale price regulated by the ISO to the retail price paid by the end user.¹⁰⁸ There are many reasons for this. First, the node price measured the cost of all the electricity flowing through that node; if power from both a natural gas plant and a solar plant are coming through the same node, then it is impossible to see which source is driving that price either up or down.¹⁰⁹ Further, despite the robust futures markets for electricity in California, over 90 percent of all the demand in the state is met by power purchase agreements between utilities and

102. S. 350, 2015–16 Leg., Reg. Sess. § 2 (Cal. 2015).

103. CAL. ENERGY COMM'N, RENEWABLE ENERGY—OVERVIEW 1–2 (2017), http://www.energy.ca.gov/renewables/tracking_progress/documents/renewable.pdf.

104. *Id.*

105. David Kordus, *Californians' Views of Climate Change*, PUB. POLICY INSTITUTE OF CAL. (Jan. 2017), <http://www.ppic.org/publication/californians-views-on-climate-change>.

106. See *Regional Transmission Organizations (RTO)/Independent System Operators (ISO)*, FED. ENERGY REGULATORY COMM'N (Oct. 19, 2017), <https://www.ferc.gov/industries/electric/indus-act/rto.asp>.

107. See, e.g., *Market Price Maps*, CAL. ISO, <http://www.caiso.com/pricemap/Pages/default.aspx> (last visited May 14, 2018).

108. *See Id.*

109. *Id.*

generators.¹¹⁰ Accessing these privately negotiated power purchase agreements can often be difficult.

Luckily, some researchers have been able to use California ISO's publicly available information to craft sophisticated models that can measure the effect of individual power sources on the state's wholesale energy price.¹¹¹ The results are encouraging. A team led by Professor Woo of the Hong Kong Institute of Education, in a paper funded in part by the Sacramento Municipal Utility District, found that adding an additional one thousand megawatts of solar power to the grid could lower the wholesale energy price on the day-ahead market up to \$5.30 a megawatt hour.¹¹² A similar increase of wind power could lower the wholesale price up to \$3.40 a megawatt hour, and Southern California could expect to see similar wholesale price decreases with the addition of either wind or solar power.¹¹³

Perhaps the most exciting thing about this study is that, because it is based on observations of energy prices at CAISO nodes, it takes into account the reality of California's energy market as it existed in 2015.¹¹⁴ For example, additional renewable energy resources are predicted to lower the wholesale energy price, despite the downward pressure on prices expected to result from historically low natural gas prices.¹¹⁵ Further, the added wind and solar power would be added on top of the state's preexisting renewable resources.¹¹⁶

Because of the regulations that utilities in California operate under, these wholesale savings should be passed on to retail consumers. Every three years, the major electricity utilities have to undergo a rate case in front of the California Public Utilities Commission, where they justify the rates that they charge their consumers.¹¹⁷ These rates are required to be "just and reasonable,"¹¹⁸ and these charges must be based in part on the cost the utilities bear in procuring this

110. Herman K. Trabish, *How Electricity Gets Bought and Sold in California*, GREENTECH MEDIA (Mar. 29, 2012), <https://www.greentechmedia.com/articles/read/how-electricity-gets-bought-and-sold-in-california#gs.Gvzrmdo>.

111. See, e.g., Woo et al, *supra* note 65.

112. *Id.* at 309.

113. *Id.*

114. *Id.*

115. *Id.* at 310.

116. See *id.* at 301. While the wholesale market predictions Woo makes in his paper are specific to California, he has found reason to predict that additional renewable resources will lower wholesale energy prices in other parts of the country as well, including the Pacific Northwest. See Chi-Keung Woo et al., *The Impact of Wind Generation on Wholesale Electricity Prices in the Hydro-Rich Pacific Northwest*, 28 IEEE TRANSACTIONS ON POWER SYS. 4245, 4250 (2013). Other researchers have seen similar effects in the PJM ISO, which covers much of the Eastern Seaboard in between New Jersey and Virginia, and stretches as far inland as Ohio and Eastern Kentucky. See Hugo A. Gil & Jeremy Lin, *Wind Power and Electricity Prices at the PJM Market*, 28 IEEE TRANSACTIONS ON POWER SYS. 3945, 3952 (2013).

117. CAL. PUB. UTIL. CODE § 728.1(b) (2018).

118. *Id.* § 739(d)(2).

electricity.¹¹⁹ Therefore, by definition, a lowering of the wholesale cost of power generation must be reflected in the rates that consumers pay.

California cannot tell us much about how to sell renewable energy to climate-change skeptics. But the Golden State offers a clear example of how increasing the amount of renewable energy deployed can lower the marginal wholesale price in power, and that this change happens even after a state has installed an impressive amount of renewable power and is benefitting from historically low natural gas prices.¹²⁰ These lessons translate across the United States, regardless of a region's specific geography and energy mix.

VI. CASE STUDIES

While California tells us about the economics of renewable energy, Texas and Arizona tell us far more about how to sell these benefits to conservative political constituencies.

A. Texas

Many people would be surprised that Texas is the nation's leader in onshore wind power, given the Lone Star State's reputation as an oil and gas state. But Texas produces more wind power than any other state in the Union, and more than the next three states combined.¹²¹ The reason why is simple; it makes economic sense to do so.

Texas's large, windy plains make it well suited for wind power.¹²² In fact, some of the country's earliest research into the feasibility of wind power was conducted by researchers at West Texas State University in the 1970s.¹²³ However, the industry only took off after government interventions at both the federal and state levels.¹²⁴ In 1992, Congress passed the first Renewable Energy Production Tax Credit, which was aimed at incentivizing the development of green energy resources.¹²⁵ The credit was only meant to last for ten years, but it has been renewed and expanded many times, most recently in 2015.¹²⁶ On the state level, in 1999 Texas Governor George W. Bush signed the state's first

119. *Id.* § 739.9(e).

120. See Woo et al., *supra* note 65, at 309.

121. Ari Shapiro, *Wind Energy Takes Flight in the Heart of Texas Oil Country*, NPR (Mar. 8, 2017), <http://www.npr.org/2017/03/08/518988840/wind-energy-takes-flight-in-the-heart-of-texas-oil-country>.

122. Jude Clemente, *The Great Texas Wind Power Boom*, FORBES (Oct. 11, 2016), <https://www.forbes.com/sites/judeclemente/2016/10/11/the-great-texas-wind-power-boom/#7b66e50dc6aa>.

123. See *Alternative Energy Institute*, OPENEI, https://openei.org/wiki/Alternative_Energy_Institute (last modified July 16, 2014).

124. See, e.g., *Renewable Energy Production Tax Credit (PTC)*, U.S. DEP'T OF ENERGY, <https://energy.gov/savings/renewable-electricity-production-tax-credit-ptc> (last visited May 14, 2018);

AM. WIND ENERGY ASS'N, *WIND ENERGY IN TEXAS* (2017), <http://awea.files.cms-plus.com/FileDownloads/pdfs/Texas.pdf> (hereinafter AM. WIND ENERGY ASS'N).

125. *Renewable Energy Production Tax Credit (PTC)*, *supra* note 124.

126. *Id.*

Renewable Portfolio Standard, which was amended in 2005.¹²⁷ This legislation set a goal of ten thousand megawatts of renewable energy capacity by 2025, which the state's wind industry surpassed in 2010.¹²⁸

The state government has also been proactive in incentivizing the construction of transmission lines to connect the wind farms in West Texas to major cities like Dallas, Houston, and Austin. Constructing these lines, called the Competitive Renewable Energy Zones (CREZ) transmission project, cost almost \$7 billion and was largely completed by December 2013.¹²⁹ It was paid for by a fee that was levied on every Texan's energy bill.¹³⁰ Governor Rick Perry was a major advocate for the transmission line project and the fee that paid for it.¹³¹ Perry explained his rationale for supporting wind power in the state by explaining that "wind development in Texas was never about climate change—it was about economic development and diversifying our portfolio."¹³²

It is important to note that wind power policies are not universally loved in Texas. For example, CREZ attracted a lot of opposition from the landowners who would have to host the actual transmission lines.¹³³ But these localized complaints could not overcome the tide of positive news stories related to the wind power boom.¹³⁴ For every complaint from a disgruntled landowner, there was a story about school districts getting new football stadiums and academic complexes in West Texas,¹³⁵ or ranchers using rent from wind turbines to supplement their incomes.¹³⁶ As one rancher told NPR, "[f]or a land owner, a ranching family to have . . . the opportunity to have a wind turbine or a solar farm, it may well mean that another generation can remain on the land."¹³⁷ The message that wind power is an unalloyed economic good for Texas has been hard for opponents of the industry to counter. When the small town of Georgetown, Texas signed a deal to be powered almost exclusively by wind power, City Manager Jim Briggs justified the choice in purely economic terms: "We didn't

127. AM. WIND ENERGY ASS'N, *supra* note 124.

128. *Id.*

129. Terrence Henry, *How New Transmission Lines Are Bringing More Wind Power to Texas Cities*, STATEIMPACT (June 26, 2014), <https://stateimpact.npr.org/texas/2014/06/26/how-new-transmission-lines-are-bringing-more-wind-power-to-texas-cities>.

130. *Id.*; *see also* 16 TEX. ADMIN. CODE § 25.174 (2018).

131. Shapiro, *supra* note 121.

132. Jim Malewitz & Kiah Collier, *Rick Perry's Energy Legacy Is More Complicated Than You Think*, TEX. TRIB. (Dec. 13, 2016), <https://www.texastribune.org/2016/12/13/recap-rick-perrys-texas-energy-legacy/>.

133. Kate Galbraith, *Battle Lines: Fighting the Power*, TEX. TRIB. (Sept. 8, 2010), <https://www.texastribune.org/2010/09/08/texas-wind-transmission-project-keeps-rolling-/>.

134. *Id.*

135. *See* Morgan Smith et al., *Wind Farm Money Fuels Spending in West Texas Schools*, TEX. TRIB. (Nov. 11, 2011), <https://www.texastribune.org/library/multimedia/wind-farm-money-spending-schools/>.

136. *See* Shapiro, *supra* note 121.

137. *Id.*

do this to save the world—we did this to get a competitive rate and reduce the risk for our consumers.”¹³⁸

Texas has gained an enormous economic benefit from its investments in wind power—and given the wind resources in Texas, it would have been irresponsible of the Texas legislature to not pursue wind the way that it has. The American Wind Energy Association estimates that the state’s wind sector has created over 22,000 direct and indirect jobs in the state as of 2016.¹³⁹ Further, wind power generators pay over \$60 million a year in lease payments to landowners in West Texas,¹⁴⁰ most of whom are farmers, and some of whom would not be able keep their land without the income from wind turbine leases.¹⁴¹ The wind power industry has also catalyzed the growth of secondary industries.¹⁴² There are now forty manufacturing companies in Texas aimed at servicing the State’s wind power providers.¹⁴³

Just as importantly, the state’s wind power revolution has also been a boon to ordinary ratepayers. To understand why, it is first important to understand the regulatory framework in which Texas’s energy market operates. Texas took advantage of the deregulation of the wholesale energy markets and set up an ISO called the Electric Reliability Council of Texas.¹⁴⁴ The retail market is governed by the Public Utilities Commission of Texas (“Texas PUC”).¹⁴⁵ Texas is a Retail Choice state, and the Texas PUC has instituted many rules to protect customers from high energy bills.¹⁴⁶ These include rules requiring utilities to publicize their rates so that ratepayers are aware of better energy deals,¹⁴⁷ a legislatively mandated code of conduct for utilities and their affiliates,¹⁴⁸ and a law that prohibits unauthorized charges being levied by utilities against ratepayers.¹⁴⁹ But by far the most important of these is the cost of service rule, which, with the exception of a few legislative exemptions like the fee for CREZ, limits the rates to cover only “allowable expenses” incurred by the utility, as well as a “reasonable rate of return.”¹⁵⁰ “Allowable expenses” include taxes levied on the utilities, the costs associated with procuring energy, and the administrative costs

138. Charlie Wood, *Why a Red State Is the No. 1 Wind Energy Producer in America*, CHRISTIAN SCI. MONITOR (Jan. 27, 2017), <https://www.csmonitor.com/Environment/2017/0127/Why-a-red-state-is-the-No.-1-wind-energy-producer-in-America>.

139. AM. WIND ENERGY ASS’N, *supra* note 124.

140. *Id.*

141. *See* Shapiro, *supra* note 121.

142. AM. WIND ENERGY ASS’N, *supra* note 124.

143. *Id.*

144. QUICK FACTS, ERCOT (Aug. 2018), http://www.ercot.com/content/wcm/lists/144926/ERCOT_Quick_Facts_8818.pdf.

145. *About The PUCT*, PUB. UTIL. COMM’N OF TEX., <https://www.puc.texas.gov/agency/about/mission.aspx> (last visited Sept. 2, 2018).

146. *See* 16 TEX. ADMIN CODE § 25 *et seq.*

147. *Id.* § 25.41(k) (2018) (“New Price to Beat” rule).

148. *Id.* § 25.272.

149. *Id.* § 25.481.

150. *Id.* § 25.231.

borne by the utilities such as salaries and pensions.¹⁵¹ Fuel costs, such as the cost of buying coal or natural gas for power plants, can also be included in the “allowable expenses” analysis.¹⁵²

In other words, if the cost of power that the utility pays on the wholesale power market goes down, then Texas law requires that the retail rates the utility charges go down as well. Wind power has already been doing this in the Prairie States—roughly the area from North Dakota down to Oklahoma. According to the Department of Energy’s 2016 Wind Technologies Market Report, the cost to wind power in this region can fall as low as \$20 per megawatt-hour.¹⁵³ This translates to roughly two cents per kilowatt-hour, which is well below the approximately thirteen cents per kilowatt hour that the average American residential customer pays for his or her electricity.¹⁵⁴ Woo, the researcher whose models showed that wind and solar power could lower the marginal wholesale cost of power in California, found similar results when he and his team examined Texas.¹⁵⁵ Woo estimated that an increase of one hundred megawatts of wind power could lower the wholesale energy price by anywhere from \$1.40 per megawatt-hour to \$4.40 per megawatt-hour, depending on where in Texas the power is being sold.¹⁵⁶

The decrease in the wholesale price of power in Texas corresponds with the wind power boom and the completion of the CREZ project, which allowed that power to come to market.¹⁵⁷ The rules and regulations of the Texas PUC explicitly ties the cost of power on the wholesale market to the rates that utilities can charge their customers.¹⁵⁸ The connection is clear. In Texas at least, renewable energy has been a boon to ratepayers, and has made electricity more affordable.¹⁵⁹ This protects ratepayers and lowers the costs of business in the Lone Star state—both of which are stated conservative objectives.¹⁶⁰ However, these sorts of renewable energy success stories would not have been possible if wind power was not sold as a boon to ordinary Texans.¹⁶¹ Framing renewable energy in terms of economic development can be enormously effective in

151. *Id.* § 25.231(b)(1).

152. *See id.* § 25.231(b).

153. U.S. DEP’T OF ENERGY, 2016 WIND TECHNOLOGIES MARKET REPORT 59 (2016), https://energy.gov/sites/prod/files/2017/10/f37/2016_Wind_Technologies_Market_Report_101317.pdf.

154. *Electric Power Monthly*, U.S. ENERGY INFO. ADMIN. (Apr. 24, 2018), https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a.

155. C.K. Woo et al., *The Impact of Wind Generation on the Electricity Spot-Market Price Level and Variance: The Texas Experience*, 39 ENERGY POL. 3939, 3943 (2011), https://ac.els-cdn.com/S0301421511002813/1-s2.0-S0301421511002813-main.pdf?_tid=3289ffd3-2f80-4085-ac0a-7940d6b06a13&acdnat=1536034144_ae7160088219df102099d8c68841b93c.

156. *Id.*

157. *Id.*

158. *See* 16 TEX. ADMIN CODE § 25 *et seq.*

159. *See* Woo et al., *supra* note 155.

160. *See* Hess et al., *supra* note 86, at 25.

161. *See, e.g.,* Shapiro, *supra* note 121.

convincing Republican lawmakers to embrace it.¹⁶² As the next case study shows, even states that have a natural wealth of renewable energy resources might not take full advantage of them if the messaging around the industry is not effective.

B. Arizona

Arizona, like Texas, has an abundance of renewable energy resources—in the words of former governor Janet Napolitano, Arizona’s large tracks of sunny desert could make it the “Persian Gulf of solar energy.”¹⁶³ But while Arizona has become a national leader in utility-scale solar, it has not invested as heavily in renewables as Texas has.¹⁶⁴ Messaging around solar power in the state could help explain why.

Arizona is a relative latecomer to solar power.¹⁶⁵ However, the State under the governorship of Democrat Janet Napolitano made a concerted push to install more solar capacity, spurred in part by a 2007 Arizona Department of Commerce study that found that Arizona could install one thousand megawatts of solar energy by 2020.¹⁶⁶ The years after 2010 saw the development of some of the nation’s largest utility-sized solar power plants in the Grand Canyon State.¹⁶⁷ The Agua Caliente Solar Project was completed in 2014, which produces 290 megawatts of energy, making it the largest solar power plant in North America at the time.¹⁶⁸ Arizona is now home to even bigger solar power plants—the first phase of the Mesquite Solar Project, generating 150 megawatts of power, was completed in 2011, and the plant has been slowly expanded since then, so that it now generates around four hundred megawatts.¹⁶⁹

Despite the size of these plants, Arizona’s citizens do not directly benefit from them because almost all of their power is exported out of the state.¹⁷⁰ For example, Pacific Gas and Electric signed a twenty-five-year contract to buy all of the power from the Agua Caliente plant for the utility’s customers in California.¹⁷¹ Mesquite Solar Project also sells the power from its first unit to

162. Hess et al., *supra* note 86, at 25.

163. Associated Press, *Solar Farm to Rise Over 3 Square Miles in Ariz.*, NBC NEWS (Mar. 7 2008), http://www.nbcnews.com/id/23464740/ns/us_news-environment/t/solar-farm-rise-over-square-miles-ariz/#.We4zVhOPL-Y.

164. ARIZ. DEP’T OF COMMERCE, ARIZONA SOLAR ELECTRIC ROADMAP STUDY: FULL REPORT 25 (2007), https://www.grandcanyontrust.org/sites/default/files/pl_azSolarStudy021307.pdf.

165. *Id.*

166. *Id.*

167. See News Release, NRG, NRG Energy and MidAmerican Solar Complete Agua Caliente, the World’s Largest Fully-Operational Solar Photovoltaic Facility (Apr. 29 2014), <http://investors.nrg.com/phoenix.zhtml?c=121544&p=irol-newsArticle&ID=1923449&highlight>.

168. *Id.*

169. *Industry News: Sempra Announces Expansion Plans for Mesquite Solar Complex in Arizona*, LCG CONSULTING (Sept. 16, 2015), http://www.energyonline.com/Industry/News.aspx?NewsID=7825&Sempra_Announces_Expansion_Plans_for_Mesquite_Solar_Complex_in_Arizona.

170. See, e.g., News Release, NRG, *supra* note 167.

171. *Id.*

Pacific Gas and Electric, and sells the power from its second unit to Southern California Edison, another large California utility.¹⁷² The expansion of Mesquite will not benefit Arizonans either—the electricity from the third unit, which was completed in 2016,¹⁷³ is sold to the United States Army and Navy to power bases in California.¹⁷⁴

The savings Arizona ratepayers are missing out on might well be significant. While the cost of power agreed on in the Agua Caliente and Mesquite contracts is not publicly available, a recently finished one-hundred megawatt solar plant in Arizona agreed to sell its power to the utility Tucson Electric Power for less than three cents per kilowatt hour.¹⁷⁵ To put this into perspective, the average American ratepayer pays around thirteen cents per kilowatt-hour for their electricity.¹⁷⁶ These energy savings would be passed on to Arizona customers by the normal operation of the state's energy market.

The Grand Canyon State's wholesale power market does not enjoy the benefit of an ISO or RTO—in fact, many Arizona utilities own much of the power stations generating electricity for the state¹⁷⁷—but the wholesale cost of energy that utilities pay is still an important component of the rates charged on the retail market.¹⁷⁸ Retail energy costs charged by utilities have to be approved by the Arizona Corporation Commission, the body that regulates the state's power section, during a quasi-judicial rate case.¹⁷⁹ The rates charged by utilities are required to be “just and reasonable,”¹⁸⁰ and the Commission is required by statute to use the competitive market to determine what would be a “just and reasonable” rate.¹⁸¹ Further, any rate increase requested by a utility has to be based in part on a cost of service analysis.¹⁸² Therefore, just as in Texas, an influx of cheap renewables would put downward pressure on the rates that utilities could charge their customers by law. Even without an ISO or an RTO, the market

172. *Industry News: Sempra Announces Expansion Plans for Mesquite Solar Complex in Arizona*, *supra* note 169.

173. *Solar 1 in Operation: Mesquite Solar 3*, SEMPRA RENEWABLES, <http://www.semprarenewables.com/project/mesquite-solar-3/> (last visited May 14, 2018).

174. *Id.*

175. Joe Romm, *Arizona Utility Signs Game-Changing Deal Cutting Solar Power Prices in Half*, THINK PROGRESS (May 23, 2017), <https://thinkprogress.org/arizona-utility-game-changing-solar-deal-8e7c0bcb093a/>.

176. *Id.*

177. See *General Electric Information*, ARIZ. CORP. COMMISSION, http://www.azcc.gov/divisions/utilities/electric/gen_info.asp (last visited Mar. 28, 2018).

178. See *Electric Power Markets: Southwest*, FED. ENERGY REGULATORY COMM'N, <https://www.ferc.gov/market-oversight/mkt-electric/southwest.asp> (last updated Mar. 10, 2016); Elise Caplan, *How Wholesale Markets Affect Retail Rates*, AM. PUB. POWER ASS'N (Jan. 5, 2018), <https://www.publicpower.org/periodical/article/how-wholesale-markets-affect-retail-rates>.

179. ARIZ. ADMIN. CODE § R14-2-103 (2018).

180. ARIZ. REV. STAT. ANN. § 40-361 (2018).

181. *Id.* § 40-202(D).

182. ARIZ. ADMIN. CODE § R14-2-103(G).

does not present an obstacle to increased solar generation and a corresponding drop in retail electricity prices.

As the Grand Canyon State's experience with net metering shows, the barrier to installation is political, not economic. In 2009, Arizona created a net metering program to encourage homeowners to install solar panels on their roofs.¹⁸³ Initially, the program did not have a cap on the amount of energy that a user could install, so long as it was less than 125 percent of the total amount of energy used by the customer.¹⁸⁴ This changed after intense industry pressure in 2013, when the Arizona Corporation Commission voted to levy a roughly five-dollar-a-month fee on net metering customers.¹⁸⁵ In 2016, the Corporation Commission voted to scrap net metering entirely and replace it with a much less generous "net billing" scheme, which limits the amount of money residents can get from their panels and locks in the rates utilities have to pay them.¹⁸⁶

All of these changes were pushed through after aggressive lobbying by Arizona's utility companies, who see net metering as an unfair cost shift onto the utilities themselves and the customers who have not installed solar panels.¹⁸⁷ A spokesman for the Arizona Public Service Company, one of the state's largest utilities, went so far as to say that a proposed ballot initiative to preserve net metering was "a ridiculous attempt by California billionaires to get richer by forcing higher energy costs on Arizona consumers."¹⁸⁸ Many members of the Arizona Corporation Commission clearly seemed to find this sort of argument

183. ASU ENERGY POLICY INNOVATION COUNCIL, ARIZONA NET METERING RULES BRIEF SHEET (2013), https://energypolicy.asu.edu/wp-content/uploads/2014/01/Policies-to-Know-Arizona-Net-Metering-Rules-Brief-Sheet_Updated.pdf.

184. *Id.*

185. *Id.*

186. Julia Pyper, *Arizona Vote Puts an End to Net Metering for Solar Customers*, GREENTECH MEDIA (Dec. 21, 2016), <https://www.greentechmedia.com/articles/read/arizona-vote-puts-an-end-to-net-metering-for-solar-customers#gs.vi2=yu8>; See *Net Billing*, DEP'T OF ENERGY, <https://www.energy.gov/savings/net-billing> (last visited May 14, 2018).

187. Herman K. Trabish, *The Lurking Surprise for Solar in Arizona's Recent Ruling to End Net Metering*, UTIL. DIVE (Jan. 26, 2017), <http://www.utilitydive.com/news/the-lurking-surprise-for-solar-in-arizonas-recent-ruling-to-end-net-meteri/433555/>. Despite the utilities' push to limit net metering, they have a willingness to experiment with distributed solar, so long as they control the panels. In 2015, both Tucson Electric Power and Arizona Public Service began pilot programs where they installed solar panels on customers' roofs and "rented" the space with either free energy or an energy credit on the customer's bill. Herman K. Trabish, *Arizona's Utility-Owned Solar Programs: The New Business Models Utilities Are Looking for?*, UTIL. DIVE (Jan. 7, 2015), <http://www.utilitydive.com/news/arizonas-utility-owned-solar-programs-the-new-business-models-utilities-a/348331/>. By allowing the utilities to control the flow of the power from these panels, these programs offer many of the benefits of net metering without some of the drawbacks to utilities, such as cost shifting. *Id.* Both programs are currently full and are no longer accepting new customers. *Solar Partner Program*, APS, <https://www.aps.com/en/ourcompany/aboutus/investmentinrenewableenergy/Pages/solar-partner.aspx?src=solarpartner> (last visited Apr. 2, 2018); *TEP Residential Solar Program*, TUCSON ELEC. POWER, <https://www.tep.com/residential-solar/> (last visited May 14, 2018).

188. Ryan Randazzo, *Arizona Solar Ballot Initiative Launched by Super PAC*, ARIZ. REPUBLIC (Apr. 15, 2016), <http://www.azcentral.com/story/money/business/energy/2016/04/15/arizona-solar-energy-ballot-initiative/83088390/>.

persuasive. The Commission, all of whose commissioners are elected and all of whom were Republicans in 2016,¹⁸⁹ voted four to one to repeal net metering.¹⁹⁰ As net metering programs provides a direct economic benefit to homeowners, one might assume that there would be a powerful, politically compelling reason for the elected members of the Commission to support it. The fact that they did not, in a near unanimous vote, shows the power of the utilities' argument absent a clear and convincing economic counter narrative.

Much of the rhetorical strength of the utilities' argument came from the idea that solar power raises the cost of energy for everyday Arizonans.¹⁹¹ Tuscon Electric Power's ability to buy new utility solar power for three cents per kilowatt hour shows that that is simply not true,¹⁹² but because almost all of Arizona's solar power is exported out of state, Arizona voters do not see that reflected on their electricity bills. Had that not been the case, the utilities' argument would have been much less convincing.

As Arizona's experience makes clear, an abundance of renewable resources does not necessarily mean that a state will embrace them wholeheartedly. It also shows the importance of messaging in convincing rule makers and legislators to pursue green energy. Utility companies were able to tar net metering as benefitting "California billionaires" more than ordinary Arizonan's because, in large part, regular ratepayers do not enjoy any of the benefits of the industry.¹⁹³ Had more of the power from Arizona's utility-grade solar plants been sold into the Arizona grid and by action of the market lowered Arizonan's energy bills, solar energy advocates would likely have had an easier time countering the utilities' argument.

CONCLUSION

Environmental activists have done an extraordinary job using science to convince approximately half of the country of the dangers of climate change, and of pushing policies that frame renewable energy as a way to fight that threat. Now, with President Donald Trump in the White House and the United States withdrawing from the Paris Climate Accord, I hope these same activists realize that everyone who found these arguments convincing has already been

189. Nate Airulla, *Republicans Take Hold of Arizona Corporation Commission in Close Race*, DAILY WILDCAT (Nov. 9, 2016), <http://www.wildcat.arizona.edu/article/2016/11/republicans-lead-arizona-corporation-commission-race-too-close-to-call>.

190. Pyper, *supra* note 186. It is also worth noting that the FBI is investigating spending by the Arizona Public Service Company in support of the candidacies of two utility-friendly commissioners on the Arizona Corporation Commission in 2014. Ryan Randazzo, *Advocacy Group Briefs FBI in Arizona Corporation Commission Inquiry*, ARIZ. REPUBLIC (July 6, 2016), <http://www.azcentral.com/story/money/business/energy/2016/07/06/fbi-questions-clean-energy-advocacy-group-az-corporation-commission-inquiry/86757378/>.

191. See Randazzo, *supra* note 188.

192. See Romm, *supra* note 175.

193. See Randazzo, *supra* note 188.

convinced. The next stage of environmentalists' work has begun—proving to the rest of the country that embracing renewable energy will create jobs and save them money.

This argument is not disingenuous. States as diverse as California and Texas show us that renewable energy costs lower wholesale power prices, and the regulatory framework that governs the industry provides a way of translating these lower wholesale prices to retail price saving that normal citizens can enjoy. Activists should not pretend that renewable energy does not have an environmental justification. However, if your audience thinks that economic arguments are more convincing than environmental ones, it makes sense to focus on economic case for wind and solar power. Maybe in the future, the national debate around climate change will return to one based on shared consensus of the scientific facts. Until that time, a great deal of progress can be made if the debate is focused instead on the green that renewables can put back into people's wallets.

We welcome responses to this Note. If you are interested in submitting a response for our online journal, *Ecology Law Currents*, please contact cse.elq@law.berkeley.edu. Responses to articles may be viewed at our website, <http://www.ecologylawquarterly.org>.